Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IODE Steering Group for the Ocean InfoHub Project

Report

Fourth Session (Hybrid)
4-5 October 2023

4-5 October 2023
English only

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Table of contents

1. Introduction

The Fourth Session of the IODE Steering Group for the Ocean InfoHub Project was convened on 4-5 October 2023 at 10:30. A hybrid format was chosen to facilitate maximum participation of Steering Group members. Background documents were prepared and shared with all Steering Group meeting participants in advance of the meeting.

OE event link: https://oceanexpert.org/event/3929

The purpose of the meeting was to provide a comprehensive overview of progress on the work plan over the past 12 months, and to get feedback on plans for the remaining eight months of the project. All workshop materials will be permanently located at the Ocean Expert link provided above.

2. Opening of the meeting

Opening of the meeting (Mr Vladimir Ryabinin (recorded) and Mr Gert Verreet).

Dr Ryabinin welcomed colleagues to the start of the Ocean InfoHub meeting. He mentioned the upcoming UNESCO executive board which would discuss considerable budget increases for IOC. This increase would benefit IODE and will include an additional professional position in Oostende. Regarding OIH, Dr Ryabinin shared some observations. He referred to sustainable ocean planning (SOP) requiring an authoritative data flow. So OIH is an important project providing infrastructure for timely delivery of data. But we also need to make sure our voice is heard internationally. In this regard he referred to the 2025 Nice Conference where ocean data should be visible. The Decade is helping us to mobilize communities. He thanked the Government of Flanders for its support, and for creating this science policy interface and wished all a successful meeting.

Mr Verreet addressed the meeting. He welcomed participants to Belgium and Flanders and the new INNOVOCEAN campus, the new home of VLIZ, ILVO and international partners such as IODE. He also welcomed the data hub that is being developed through OIH. He noted a rapid increase in interest in how data can serve marine applications. OIH is in the forefront of “open data”. There are many synergies between IODE and the European context: AI, digital twins, but we should remember that when data is generated it should be made accessible. OIH is therefore an important initiative. He also echoed Dr Ryabinin’s words regarding the June 2023 Assembly and was pleased to see that IOC member states prioritized the work of IODE, GOOS, CD and RSBs. OIH and ODIS is an investment in infrastructure and capacity for the long term. It needs to be nurtured through the IOC resources. What OIH is delivering is coming at the right moment and the additional resources are timely. OIH has been supported by FUST. The trust fund arrangement started 25 years ago in cycles of 5 years and this is the end of the 5th cycle. The trust fund recently underwent an evaluation and the results of the evaluation were quite positive so we are hopeful for the agreement to continue. Mr Verreet wishes the group every success for a fruitful meeting.

3. Administrative arrangements

Ms Sofie De Baenst shared some logistical and administrative information.

4. Adoption of the Agenda

Mr Harrison Ong’Anda (SG-OIH Chair) presented the draft agenda which was adopted with no changes.

5. Overview of the OIH work plan and deliverables

A presentation was made by Ms Lucy Scott and the OIH team, covering the deliverables to date and the upcoming work plans for the five work packages. The work plan is on track with no major technical delays. A no-cost extension has been granted for the project to run until June 2024; this has been factored in to the work programme.

In reaching our milestones, grateful thanks are due to the IODE PO team, funder (Government of Flanders, Kingdom of Belgium), WP2 secretariat and contractors, WP2 working group, three regional coordination teams (Africa, LAC and PSIDS), implementation partners and other project partners.

Ocean InfoHub Project highlights: past 12 months

1. Three active communities of practice (Africa, PSIDS, LAC)
2. Technical working group active, and two subcontractors renewed
3. 25 partner organisations (representing 32 nodes) currently indexed
4. Documentation and resources continue to grow
5. Initiated a getting started toolkit
6. End-user feedback collected on the Global Search Hub
7. Front end Global Search Hub contract (II) just started
8. Plans in place for expanding end-user engagement, particularly in regions
9. A total of 98 organisations engaged and/or in the co-design process
10. Animated video, brochure and other materials disseminated widely
11. Four more training courses held (EN, SP, FR, PT) in 2023

The OIH Project has 5 work packages:

WP1: Project management, coordination and evaluation
WP2: Technology development
WP3: Establishment and initial support the global hub and regional nodes
WP4: Training and capacity development of regional nodes
WP5: Communication, user marketing and feedback

Ms Scott gave an overview of the timeline to date and the current status of the implementation of ODIS. This was followed by a detailed report on each of the work packages.
Ms Scott recalled that the previous meeting had still been held in the previous building.

Partners currently indexed by ODIS/OIH

Strait of Georgia Data Centre	Peace Boat US	POLDER	South African Institute for Aquatic Biodiversity (SAIAB)	Anthropocene Institute	IDEM-DHN Brazil	SDG Federated Data System
Protected planet	NOAA OneStop	OpenOceanCloud	Marine Information Management System (MIMS)	NOAA / Open-GTS / GOOS Observations Coordination Group	Global fishing watch	Hakai Institute
MarCOSIO (formerly MarCoSouth)	Aquatic Sciences and Fisheries Abstracts (ASFA) + FAO	MEDIN (Marine Environmental Data and Information Network)	Research Data Australia	Better Biomolecular Ocean Practices (BeBOP) as part of Ocean Biomolecular Observing Network (OBON)	Population Health domain (cross-domain interoperability)	IOOS
CCLME Eco-viewer	Blue Planet / BIOPAMA (RCMRD)	EMODnet	CLME+ training portal	OBIS	WIO Symphony project	DOOS (Deep Ocean Observing Strategy)
OBON (Ocean Biomolecular Observing Network)	Leibniz Center for Tropical Marine Research (ZMT)	EUROCEAN	SeaDatanet	Caribbean Marine Atlas	ICAN	Digital Earth Africa
IUCN (International Union for Conservation of Nature)	GEO Bon-in-a-box	INVEMAR (LAC regional portal)	OceanScape Project	CORDIO / MASPAWIO	World Environment Situation Room (WESR)	PICES
Nairobi Convention (clearinghouse)	Heimholtz (PLB)	BCC data portal (Benguela Current Commission)	Flanders Marine Institute (VLIZ)	Aquadocs	Copernicus Marine Environment Monitoring Service (CMEMS)	HUB Ocean
DITTO	IW_Learn 5	Canadian Integrated Ocean Observing System	Indonesian NODC	Sargassum Hub	Foundation for Industrial and Technical Research (SINTEF)	BCO-DMO (Biological & Chemical Oceanography Data Management Office)
Argentina, NODC	CODATA	OBPS	Marinetraining.eu	SPC (Pacific Data hub)	Australian Ocean Data Network (AODN)	Mozambique Oceanographic Institute
Colombia DIMAR NODC	GEMS Ocean (UNEP)	OceanExpert	IOC/Africa data portal	SPREP (Pacific Environment Data Portal)	Integrated Marine Observing System (IMOS)	Global Platform for Marine Litter (GPML)
Colombia National Natural Parks	MSP project IOC	METS RCN - Research Coordination Network for Marine Ecological Time Series	National Marine Data and Information Service (NMDIS) - China	World Ocean Database	UNESCO Convention on the Protection of the Underwater Cultural Heritage	Plastic-i
UNEP (UN Environment Programme)	Marine debris data harmonization workshop (WS) Japan	British Oceanographic Data Centre (BODC)	Belgian Marine Data Centre (BMDC)	El Salvador Ministry of Environment	IOCARIBE catalogue	SOCIB - Balearic Islands Coastal Observing and Forecasting System
Tsunami	INCOIS	SARGASSUM Hub	Marine Institute Data Catalogue	SCOR	Permanent Commission of the South East Pacific (CPPS)	Virtual Institute for the Sustainable Development (IVIDES.org)
University of California San Diego, SCRIPPS	GEBCO Seabed 2030	Ocean Acidification (OA) UNESCO	MARISMA			

Ocean InfoHub Project Monitoring and Indicators

PI 1. Number of ocean products (e.g. policies, MSP, coastal zone management plan, legislation...) developed nationally that used the Ocean InfoHub data/information, disaggregated by country and type of product	10	0	Not measured yet, but dedicated tasks to do this in PSIDS and Africa
PI 1. Number of content items shared through the system	1000	0	Over 100,000 content items
PI 2. Number of Ocean InfoHub users which have reported collaborative initiatives stimulated by their use of the system	10	0	Not reported yet, but in progress in all three regions.
PI 1. Number of ODIS integrated products/services developed	5	0	25 nodes, 32 services (eg. INVEMAR has 5 services)
PI 2. Usage of the ODIS (volume of content downloaded, number of ODIS resources visited (e.g. redirect from ODIS) [Number of records: redirect from OIH]	1000 items/year/node downloaded	0	949 Searches; 467 redirects to a link to download since 11 April 2023 (6mo)

PI 1. Number of nodes participating in the Ocean InfoHub	4	0	25 nodes active, 98 partners engaged
PI 1. Number of trainees trained in content submission	100	0	Training courses: 16 completed 2021, 81 across English, Spanish, Portuguese, French in 2023, bilateral capacity development ongoing with >90 partners
PI 1. Number of data/information providers contributing content	50	0	Hundreds of providers are providing content via nodes (regional LAC search for dataset search returns 99 providers)
PI2. Number of unique users consulting the system	1000/year	0	7970 users since November 2022
Additional targets			
Global and regional nodes OIH	10000 content items	0	>100,000 content items

5.1 Work package 1: Project management, coordination and evaluation

This work package covers activities related to:

- overarching coordination and guidance
- planning and budget management
- monitoring and reporting
- risk and issue management
- project evaluation.

The role of the Steering Group is to:

- monitor and guide the implementation of the Ocean InfoHub
- propose remedial action where necessary
- advise the Project Manager
- ensure that the project serves user/region needs
- identify new opportunities and adjust the work plan according to changing needs and circumstances
- prepare annual progress reports

Table 1. Work Package 1 overview of timeline

Timeline and Activities	Year 3 (2022)				YEAR 4 (2023)				YEAR 5 (2024)	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun
WP1: Project Management and Coordination										
1.1 Project manager	X	X	X	X	X	X	X	X	X	X
Monthly reports	X	X	X	X	X	X	X	X	X	X
Annual report (D1.1)				X				X		
1.2 Admin assistant (50%)	X	X	X	X	X	X	X	X	X	X
1.3 Steering Group meetings			X(h)					X(h)		
Email the steering group, update	X	X				X				
Set a date for a virtual SG meeting, draft the agenda	X	X				X				
SG meeting report				X				X		
1.4 External evaluation					X					
Evaluation report (D1.2)										
1.5 Project wrap-up meeting										X
Final report (D1.3)										X

5.1.1 Deliverables September 2022 – September 2023

1. Tracking sheet for all project deliverables maintained and monthly reports written. (Reference doc 1. OIH Project Timeline and Deliverables).

2. Steering Group meeting convened

3. General administration tasks (project management tools, calendars integrated, dropbox, Gdrive, IODE / IOC meetings and ad hoc UNESCO meetings).

5.1.2 Objectives October 2023 – June 2024

1. Tracking sheet for all project deliverables maintained and monthly reports written

2. Final project meeting planned and final project report written.

3. General administration tasks continued

5.1.3 External Evaluation of the Flanders/UNESCO Trust Fund for the Support of UNESCO's Activities in the Field of Science (Lucy Scott)

Numbering under this section follows the evaluation report

4.1 Relevance
Survey findings of all FUST projects:

- (94%) agreed that the projects they were involved in placed a **high emphasis on using scientific and science-based activities** as effective enablers of addressing environmental challenges.
- (97%) concurred that the **thematic focus** of the FUST projects aligned well with the needs and priorities, including Sustainable Development Goals, of their countries as well as their regions
- goals and objectives of FUST projects were **in alignment with their development priorities** at the national (96%) and basin scale (local) levels (93%).

Stakeholders of **OIH** affirmed the relevance of the project highlighting the importance of the establishment of regional nodes in Latin America, Africa, and the Pacific.

- project design process was **participatory and comprehensive**
- the project **responds to the imperative for access to oceanic data and provides a more globally inclusive solution**.
- The **technical design considerations of OIH were positively assessed** by the stakeholders and aspects related to data interoperability and data exchange were considered of **high relevance** for the activities of the beneficiaries.

4.3.3 Effectiveness of implementation
A detailed analysis of the findings indicated that risk management practices were positively assessed by all respondents for OIH and PacMAN.
for OIH, all (100%) of respondents agreed that implementation was **flexible and adaptive**

4.3.4 Equality and inclusion
The overarching goal of the OIH project is to facilitate equal access to data by everyone. As such, the inclusion dimension was **embedded in the project design**. To achieve this goal, OIH emphasised the sharing of data on various factors, such as economic activities and the welfare of coastal communities. Furthermore, training activities implemented by OIH were conducted in line with the **OTGA** Course Management Guidelines which target equal participation of women.

4.3.5 Resource efficiency
OIH used its resources efficiently in spite of the delays in project implementation. According to the stakeholders, it **built on existing initiatives** as well as data hubs instead of creating a new database, an approach that contributed to efficiency. The project also established partnerships that helped effective use of resources.
4.3.6 Inter-sectoral and project level collaborations
In OIH, **private enterprises** have started to communicate with the ocean science community to explore commercial opportunities. Stakeholders believed that there were opportunities to work with them, for instance, by expanding OIH with collected data that is not proprietary or confidential, as well as integrating catalogues of private sector sensors, technologies, and services.
According to the stakeholders, OIH and ODIS could play a role in facilitating data sharing and supporting the ocean environment from a philanthropic point of view.

4.3.8 Challenges faced in the implementation
In OIH, the **challenge of duplication** while consolidating data from multiple sources was a persistent issue that needed constant attention throughout the project lifecycle. While the first version of OIH addressed this as effectively as possible, there is still room for improvement.

Coordinating a global project, particularly with regional nodes, posed significant complexities for the team. However, this challenge was managed through **effective communication**.

- From the **private sector, two challenges** persist, both related to data provision: 1) legal concerns regarding the potential misuse of data, requiring the establishment of contractual terms for data sharing; 2) a need for a system that interprets data formats, metadata, and terminologies used in the private sector into a format that is readily understandable and accessible in public sector.
- For the **beneficiaries of the capacity-building** activities of OIH, the provided content was highly specialised and predominantly tailored to experts, limiting its practicality for audiences from both the private and public sectors. There was a suggestion to use more real-life examples.

4.3.11 Involvement of Flemish scientific community

- In the case of OIH, stakeholders believed that collaboration could be enhanced around the theme of **open science**, since Flanders is very strong in adopting and promoting the concept.
- In OIH, one survey participant expressed that the **linkages with VLIZ** have been essential in promoting oceanographic data and information management.
- Another respondent stated that the continued support from **VLIZ** was key for the success of the project. One of the OIH stakeholders explained that leveraging new linkages established was important to bring expertise, resources, and collaboration opportunities to enhance the project's impact, credibility and relevance within the scientific community in the Western Indian Ocean, especially on data management.

4.4.1 Signs of impact

According to the stakeholders, OIH exceeded its targets in all aspects, including partners, interoperability, and content items shared.
It contains over 3,000 records (*100,000), allowing users to search across multiple organisations and data repositories. Currently, 19 partners are indexed, with an initial objective of only four. The system involves around 100,000 content items, including 24,000 experts, 13,000 institutions, 42,000 documents, 19,000 training courses, 238 vessels, 3,000 projects, 5,000 data sets, and 8,000 spatial data records. The stakeholders believed that OIH's features and outputs would **create desired impacts and become sustainable**.

4.4.2 Key enablers of success

In the case of OIH, the **architecture and technological features of the system, its geographic and thematic coverage, as well as its open access nature** were recognised as the main success factors. Also:

- the project's approach to data, which includes redirecting users to the **original** source rather than harvesting data, is considered as vital
- the system's ability to search for **specific information** and provide pertinent results, such as data on mangroves in Mozambique
- provision for both **existing and potential partners** to access open resources online at any time, even without detailed knowledge of OIH

The inclusion of ODIS specifications is believed to **further boost organizations' discoverability** through prominent data search engines like Google Dataset Search, thus elevating their visibility. Lastly, the attractive architecture, featuring mature data management practices, has been perceived positively by data organizations, consolidating OIH's position in the field.

4.4.3 Longer-term effects of the projects

In OIH, the anticipated long-term effects were expressed as **mutual learning** with partners and advancement of data management practices.

- The OIH project has been instrumental in establishing the concept of **FAIR data** within private sector organisations, changing the way they view and handle data internally.

- Continuous **exchanges and collaborations** (e.g. between OIH and WMO) are expected to lead to a more efficient sharing of experiences and concurrent development of technologies such as ODIS and WMO Information Systems 2.0.
- According to stakeholders, the long-term effects of the project are expected to be **enhanced interoperability and the development of convergent technology**, both of which are highlighted by the ongoing exchange of advancements in ocean data and information systems. It was also explained that for increased outreach and impact, OIH should put focus on **user engagement and communication** and promote the rich sources of information it provides.

4.4.4 Sustainability and scalability

Recommended that FUST mandate project outputs stay functional and operational for a period of three to four years after the end of the project, without necessitating additional funding.
IODE was already working on, for example, the hosting of the platform. However, a clear framework and organisational aspects should be put in place and **commitment from partners** should be achieved by communicating with them the benefits and positive effects of the project and the importance of their continued involvement in its development
The system has been designed to **dynamically accommodate changes**, such as the addition or withdrawal of a data partner, without the need for manual intervention.
The aim is for the platform to **continually grow as a digital ecosystem**. For those who are to be added, the system provides technical guides and examples.

Another area of improvement on the platform could be allowing researchers to share **publications and research reports** to turn it into a knowledge hub
Ocean Data 2030 is expected to contribute to the sustainability of the system.
Some stakeholders stated that OIH was not presented as a priority within the Ocean Decade despite the IOC's position as the lead agency, and this could have a negative effect on its impact and sustainability. Nevertheless, a strategic opportunity for OIH's sustainability was explained as a key role it could play within the anticipated **Ocean Decade coordination office for data sharing**, which is likely to be hosted by IODE [*Note: This review was written before the confirmation of the DCO at IODE*]. This possibility could position OIH strategically by giving it the opportunity to support the UN organisations and Member States in the Decade

According to interviews, one potential area for increased impact and sustainability involves transforming raw data into **actionable knowledge** via business intelligence, which could help policy-makers take informed decisions. It was also added that the application of artificial intelligence could uncover hidden patterns and insights related to data, further highlighting potential gaps and areas for development.
Stakeholders suggested that the scope of OIH could be broadened by involving **more systems, organisations, nodes and regions**. They stated that the OIH could collaborate with **oceanographic and polar** data communities to enhance sustainability as these communities share similar challenges, are informally organised through various initiatives and use **similar technological frameworks**.

Questions and discussion

Mr Verreet provided some comments on the evaluation. He recalled that a pre-evaluation/self-evaluation had been implemented prior to the official evaluation. Many people from the OIH community had participated and they also responded to questions from the evaluators. He referred to a particular evaluation: as this is an infrastructure the evaluators recommended that for this kind of project the thinking should not only be for the lifetime of the project but an outcome should be how the infrastructure should be institutionally embedded after the project.
Mr Verreet noted the considerable budget increase which could assist with this.

Mr Pissierssens explained the restructuring of IODE including 3 programme components (OBIS, ODIS and OTGA). This would allow the creation of a solid foundation with substantive budget allocations.

5.1.4 Budget

Significant cost savings were made during 2021 and 2022 due to the travel restrictions imposed as a result of the global COVID-19 pandemic. A balance was found between additional spending (on consultancies, for example), while still retaining reserves to enable travel when permitted.

Costs to be spent for the remainder of 2023 and to June 2024 include:

- Two contracts for the ongoing development of the ODIS-architecture.
- Co-financing of PSIDs regional activities
- Co-financing of activities at the IOC Sub-Commission for Africa
- Co-financing of activities in the LAC region
- Further development of the Global Search Hub based on end-user feedback
- Ocean Decade Conference 2024
- SG-OIH-Final meeting 2024 (hybrid or virtual TBC)

Co-financing received

2020-2021 NORAD
African database of training opportunities: There was no single database or portal for marine and coastal training opportunities for Africa, training opportunities and resources were sourced from numerous distributed resources. The Africa Marine training Database has been successfully developed and populated with training course records. The portal is online at: http://africa.marinetraining.org/ and provides ocean professionals with direct information on training opportunities. Records are discoverable through the OIH Global Hub

The database continues to be updated in 2023.

2021-2022 NORAD
Establishment of new nodes in the Ocean Data and Information System: our two contractors continue to work with partners in all regions and bring new nodes into the system.

Questions and discussion

No questions

5.2 Work package 2: Technology development

This work package covers the technical developments needed to support the implementation of Ocean InfoHub nodes and the proof-of-concept ODIS reference architecture which will allow the nodes to interoperate with each other and external systems.

In terms of Ocean InfoHub development, this work includes:

- development of a Global Hub
- development of Regional/Thematic Node application (Virtual nodes part of the Global Hub or as separate regional/thematic nodes)
- continued population of ODISCat

Table 2. Work Package 2 overview of timeline

Timeline and Activities	Year 3 (2022)				YEAR 4 (2023)				YEAR 5 (2024)	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun
2.1 Global Hub Development										
Global hub technology framework developed (D2.1)	X	X	X	X	X	X	X	X	X	X
Regional node technology developed (D2.2)	X	X	X	X	X	X	X	X	X	X
2.2 Further development of ODISCat	X	X	X	X	X	X	X	X	X	X
Regional communities and global partners contribute to ODIScat	X	X	X	X	X	X	X	X	X	X
2.3 ODIS development	X	X	X	X	X	X	X	X	X	X
Consultation with all pilot partners on ODIS development	X	X	X	X	X	X	X	X	X	X
Platforms established for communications and exchange of content	X	X	X	X	X	X	X	X	X	X
Action plan and way forward developed for ODIS architecture	X	X	X	X	X	X	X	X	X	X
ToR for contractor (for ODIS-arch) finalised and advertised	X			X		X				
Publish ODIS reference architecture (principles and guidelines to link information systems) (D2.3)	X	X	X	X	X	X	X	X	X	X
Specifications for automated validation published (D2.4)	X	X	X	X	X	X	X	X	X	X
Cross reference capability in participating repository nodes that exposes the assets from other nodes in context for users (D2.5)	X									
Metrics reporting functionality from repository nodes (D2.6)	X	X	X	X	X	X	X	X	X	X
At least two working implementations with the ODIS Architecture of regional node information systems that assemble global and local resources (D2.7)	X									
Feedback mechanisms to collect, summarize and report on applications from the Infrastructure that can be shared in the ocean data and information community (D2.8)	X	X	X	X	X	X	X	X	X	X
2.4 ODIS technical meetings	X (v)	X (v)	X (v)	X (v)	X (v)	X (v)	X (v)	X (v)	X (v)	X (v)
ODIS technical meeting reports	X	X	X	X	X	X	X	X	X	X
2.5 EurOcean service integration	X	X	X							
2.6 MarineTraining.eu service integration	X	X	X							

5.2.1 Deliverables September 2022 – September 2023

Global Hub Development

5.2.1.1 Global hub technology framework developed (D2.1)

- We have the Ocean InfoHub website at https://oceaninfohub.org/
- This site now includes the Global Search Hub as well as project information
- We have just contracted a service provider to work on further revisions of the global search (front end) in response to user feedback (this will be covered under WP5).

Start date for Google Analytics: 24 November 2022

Metrics as of 15 September 2023

- 7970 Users
- 129 Countries
- 949 Searches since 11 April 2023
- 467 Clicks away to an external link since 11 April 2023

5.2.1.2 Regional node technology developed (D2.2)

Regional nodes are currently online and indexed in the knowledge graph (discoverable via ODIS). Each of the three regions will report under WP3.

- INVEMAR CHM-TMT: http://portete.invemar.org.co/chm#/
- SPREP and SPC: https://www.spc.int/, https://www.sprep.org/
- IOCAfrica: Database of Training Opportunities, Projects database, Vessels database [NOTE: need to check how this relates to oceancd.org: discuss with JD and John Ngatia]

- The global hub search portal showcases the three regions and in upcoming revisions will also be showing the communities of practice that we are supporting (including protected areas, EOV, SDG 14.3.1, marine debris).
- OIH-supported development work within each of the regions is actively bringing additional regional partners into the network (to be covered in WP3).

5.2.1.3 Further development of ODISCat

Regional communities and global partners contribute to ODIScat

- This is ongoing; at every new opportunity, organisations are asked to add records to ODIScat, and the projects have a close working partnership.
- Mr Arno Lambert presented an update on ODIS-cat recent developments and future plans.
- Mr Lambert reported that all NODCs have been contacted asking them to review their inputs in ODISCat. About 10 responses have been received so far and records have been updated.

ODIS development

5.2.1.4 Consultation with all pilot partners on ODIS development

This is ongoing. We hold regular WP2 core secretariat and partner meetings:

- 63 WP2 meetings since the last Steering Group meeting, plus 230 meetings with partners
- GitHub repositories: https://github.com/iodepo/odis-arch
- Slack: >3,600 posts in 33 channels. 120 Technical WG members.

5.2.1.5 Platforms established for communications and exchange of content

Completed in 2020 and reported on at OIH-SG-I.

5.2.1.6 Action plan and way forward developed for ODIS architecture

Completed in 2020 and reported on at OIH-SG-I.

5.2.1.7 ToR for contractor (for ODIS-arch) finalised and advertised

- Two contracts are currently underway (Doug Fils, Jeff McKenna).
- ODIS specifications for ten patterns/themes have been written and are developed on an ongoing basis.
- Documentation is available online at https://book.oceaninfohub.org
- Documentation is under continuous revision and improvement.

5.2.1.8 Publish ODIS reference architecture (principles and guidelines to link information systems) (D2.3)

Documentation for the Ocean InfoHub is located at https://book.oceaninfohub.org/. This documentation is structured to address the three primary personas expected in the OIH community. Those being Publisher, Aggregator and User. An introduction to these personas is found at https://book.oceaninfohub.org/personas/persona.html which links out to more specific documentation for each.

5.2.1.9 Specifications for automated validation published (D2.4)

Ocean InfoHub is leveraging and documenting the use of the W3C SHACL (https://www.w3.org/TR/shacl/) recommendation to address the issue of validation. Shape graphs for the OIH thematic types can be leveraged through existing tools to automate validation. The OIH documentation provides a reference implementation of such a validation.

5.2.1.10 Cross reference capability in participating repository nodes that exposes the assets from other nodes in context for users (D2.5)

The Ocean InfoHub Source and Provenance Approaches section (ref: https://book.oceaninfohub.org/thematics/identifier/id.html) describes some of the key approaches used to cross reference resources based on established identifiers. Specifically the documented identifier pattern (https://book.oceaninfohub.org/thematics/identifier/id.html#identifier) leverages an approach that allows both the expression of an ID value and the ID of the property itself. That is, the type of identifier it is, for example DOI and the value of that identifier. Once encoded into the graph, the cross referencing capacity is expressed through the use of the SPARQL query language for RDF graphs. Itself documented at https://book.oceaninfohub.org/users/query.html and https://book.oceaninfohub.org/users/sparql.html.

5.2.1.11 Metrics reporting functionality from repository nodes (D2.6)

Reporting is supported both based directly on the graph generated by the providers and assembled into the Ocean InfoHub graph and by the supporting PROV (https://www.w3.org/TR/prov-overview/) based provenance data generated during the indexing processes.

This can then be used to support reporting functions.

5.2.1.12 At least two working implementations with the ODIS Architecture of regional node information systems that assemble global and local resources (D2.7)

At present 32 nodes from the following 28 partners (shown in green) are indexed in the Ocean InfoHub Knowledge Graph:

MEDIN (Marine Environmental Data and Information Network)	Research Data Australia	Better Biomolecular Ocean Practices (BeBOP) as part of Ocean Biomolecular Observing Network (OBON)
EMODnet	CLME+ training portal	OBIS
EUROCEAN	SeaDatanet	Caribbean Marine Atlas
INVEMAR (LAC regional portal)	OceanScape Project	CORDIO / MASPAWIO
BCC data portal (Benguela Current Commission)	Flanders Marine Institute (VLIZ)	Aquadocs
Canadian Integrated Ocean Observing System	Indonesian NODC	Sargassum Hub
OBPS	Marinetraining.eu	SPC (Pacific Data hub)
OceanExpert	IOC/Africa data portal	SPREP (Pacific Environment Data Portal)
METS RCN - Research Coordination Network for Marine Ecological Time Series	National Marine Data and Information Service (NMDIS) - China	World Ocean Database
	Belgian Marine Data Centre (BMDC)	

We are currently working with a total of 98 partners to bring their holdings into the graph (up from 48 in 2022).

ODIS-architecture implementation by partners:
https://docs.google.com/spreadsheets/d/13bn9IPL8mYOwwoIKtTfx1XgW4FJsvofLSivevGTG7UE/edit?pli=1#gid=0

5.2.1.13 Feedback mechanisms to collect, summarize and report on applications from the Infrastructure that can be shared in the ocean data and information community (D2.8)

Ocean InfoHub has leveraged a range of approaches to collect feedback. These include the Slack channel (120 Technical WG members from partners), email, video conferencing and our GitHub repository. All tasks and partner interactions are documented in Github issues which are open and easy to track.

5.2.1.14 ODIS technical meetings

ODIS technical meeting reports

Regular WP2 core secretariat and partner meetings: 63 core WP2 meetings and 230 partner meetings since SG-III
All meetings are documented and notes are available.

5.2.1.15 EurOcean service integration

Completed 2021/2022 and reported on at OIH-SG-III.

5.2.1.16 MarineTraining.eu service integration

Completed 2021/2022 and reported on at OIH-SG-III.

5.2.1.17 ODIS Project update

- Mr Arno Lambert provided a brief report on ODIS-SG-II held on 3 October 2023

5.2.1.18 Supporting Matchmaking services / human brokerage

- This will be done through a new specification for services offered and needs requested, and implemented on the front end by the new UI team.

5.2.1.19 Supporting communities of practice (new patterns)

- Protected Areas (SDG 14.5)
- EOVs
- SGDs, specifically 14.3.1 OA
- Marine debris
- Horizon projects (MARCOBOLO, WorldFAIR)
- UN partners (FAO, WMO, UNEP, UNDRR)

5.2.1.20 Supporting other domains

- Meteo / WMO WIS2,
- Polar,
- Population health
- Heimholtz unHIDE
- Maregraph
- WorldFAIR constituents

5.2.1.18 OIH WP2 contractor reports

Doug Fils provided a brief overview of some of his work.

The Ocean InfoHub Project has developed a collection of guidance and procedures for the development of a Knowledge Graph based on the contributions of the ODIS partners facilitated through the leveraging of web architecture approaches.
The **Ocean InfoHub Knowledge Graph** is a comprehensive, interconnected web of information that encapsulates the vast array of data, knowledge, and resources related to the world's oceans. It is an integral part of the Ocean InfoHub project, which aims to enhance the discovery and interoperability of existing oceanic information systems through the **Ocean Data and Information System (ODIS)** architecture. The community of partners defines the context by which knowledge is represented and the constraints need to align to shared goals.
The processes, policies and implementation are done in an open manner with the intent that the process could be implemented by others or re-implemented in other ways.

The Stage

A web of data

- To facilitate **discovery** and **access** and **operations** on the data.
- *Objects and Interactions (in the cloud, at our desks, mobile)*

Sustainable, Scalable, Extensible

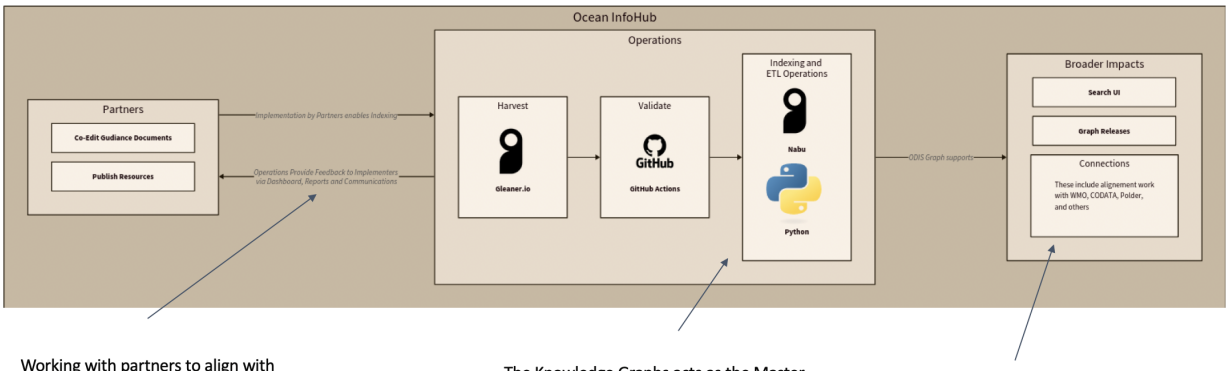
- The web architecture foundation provides these properties in an accessible and commodity environment

Standards Driven

- Things not Strings
- Data on the Web Best Practice
- Spatial Data on the Web Best Practices
- Linked Data Platform 1.0
- GoFAIR

Implementation: Overview

Ocean InfoHub coordinates the communication, implementation and broader impacts of the project.



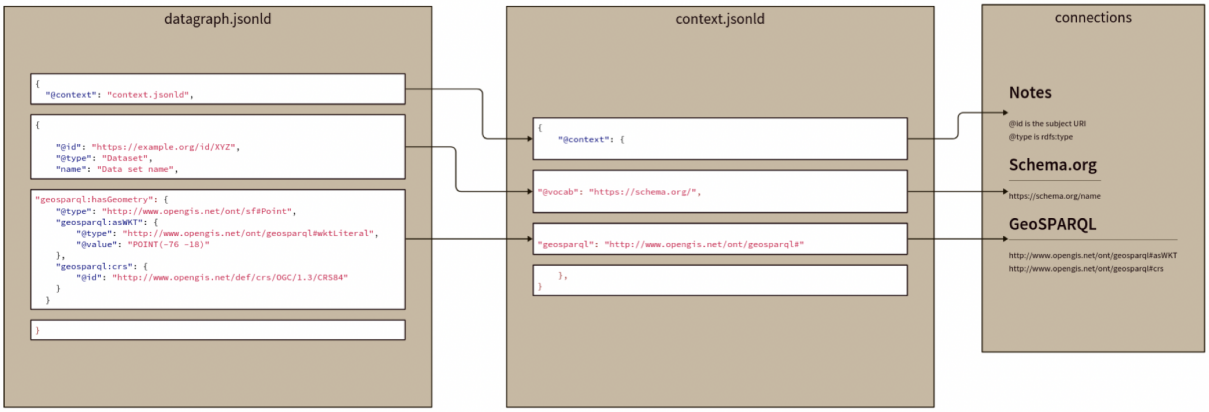
Working with partners to align with web architecture approaches and guidance is a significant component of current work.

The Knowledge Graphs acts as the Master Data Catalog. ETL/ELT workflows for features such as Solr index and spatial geometries are being refined to improve efficiency and sustainability.

Additional ETL/ELT activities on the Knowledge Graph support broader impacts.

Context and Profiles

The OIH Book (https://book.oceaninfohub.org) holds the documentation and guidance for the profiles describing the thematic types. It defines the ***shared vocabulary for the understanding of the concepts and resources*** of the OIH community of partners. This is the JSON-LD Context, and it expresses the **mapping of JSON keys to URIs**. URIs are unique identifiers that reference concepts, people, and places on the web. At present ***OIH uses the Schema.org and GeoSPARQL vocabularies***.

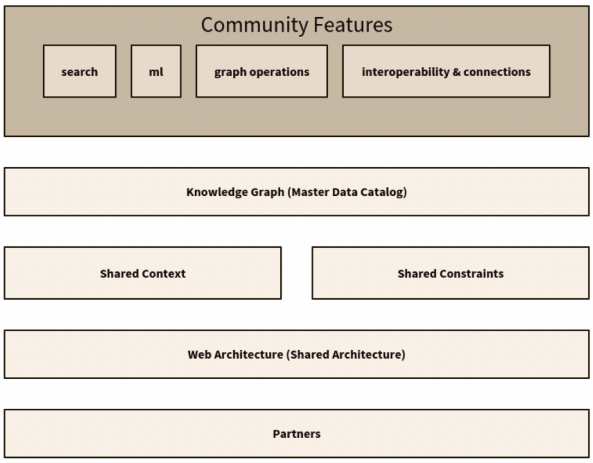


OIH Graph: A "Trusted Data" Resource for ODIS

We can view the ***OIH Graph as an authoritative source of data***. It expresses the definitions, relations, provenance and instances of community resources.

This is done in an open and standards driven approach that offers ***flexibility and scalability***.

The OIH Graph is a ***product of the process and principles*** and as such ***is not proprietary***. Anyone could and should generate it if they choose to.



Broader Impacts

Ocean InfoHub development of approaches and procedures **influenced external projects**.

Additionally, approaches to the creation and **alignment of Knowledge Graphs** has potential in areas such as **FAIR data and Machine Learning** applications.

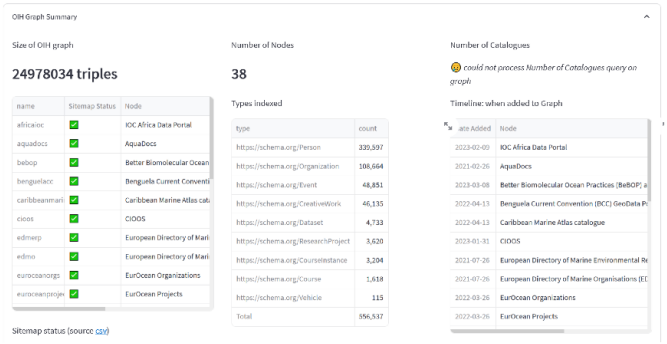
Examples of these include:

- GeoBON
  - Leveraging approaches and implementation patterns
- Polder
  - Discussions on alignment of graphs
- U.S. National Science Foundation
  - Collaboration on implementation approaches with future alignment of graphs
- Helmholtz Association
- Ocean InfoHub Graph
  - Outreach to the ML community

Jeff McKenna provided a brief overview of some of his work.

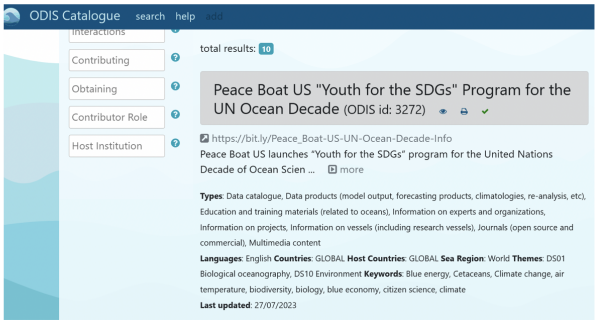
Dashboard

Real-time Dashboard for ODIS partners



ODIS Catalogue

- https://catalogue.odis.org/
  - Important for ODIS partner connection
  - Next steps needed:
    - connect ODISCat to ODIS harvesting
    - replace current (manual) YAML config files for ODIS



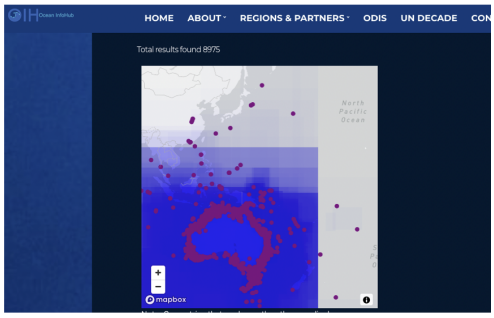
- partners are encouraged to record their endpoint in the ODIS Catalogue
- effort is needed to connect the ODIS Catalogue to ODIS, to replace the manual maintenance of ODIS configuration files for each node

There are still manual steps involved and ODISCat will assist us (owners will be able to paste their URL). So ODISCat is very important.

OIH Search / Solr index challenges

- https://oceaninfohub.org


```
"txt_publisher":["Australian Ocean Data Network"],
"txt_region":["Pacific Ocean"],
"geom_type":"polygon",
"has_geom":true,
"geojson_point":"{\"type\": \"Point\", \"coordinates\": [154.5, -27.0]}",
"geojson_simple":"{\"type\": \"Polygon\", \"coordinates\": [[[153.0, -26.0], [156.0, -26.0], [156.0, -28.0], [153.0, -28.0], [153.0, -26.0]]]}",
"geojson_geom":"{\"type\": \"Polygon\", \"coordinates\": [[[153.0, -26.0], [156.0, -26.0], [156.0, -28.0], [153.0, -28.0], [153.0, -26.0]]]}",
"geom_area":6.0,
"geom_length":3.605551275463989,
"the_geom":"POLYGON ((153 -26, 156 -26, 156 -28, 153 -28, 153 -26))",
"txt_inLanguage":["en"],
```

- much manual effort to add recent nodes such as RDA, NMDIS, MEDIN, WOD, EMODnet, etc.
- the OIH search strongly relies on proper geometry coordinates

We need to find out also where there are problems sharing data and what are the partner challenges.

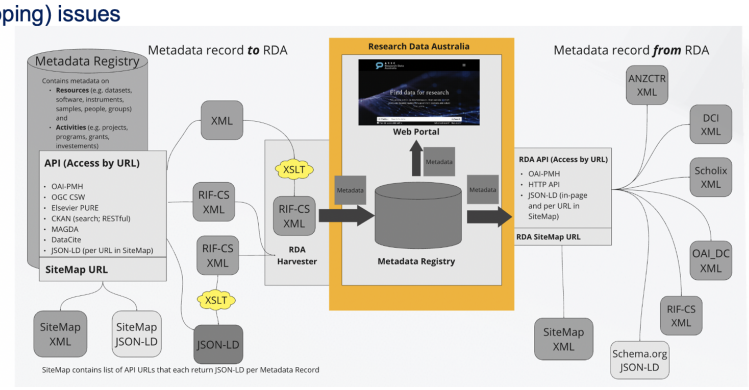
Providing ODIS nodes with assistance for their various metadata endpoints

- much effort is spent helping partners implement JSON-LD for their own software of choice

ODIS Partner examples

RDA (Australia)

- Multiple partner endpoints
- Tackling coordinate (flipping) issues



6. involves multiple regional partner endpoints
7. solved issues of coordinate flipping (X,Y versus Y,X) in metadata

NMDIS (China)

- first partner in the ODIS graph that leverages ERDDAP's JSON-LD
- importance changes made to the default license text
- ERDDAP endpoint
- Assisted in modifying the default license
- Licensing is very important. Countries are getting more difficult about data sovereignty. So we need to make sure licenses are articulated.

Total results found 34

BATM_NMDIS_2021_Zhenzhu_Canyons

Name: BATM_NMDIS_2021_Zhenzhu_Canyons

License: These data are public and free of charge. User assumes all risk for use of data. User must display citation in any publication or product using data. User must contact PI prior to any commercial use of data.

Keywords:
columns data depth lines local source vsoundings

Region: Southern Ocean, Atlantic Ocean

Provider ID: https://oceaninfohub.org/.well-known/org/nmdis

Provider: National Marine Data and Information Service (NMDIS)

Description: Data from a local source. cdm_data_type=Grid CIB_BLOCKS_FOR_UNLIMITED=1 Conventions=CF-1.6, COARDS, ACDD-1.3 Easternmost_Easting=-58.41985772356667 Element_x_size=0.0020833333333333333 Element_y_size=0.0020833333333333333 geospatial_lat_max=-60.97766139303334 geospatial_lat_min=-61.658911393033335...

View JSONLD source

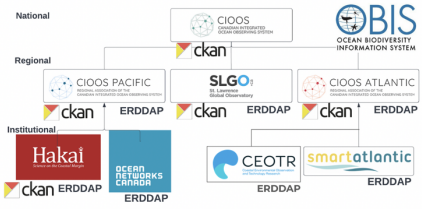
ODIS Partner examples

Ocean InfoHub

CIOOS (Canada)

- Meta-node containing regional partners (Pacific, St.Lawrence, Atlantic)
- Tackled issues of coordinates (GeoShape: Box)
- Multi-languauge support is important in ODIS search/graph, as shown in snippet from CIOOS metadata:

```
"keywords": [
{
  "@language": "en",
  "@value": "watershed"
},
{
  "@language": "fr",
  "@value": "bassin versant"
}
],
```



- shares metadata parameters in both English and French
- ODIS graph and front-end search must properly handle properties such as Keywords, Name, Description etc. in multiple languages

Action item: ODIS will need to look into how to deal with multiple languages.

ODIS Partner examples

MEDIN (UK)

- Leveraging controlled vocabulary for regions (SeaVox)


```
"spatialCoverage":{
   "@type": "Place",
   "geo": {
    "@type": "GeoShape",
    "box": "56.5612 1.8832 56.6135 1.9823"
   },
   "additionalProperty": [
    {
     "@type": "PropertyValue",
     "propertyID": "https://apps.epsg.org/api/v1/GeodeticCoordRefSystem/4326",
     "value": "WGS 84"
    },
    {
     "@type": "DefinedTerm",
     "inDefinedTermSet": "http://vocab.nerc.ac.uk/collection/C19/current/",
     "termCode": "http://vocab.nerc.ac.uk/collection/C19/current/10/",
     "name": "Southern Ocean"
    }
   ]
}
```


- large number of Dataset records (17,000+)
- leverages a controlled vocabulary for region names (SeaVox)

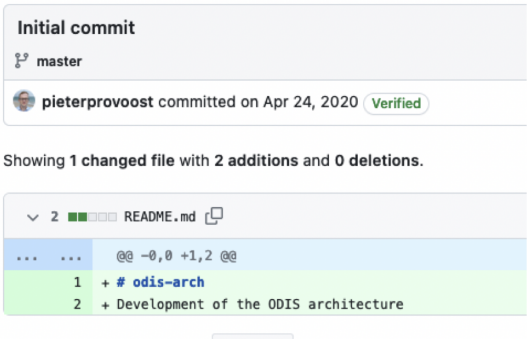
Next steps with ODIS partners

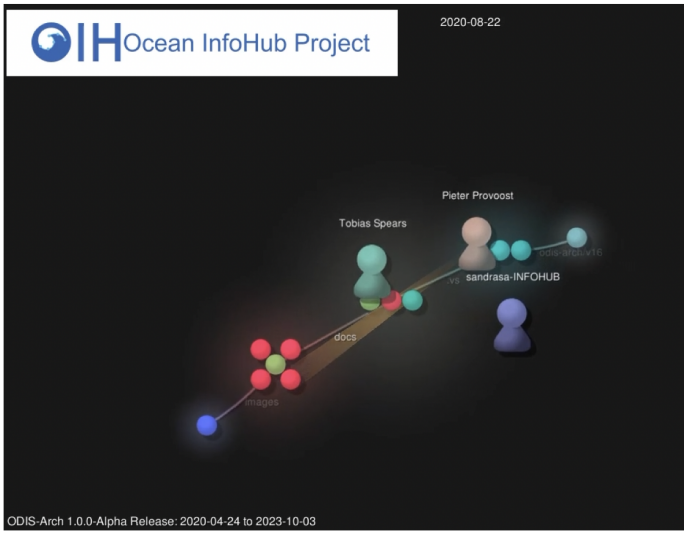
- Provide guidance for less technical groups to get started
- Help provide validation reports through the Dashboard
- Help enable automated notifications, harvesting/indexing of endpoints

	Software	Home	Source Code repository	License	Comments
2	pygeoapi	https://pygeoapi.io/	https://github.com/geopython/pygeoapi	MIT license (Open Source)	- all pages have embedde - strong OGC API suppor - lightweight Python packa - version >= 0.14.0 suppo - very healthy community private company support)
3	pycsw	https://pycsw.org/	https://github.com/geopython/pycsw	MIT license (Open Source)	- does not have JSON-LD has moved to pygeoapi in - strong OGC CSW suppo - very lightweight Python i - used by GeoNetwork, b
4	GeoNode	https://geonode.org/	https://github.com/GeoNode/geonode/	GNU General Public License (Open Source)	- does not have JSON-LD - users like the front-end i
5	GeoNode/pycsw harvest script		https://github.com/iodepo/odis-arch/blob/schema-dev/code/notebooks/Exploration/ina-nodc-harvest.py		- script to generate JSON endpoint
6	GeoNetwork	https://geonetwork-opensource.org/	https://github.com/geonetwork/core-geonetwork/	GNU General Public License (Open Source)	- embeds JSON-LD on all 4.0 release - healthy community - larger installation (not lig
7	CKAN	https://ckan.org/	https://github.com/ckan/ckan	GNU Affero General Public License (Open Source)	- requires plugin to enable - plugin can be enabled fo the "schemaorg" profile e - https://extensions.ckan.i
8	Esri Geoportal Server		https://github.com/Esri/geoportal-server-catalog	Apache License (Open Source)	- no JSON-LD support - v2 works, but lacks thor - supports older OGC CS
9	KoopJS	https://koopjs.github.io/	https://github.com/koopjs/koop	Apache License (Open Source)	- mainly used to convert c ArcGIS clients - leverages NodeJS - has a plugin to generate

Jeff has been tracking software used by partners.

ODIS 1.0.0-Alpha release 2023-10-03





5.2.2 Objectives October 2023 – June 2024

5.2.2.1 Global hub development

- Work on the OIH Front end search portal is ongoing
- We have just engaged a new team to work with us on the front end
- Internally, we have been processing feedback from >60 end-users to triage requests for developments from users (more detail under WP3) in preparation for the front end work.

5.2.2.2 Regional node development

We will continue to work closely with the regions on the three regional hubs and inclusion of additional partners.

5.2.2.3 Development of ODIScat

- Continued development work is planned

5.2.2.4 ODIS development

- Two contracts are underway for the ongoing development of the ODIS-architecture and documentation.
- At a higher level, discussions are underway with the DCU and DCO as well as project partners for using the ODIS architecture to support federation of data and knowledge systems around the world.

5.2.2.5 ODIS meetings

Regular meetings will be ongoing and partners are welcome to join.
Everything appears on the OIH google calendar which can be shared with any interested SG members.

Questions and discussion

AKL: PLB referred to parallel initiatives worldwide. In the EU, Mission Ocean is a huge initiative on data. It started 2 years ago and the idea is that all projects that may relate to ecosystem conservation, digital twins etc. There is one coordination and a support action (CSA)

is developing tools and platforms to be used by all underlying projects. How can I support to link OIH with that CSA? They are developing a similar initiative to OIH.

DF: not familiar with it. Good: the environment mentioned is something where collaboration can be facilitated. It would be good to talk to them.
PLB: many EU infrastructures have project level deliverables so what happens later? We need to reach out as soon as possible. We are using web standards that work for everything.
Action item: Lucy to follow up with Ann-Katrien to make a link to EU Mission Ocean.

WA: What happens if a partner goes offline?
DF: A knowledge graph is generated. If a partner goes offline then we have an old store of data objects and we maintain a provenance. When they come back online we update. The partner is always considered the trusted source.

WA: are you developing procedures for duplicates?
DF: this is on our radar but now we do not have anything. We are discussing with partners but we do not have procedures in place yet.
PLB: not worried about duplication but it is good that we find out about it. For the front-end: we try to implement a lightweight duplication detection system. That will be at the end user side. But this will also be a tool of OIH: duplicate detection.

MP: “delayed answer approach”. Can OIH stimulate certain data to be collected or shared? Brokering.
PLB: yes this is in the plan.

12:33 Lunch break

1330-1430: MAREGRAPH presentation and discussion

5.3 Work package 3: Establishment and support of the global hub and regional nodes

This work package addresses the establishment of the global hub and three regional nodes covering Latin America - LAC (IOCARIBE+), Africa and Pacific SIDS at the operational level.

The technical aspects are covered by work package 2.

This work package focuses on setting up procedures for the sourcing of content, submission of the content, developing of national and regional networking of content providers and users.

Table 3. Work Package 3 overview of timeline

Timeline and Activities	Year 3 (2022)				YEAR 4 (2023)				YEAR 5 (2024)	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun
3.1 Global node establishment and operation										
Contact existing global partners										
Engage new global partners	X	X	X	X	X	X	X	X	X	X
Global hub system established (D3.1)										
Global hub system operational (D3.2)	X	X	X	X	X	X	X	X	X	X
3.2 LAC (IOCARIBE+) node										
3.2.1 discuss stakeholder identification with Secretariat										
3.3.2 create mailing list (OE) for regional stakeholders										
3.2.3 video meeting/webinar with regional stakeholders										
3.2.4 identify D&I needs/ content types/services										
Installation / startup of regional /thematic Ocean InfoHub portal (D3.3)										
Customisation of portal (D3.4)	X	X	X							
Performance testing and remediation of issues (D3.5)	X	X	X	X	X	X	X	X		
Technical and related support from PO until capacity is in place in node (D3.6)	X	X	X	X	X	X	X	X		
Establishment of national / regional networks of content providers (D3.7)	X	X	X	X	X	X	X	X	X	X
Population of regional nodes with content (D3.8)	X	X	X	X	X	X	X	X	X	X

3.3 IOCAFRICA node										
3.4.1 discuss stakeholder identification with Secretariat										
3.4.2 create mailing list in OceanExpert (group) for regional stakeholders										
3.4.3 video meeting/webinar with regional stakeholders										
3.2.4 identify D&I needs/ content types/services										
Installation / startup of regional /thematic Ocean InfoHub portal (D3.3)										
Customisation of portal (D3.4)				x	x	x	x			
Performance testing and remediation of issues (D3.5)	x	x	x	x	x	x	x	x		
Technical and related support from PO until capacity is in place in node (D3.6)	x	x	x	x	x	x	x	x	x	x
Establishment of national / regional networks of content providers (D3.7)	x	x	x	x	x	x	x	x	x	x
Population of regional nodes with content (D3.8)	x	x	x	x	x	x	x	x	x	x
3.4 Pacific SIDS node										
3.4.1 discuss stakeholder identification with Secretariat										
3.4.2 create mailing list in OceanExpert (group) for regional stakeholders										
3.4.3 video meeting/webinar with regional stakeholders										
3.2.4 identify D&I needs/ content types/services										
Installation / startup of regional /thematic Ocean InfoHub portal (D3.3)										
Customisation of portal (D3.4)	x	x	x	x	x	x	x	x	x	x
Performance testing and remediation of issues (D3.5)	x	x	x	x	x	x	x	x	x	x
Technical and related support from PO until capacity is in place in node (D3.6)	x	x	x	x	x	x	x	x	x	x
Establishment of national / regional networks of content providers (D3.7)	x	x	x	x	x	x	x	x	x	x
Population of regional nodes with content (D3.8)	x	x	x	x	x	x	x	x	x	x
3.5 Thematic nodes establishment and operation	x	x	x	x	x	x	x	x	x	x
3.6 Match-making service development and operation, assisting end users with CD queries	x	x	x	x	x	x	x	x	x	x

5.3.1 Deliverables September 2022 – September 2023 as well as objectives to June 2024

5.3.1.1 Global node establishment and operation

The project held 230 meetings during the last 11 months, under WP3, across the three regions, as well as bilateral meetings with regional and global partners. The project participated in numerous external meetings and events (reported under WP5).

A regional report is now provided for each region

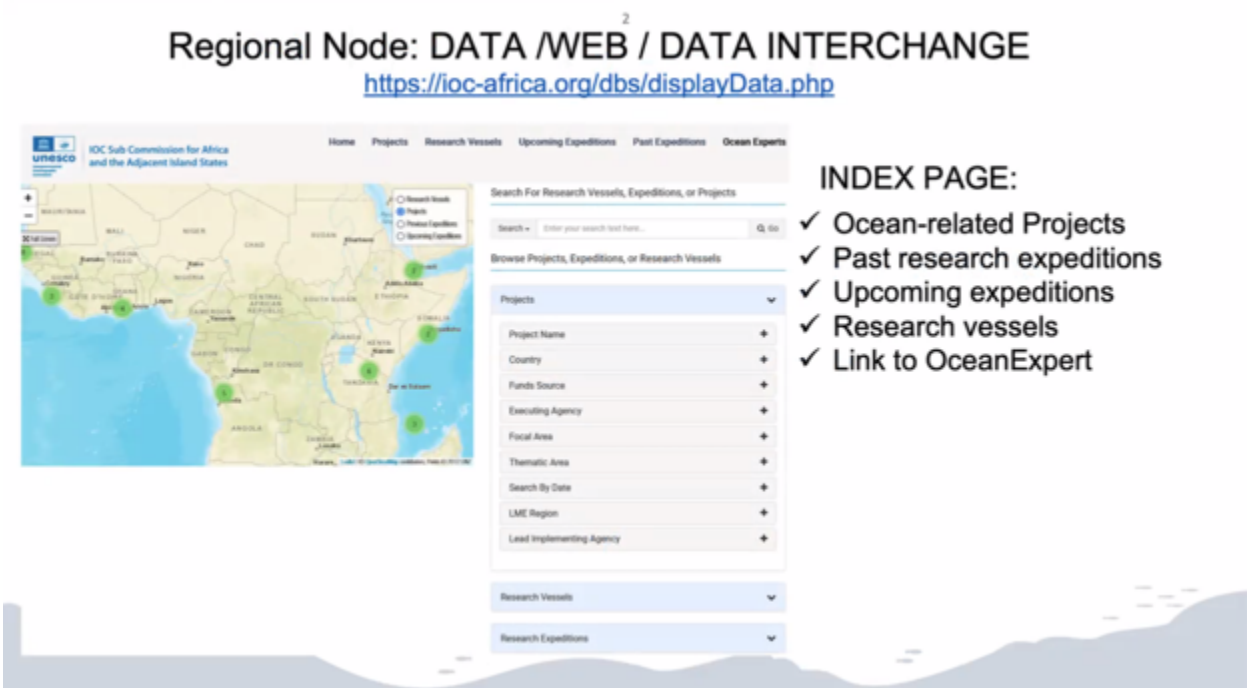
5.3.1.2 Africa (John Ngatia) in person

1. **End-user engagement**

Objective was to:

- Share information about the OIH project and its role in enabling transparent and efficient sharing and access of data and information
- Present the new ODINAFRICA Data Portal including its features i.e. existing data and information infrastructure
- Identify some initial end user needs/knowledge gaps in data sharing and access that can be addressed by OIH products not yet covered by existing OIH initiatives
- Map existing data and information infrastructures that could be potential partners with the Ocean Info Hub
- Discuss way forward for collaboration mechanisms, and review progress in implementation

- Identify some initial end user needs/knowledge products not yet covered by existing OIH initiatives



1.1. Engagement with National Oceanographic Data Centers (NODCs)

OIH facilitated the organization of three NODC-focused Sessions between 2022 and 2023. The last session was on 30 May 2023.
In total, 14 NODCs participated in the session. The discussions focused on identifying:

- Current state of the individual NODCs with regards to sharing and accessing data
- Institution contact point's description of the supporting community and on data the countries hold
- Future perspectives / planned activities and sharing of data / metadata
- Major challenges, needs and opportunities in access / sharing data within NODCs that OIH could help address
- Identification of other NODC data needs needs/knowledge products not yet covered by the OIH

Outcomes of the Sessions

a. <u>Outline of the diverse data themes among NODCs –</u>
- Documents,
- Experts,
- Ocean Observations – Physical, Chemical and Biological parameters
- Marine Species including fish
- Geospatial Data

b. <u>Description of existing data sharing practices (platforms)</u>
- Active exchange with other NODCs and other institutions
- Specific metadata formats.
- Sharing protocols (use of persistent and unique DOIs).
- Use of standardized classifications and vocabularies.

- Open data formats and standard interfaces.
- Many databases are hosted and backed up on local PCs and servers

c. Updated list of NODCs contact persons and supporting communities

d. Mapping of collaboration opportunities with NODCs (OIH intervention points)

- Inexistence of a Database Management System (DBMS) at the NODCs
- Lack of web accessed databases i.e. disconnect between NODCs' Web Portal and their database
- Challenges in management of large marine biological imagery (spatial) datasets.
- Insufficient channels for collaboration with regional data repositories to maximize meta(data) sharing and discovery.
- Absence of regional standards for managing marine and coastal datasets.
- Lack of national data exchange policy and protocols
- Lack of dedicated sustained funding for developing and maintaining data exchange facilities
- Need for more robust database systems i.e. that can work with multiple operation systems

1.2. Engagement with other institutions and experts

Two general information sessions organized between 2022 and 2023.
Last Session on 8 August 2023, attended by app 160 participants. Sessions targeted marine-affiliated organizations in Africa and adjacent island states. The online session, aimed at providing ocean science-affiliated stakeholders in Africa and Adjacent Island States with an interactive platform for deliberating on ways through which they can actively engage and benefit from the Ocean InfoHub (OIH) project, especially in streamlining their access and sharing of marine data.
Main Outcome: Need for follow-up bilateral discussions of how individual institutions can participate in the OIH project.

Regional partners so far
•MarCoSouth, CORDIO, Benguela Current Commission, IUCN, Regional Remote Sensing Centre, UNEP Nairobi Convention Secretariat etc.
• Partners have submitted documentation on data sources / architecture / vocabularies / ontologies / standards to the OIH GitHub Project
Possible new partners: -

RAFISMER Network, PRCM, FAO, COMHAFAT/ ATLAFCO, UEMOA initiatives, BLUE BELT Initiative

Potential Partner	**Data Type**
Digital Earth Africa	Spatial Data
BiCOME Project	Ocean Observation Data Biodiversity
EU Science Hub Africa Knowledge Platform	- Endemic species richness (sharks and rays) data
RCMRD-	Spatial data and maps
CCLME	Spatial data, Physical-chemical data

2. **Developing the OIH Africa Regional Node**
   OIH and IOCAFRICA engaged a contractor to develop the ODINAFRICA portal. The portal entails:

- New database for marine-related projects.
- Database for research vessels in the region,
- Past and upcoming research expeditions in the region,
- A view of the OceanExpert database that harvests in real time Africa region-specific experts and institutions from the main Ocean Expert Database.
- A view of the Aquadocs database that harvests in real time Africa region-specific ocean-related documents
- Ocean observation platforms - The database also comprises of data and information extracted from existing study reports on status of ocean observation platforms and infrastructure, while providing links to major ocean observation platforms in the region and allow for the monitoring of their status.
- Standard static web pages for each of the NODCs that link to either the NODC website or to the host institution.

A catalogue service for Projects, research vessels, Past and Upcoming expeditions was set up . It exposes each record through JSON-LD, to become a node within OIH's ODIS network

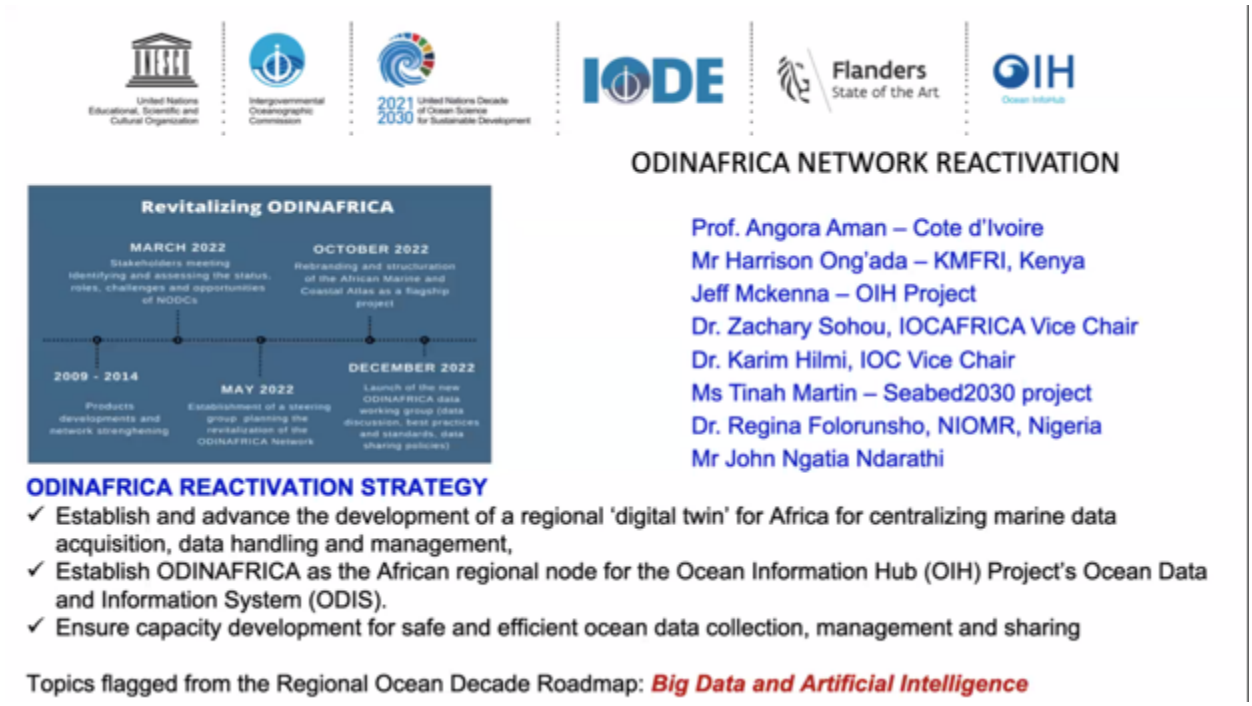
Statistics

Data	**Entries**
marine-related projects	240
research vessels	28
Past Expeditions	127
Upcoming Expeditions	2
OceanExpert: Experts Institutions	 2702 628
Documents	5252
Ocean Observation Platforms	-
Training and research opportunities (https://africa.marinetraining.org/map)	173

3. Reactivating the ODINAFRICA Network

Workshop in 2022

- The status, roles, challenges and opportunities of National Oceanographic Data and Information Centre (NODCs),
- Progress in implementing the OIH project in Africa, specifically on addressing the six OIH project thematic areas: (i) experts and institutions/organizations, (ii) documents, (iii) Spatial data and maps, (iv) research vessels, (v) education and training opportunities, (vi) projects;
- The steps towards developing a joint framework for member states and institutions in the region to actively engage and contribute to the Ocean Data and Information Ne



In 2023:
Revision of the strategic plan developed in 2022 to include 'Ocean Observation and data management' as an area of focus for a revitalized ODINAFRICA. This is based on the recommendations from the Seventh Session of the Sub-Commission (IOCAFRICA 7).
'Urges the GOOS AFRICA Coordinating Committee to work with the Ocean Data and Information Network for Africa (ODINAFRICA) towards the establishment of an African Ocean Data Centre.'
With input from OIH, the ODINAFRICA Steering team is scheduled to deliberate/agree on 3 or 4 themes of focus of the revitalized ODINAFRICA in their routine meetings. Proposed themes of focus for ODINAFRICA so far:

I. Reactivation of ODINAFRICA to contribute to the Ocean Information Hub (OIH) as a regional and multi-thematic node that will improve online access to and synthesis of existing regional and national data, information and knowledge resources, including existing clearinghouse mechanisms.
II. Capacity development for transparent and efficient ocean data collection, management and sharing
III. Strengthening the ocean observation, especially sea-level stations network in the region
IV. And / Or Alternatively
V. Establish and advance the development of a regional 'digital twin' for Africa for centralizing marine data acquisition, data handling and management

Planned series of meetings:

i. Analysis of GAPS and Challenges for ODINAFRICA (Virtual Session)

Proposed time: 29 August 2023

ii. Information Session: Aligning ODINAFRICA with Existing resources (virtual meeting)

Proposed time: 12 September 2023

iii. Towards a Strengthened and Sustained Sea Level Observation Network (Joint GOOS -OIH AFRICA Workshop)

Proposed time: Feb 2024

5.3.1.3 Latin America and the Caribbean (Francisco Arias/ Paula Sierra) via Zoom (1500)

Overview of OIH activities: stats on regional portal

- ✓ CHM Lac technological platform is currently fully operational 24/7.
- ✓ Users can efficiently access its resources and functionalities, ensuring a smooth and satisfying experience.
- ✓ Recently, new records(ArcGIS REST resources) have been obtained for geospatial information module, given the operation of a robot made in Python developed by an engineer from INVEMAR. In addition, new data has been collected from the previously worked tools, thus keeping the modules updated.

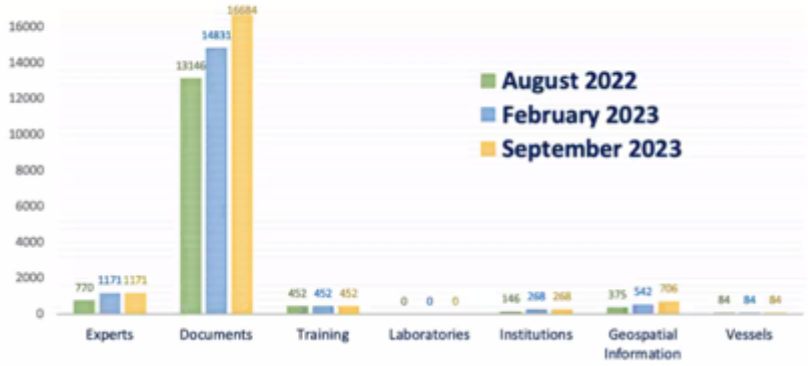
September 2023

Overview of OIH activities: stats on regional portal

19361 data sets from > 17 countries of the region.

ODIS Training course –OTGA:

10 experts trained in Colombia (4 INVEMAR)



Overview of OIH activities: data providers

- Partners currently being engaged from: Argentina, Chile, Peru, Ecuador, Brazil, Uruguay, Venezuela, Colombia, Panama, Costa Rica, Honduras, Dominican Republic, Trinidad & Tobago, Cuba, Mexico, EEUU, Canada. SARGASSUM platform (21 resources - documents category).

SargassumHub	documents	oai_dc	http://repository.oceanbestpractices.org/	oai/request?	No	col_11329_1277	0	2023-09-05T14:16:43.194000-05:00	True	21	

24/7 platform availability.

10 Technical meetings attended (two by month with expert team for the Global project)

Overview of OIH activities: End user engagement

End-user engagement through dissemination at regional meetings/events:
2022

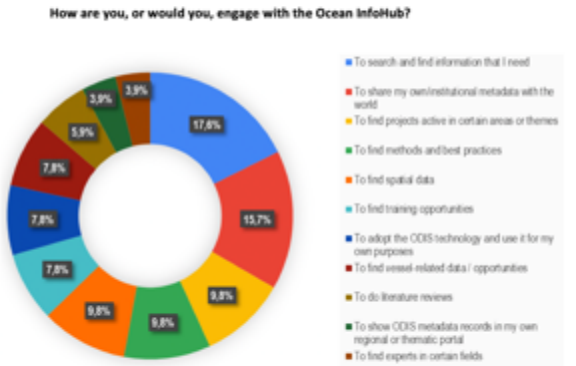
1. 74th GCFI Conference – November
2. 48th IAMSLIC Conference & 4th Latin American Regional Group Meeting –October
3. MACHC Marine Spatial Data Infrastructure Working Group (MMSDIWG) (Meso-American and Caribbean Hydrographic Commission -MACHC) -October

LAC Results from "end user engagement survey":

Type user	Count
Contributor	5
Finder data and information	3
Neither	2

Profile User	percent
Scientist (research, academic and private sector)	60
Government agencies/ Policy-makers	30
General public	10

Recommendations:
- I think must improve the smartphone interface.
- Guidelines or criteria on sharing or uploading research reports from the Institute of Marine Affairs
- Use alphabetic order for the options in each search to facilitate queries



* 10 responses from LAC countries (Argentina, Brasil, Colombia, Mexico, Perú, Trinidad and Tobago)

End user engagement planned

ACTIVITY	DATE
To continue technical support 24/ 7 for the platform.	2024
Continue engagement of new data providers, as much as possible Invemar's technical capacity	2023- 2024
Dissemination of OceanInfoHUB LAC node use (75th GCFI Conference) –	November 2023

Recommendations:

- Most of the institutions/countries of the region don´t have published/online capacities (marine instrumentation/vessels mainly e.g.) and these are not often available to be linked from metadata. Given this, OIH LAC has not yet been able to capture all the real supply of capacity in the topics proposed for the region. Thinking about strengthening the capacities of institutions to publish information can be an activity to be taken into account in the framework of the Decade of Ocean Sciences (A transparent ocean...) and that in an important way also influences the results for the GOSR (Global Ocean Science Report).
- The characterization of the "Laboratory" category lacks a template with minimum attributes, which means that no records have been reported for that category to date, despite the fact that there are records for the region.
- NODC and ADU must have more intense activity to promote information sharing through OIH

Challenges (technical)

- Provide librarians in interested countries small trainings on "how to enable and configure OAI in their document repositories (Koha, Dspace, etc.)" to make the resources offered more visible.
- Strengthen the development team; we have good ideas, but no people.
- Sargassum hub, offers directory of entities and experts through a geoservice.

5.3.1.4 Pacific Small Island Developing States (PSIDS) - Tavita Su'a (SPREP) and Stanislas Ozier (SPC)

Activities

- Provide to librarians in interested countries small trainings on "how to enable and configure OAI in their document repositories (Koha, Dspace, etc.)" to make the resources offered more visible.
- Strengthen the development team; we have good ideas, but no people.
- Sargassum hub, offers directory of entities and experts through a geoservice.

Pacific Node Overview

- Represented by 2 regional organizations
    - Secretariat of the Pacific Regional Environment Programme (SPREP)
    - The Pacific Community (SPC)

- Platforms
  - Pacific Environment Portal (PEP)
  - Pacific Data Hub (PDH)
- Members
  - Serve 14 Countries and 7 Territories spanning the Pacific Region namely
  - American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Marianas Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis and Futuna

Statistics – PEP Connected Data Sources

Dashboard | Countries | Topics | Tags | Formats | Groups | Harvesters

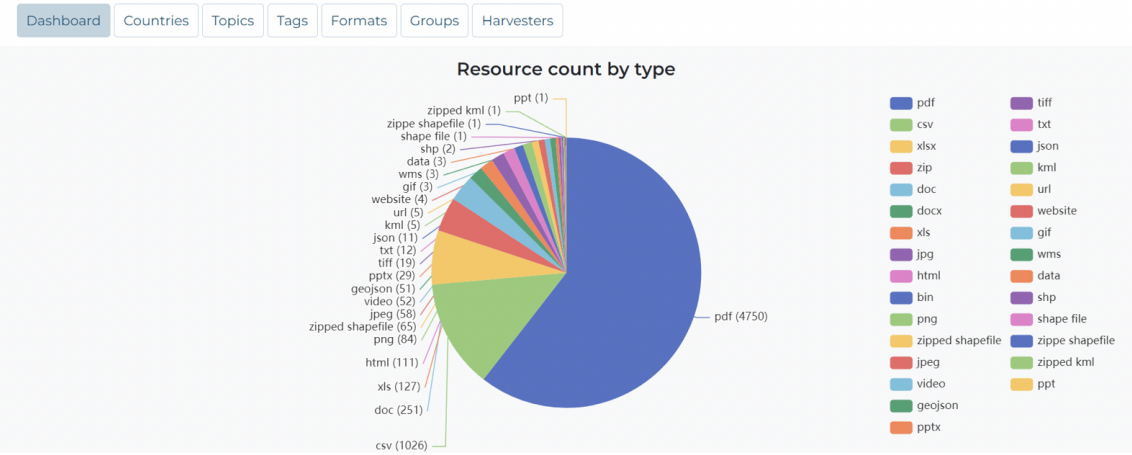
Harvester	Datasets	Last Run
SPREP VL PA Resources	379	02-Oct-2023 13:39:02 UTC
SPREP VL EIA Resources	998	02-Oct-2023 13:35:58 UTC
PDH Datasets	15420	02-Oct-2023 13:33:57 UTC
Samoa	79	02-Oct-2023 13:30:22 UTC
Vanuatu	145	02-Oct-2023 13:29:04 UTC
Kiribati	89	02-Oct-2023 13:27:42 UTC
Palau	81	02-Oct-2023 13:26:14 UTC
Tuvalu	129	02-Oct-2023 13:25:37 UTC
Tonga	122	02-Oct-2023 13:24:18 UTC
Solomon Islands	180	02-Oct-2023 13:23:29 UTC
PNG	430	02-Oct-2023 13:11:07 UTC
RMI	188	02-Oct-2023 13:06:08 UTC
FSM	164	02-Oct-2023 13:02:17 UTC
Nauru	170	02-Oct-2023 13:01:13 UTC
Cook Islands	139	02-Oct-2023 13:00:02 UTC
American Samoa	15	01-Oct-2023 13:46:14 UTC

Statistics – Publishers/Groups

Dashboard | Countries | Topics | Tags | Formats | Groups | Harvesters

Groups	Datasets	Resources
Pacific Data Hub	15421	44330
Secretariat of the Pacific Regional Environment Programme (SPREP)	435	446
Department of Environment	331	566
PNG Conservation and Environment Protection Authority	309	607
Secretariat of the Pacific Regional Environment Programme	298	783
Nauru Department of Commerce	162	188
Industry and Environment	162	188
FSM	138	246
Solomon Islands Ministry of Environment	134	272
Climate Change	134	272
Disaster Management and Meteorology	134	272
Cook Islands National Environment Service	119	287
Tuvalu	118	167
Tonga	111	195
SPREP Pacific Environment Information Network (PEIN)	111	156

Statistics – Resources

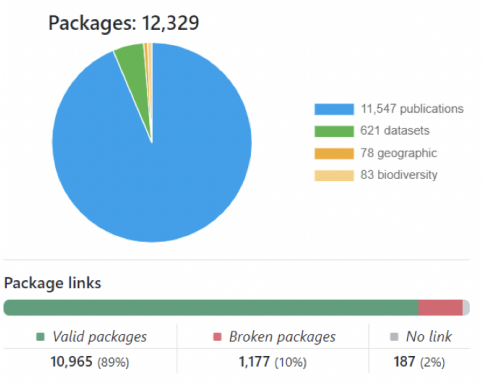


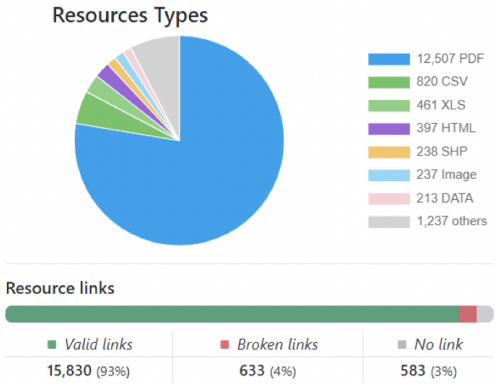
Statistics – PDH Harvesters

Harvester	Packages	Last run					Status
Gov NC Open Data	430	2023-10-02		2			DAILY
PCCOS Ocean Catalogue	16	2023-10-02		7			DAILY
PDH Microdata Library	213	2023-10-02					DAILY
PDH.stat	136	2023-10-02		53			DAILY
SPREP Pacific Data Portal	1534	2023-09-30		31		8	WEEKLY

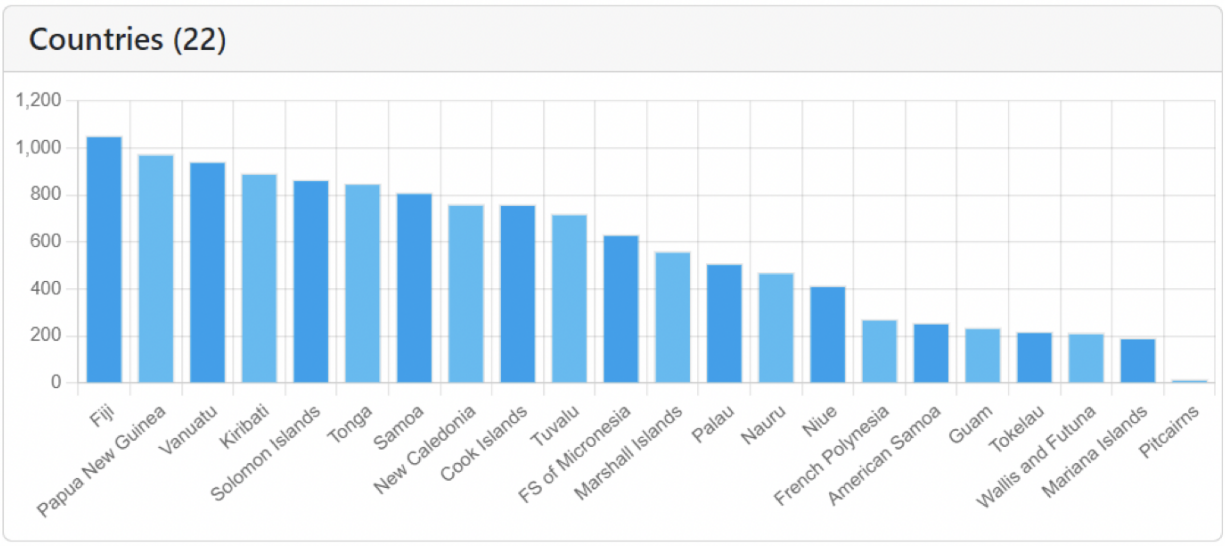
- Harvesting all datasets from SPREP
- Harvesting from other data catalogues (sometimes directly from member countries)
- Lots of geospatial/ocean related datasets coming up (from SPC GEM divisions)

Statistics – PDH Overview

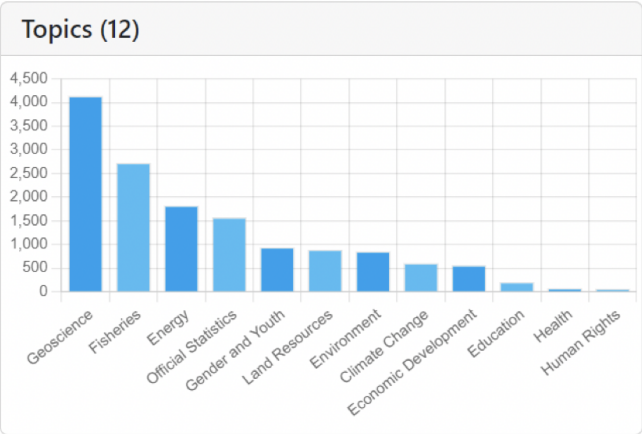




Statistics – PDH Member countries



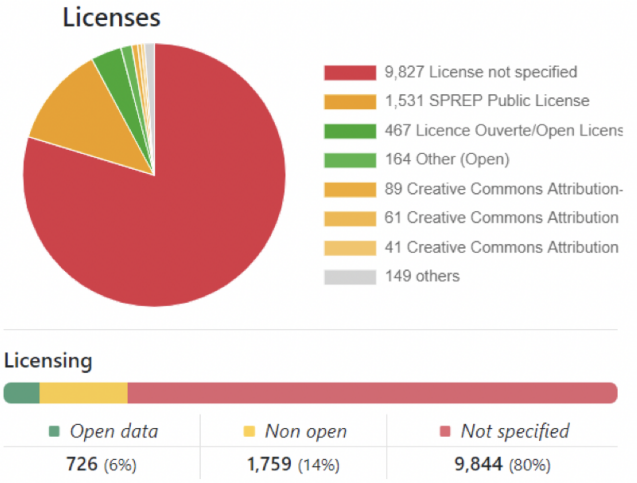
Statistics – PDH Topics



PDH is a regional and general data catalogue.

Topics need to be revised to answer our users' needs and help ODIS better index and filter relevant datasets.

Statistics – PDH Licensing



SPREP and SPC mandate include data policy coordination with our member countries.

One of the goals within this mandate is to improve licensing of datasets shared through our regional catalogues.

From PDH/SPREP to ODIS

- Updates
  - Added XML sitemaps and JSON-LD to the Pacific Data Hub
  - OIH now harvesting PDH datasets (SPREP datasets included)
- Issues
  - Metadata and JSON-LD compatibility issues (e.g. distribution link)
  - SPREP datasets not clearly identified on OIH (as coming from PDH)
  - All entries identified as "datasets" (publications vs. datasets)
- Fixes
  - Quick fix (OIH): identify SPREP data based on list of specific sitemaps
  - Full fix (PDH): JSON-LD issues (data type, includedInDataCatalog, contentURL distribution link)

General User Feedback

- Showcased OIH to potential end users in the Pacific
- General understanding of the OIH
- Pathway for providing data to the OIH
- Providing Content to OIH
- Usability

Potential Additional Nodes

Regional

Dataset	Comments
OPOC Ocean Initiatives Registry	https://backbeachsoftware.com.au/opoc/index.htm
Pacific Islands Regional Oceanscape Program (PROP)	https://data.worldbank.org/ https://datatopics.worldbank.org/sdgatlas/ *3 documents, 20 datasets, 1 institution, 1 spatial search - Information on these are available on OIH via European Directory of Marine Organisms (ENDO) SeaDataNet but limited to Northern Hemisphere only*
Western & Central Pacific Fisheries Commission Record of Fishing Vessels	https://vessels.wcpfc.int/browse-rfv
Western & Central Pacific Fisheries Commission Conservation and Management Measures	https://cmm.wcpfc.int/
Pacific Islands Forum Fisheries Agency Vessels in Good Standing	https://rimf.ffa.int/public/goodstanding/list

Table 1: List of regional datasets that could be included in the OIH

Regional Engagements - Pacific Islands Conference on Ocean Science and Ocean Management (PICOSOM)

- What support is available from OIH to conduct capacity training workshops for end users in the Pacific?
    - Our experience in the region has shown that in-person workshops and training events are far more effective than online and self-paced learning.
    - Regional events like the PICOSOM are great forums for delivering in-person capacity building.
    - PDH and PEP are currently not funded to deliver OIH or ODIS training

- Many ocean data products and catalogs were featured in the "Information portals and databases" workshop sessions during the 1st Pacific Island Conference on Ocean Science and Ocean Management (PICOSOM)

    - participants expressed a need for better coordination to avoid duplication
    - the idea for a "catalogue of catalogues" was proposed during one session

- Priority Areas Identified:
    - Traditional ocean knowledge, practices and governance
        - What role can OIH/ODIS play in ensuring traditional knowledge is recognized, preserved and protected?
    - Ocean policy and management
        - What support can OIH/ODIS provide to engage with policy and decision makers?
    - Capacity strengthening and community involvement
    - Science and decision support system
    - Communicating ocean science, traditional knowledge and ocean management
        - OIH/ODIS support for engagement with Pacific media to raise awareness about the information and data products that are accessible through OIH?
    - Financing Ocean Science and Ocean Management
    - Advancing the UN Decade of Ocean Science for Sustainable Development in the region

Recommendations

- OIH currently indexes all datasets/documents from an extended list of topics that includes those not related to Oceans. Need to document the scope of OIH and communicate it clearly or filter out non-oceans datasets/documents
- Regional nodes should also harvest relevant regional datasets/documents from OIH. Need guidance on implementation to avoid re-harvesting datasets/documents already indexed
- Explore funding opportunities to support planned activities and ongoing ODIS/OIH implementation
- Need to showcase value of data collected to our member countries and stakeholders through dashboards and other data products
- OIH harvests from PDH. PDH harvests from PEP (SPC)
- To end users it is not always clear how they can contribute data/other content.
- Usability: interface is now mainly for large screens, not for handheld devices

Questions and discussion

PP: Do we know what content types and what subjects are the most popular? Do we know who the users are? Also, do we know what they are looking for and if they find it what do they use the data/information they obtained through OIH for? (this was mentioned somewhat in the P-SIDS presentation but no details were provided). A goal down the road might be providing information to decision-makers. The three regions could identify priorities and have this funded through a project in each region (with external funding), to demonstrate the delivery of products.

SO: The data catalogue is the main component but we also have dashboards which is a point of entry for our users, together with data visualisation. So we cover different topics: e.g. population pyramids and estimates, maritime boundaries, trade, education, and new dashboards as new data become available. We have been using Power BI software to have a first go, and to get initial feedback.

TS: lots of searches are from people who want to know what exists in the Pacific. Mostly our members are party to multilateral agreements. Climate change is a big topic, as well as waste,

and plastics: they want to know what exists on these umbrella topics (as examples) for each country.

PLB: This is also an opportunity to show data space behaviour. It is difficult to determine exactly what users need – in MARCOBOLO for example we are trying to figure out exactly what to deliver and to whom.

PP: We should look at regional subsidiary body work plans. We should be able to identify the main issues of concern (for example coastal erosion in Africa and Sargassum in the IOCARIBE region) and thus some topics to work on. Maybe we could have a pilot activity in each region.

JF: There are some entry points: at national level, annually, all ministries need to report to parliament on the status of the environment. If you read the ministers speeches figures are not changing because they do not have the latest information. We can actively look at speeches and provide this latest information; we can establish a working relationship with ministries. Also: state of the environment (SOE) reports are produced in our region (WIO) every 5 years.
Most are based on desk reviews because they do not get the information from scientists, so that could be another product. For global reporting we can also be more active in providing information to global instruments. So it is for us to play a more active role.
For the Africa region, a lot of data are in various institutions: UNEP has CHM, some have ODINAFRICA, GMES, and there are centres at AU level. The issue is how to get these actors to be able to talk to each other. Projects have the challenge of data management once projects are finished. This data, once the project is over, what happens to the data? Another recent issue is how to ensure that data are analysed and used (WIOMSA has been discussing with FAO).

Chat: FA: Pier Luigi, just to mention the importance of regional offices' role as it was raised by Peter. IOCARIBE's interim condition had an effect on reaching parties, coordination is being reinstalled with the secretariat in the region.

Chat: PLB: An example of a triaged issue based on user input:
https://github.com/orgs/iodepo/projects/13/views/1?pane=issue&itemId=35243036

Chat: PLB: Much of the user feedback gathered in the survey have been converted to actions for our next phase of updates to the OIH UI/UX:
https://github.com/orgs/iodepo/projects/13
This is another example of bringing the technological change closer to the social needs.

5.4 Work package 4: Training and capacity development of the nodes

This work package focuses on the development of a series of online training modules and tutorials as well as written documentation such as manuals. WP4 only commenced in 2021.

Table 4. Work Package 4 overview of timeline

Timeline and Activities	Year 3 (2022)				YEAR 4 (2023)				YEAR 5 (2024)	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun
4.1 development of online training modules (6 modules)	X	X	X	X	X	X	X	X	X	X
Operations manuals (D4.1)	X	X	X	X	X	X	X	X	X	X
Online training courses (D4.2)	X	X	X	X	X	X	X	X	X	X
Communication skills course (D4.4)		X								
4.2 in-class training courses	X									
Coordinated staffing, professional development and other strategies (D4.3)	X	X	X	X	X	X	X	X	X	X
4.3 online hosting of training materials	X	X	X	X	X	X	X	X	X	X

4.4.1 Deliverables September 2022 – September 2023

4.4.1.1 Development of online training modules

- IOC/OTGA/OIH Training course: Implementing the Ocean Data and Information System (ODIS) architecture. 25-29 October 2021 [online]
- All course materials have since been translated into Spanish, French and Portuguese.
- During April 2023, four courses were held (one in each language), and subsequently courses were made available for self-paced learning.

4.4.1.2 Operations Manuals: ODIS-architecture documentation
https://book.oceaninfohub.org

4.4.1.3 Online Training course:

IOC/OTGA/OIH Training course: Implementing the Ocean Data and Information System (ODIS) architecture. OceanExpert information: https://oceanexpert.org/event/3921 [online and then self paced].
Courses will be closed in December and then re-opened in January 2024.

- ENG: https://classroom.oceanteacher.org/course/view.php?id=928
- SPA: https://classroom.oceanteacher.org/course/view.php?id=929
- FRE: https://classroom.oceanteacher.org/course/view.php?id=930
- PORT: https://classroom.oceanteacher.org/course/view.php?id=931

Training course numbers
2021: 59 in English
2023: 81 across English, Spanish, Portuguese, French

4.4.1.4 Communication skills course

At OIH-SG-III it was resolved that elements of communication be incorporated into the existing courses, and also that tools be developed to assist global search hub users. This will be implemented by the new front-end development team.

4.4.1.5 In-class training courses

Held in 2021, but not yet repeated.

4.4.1.6 Online hosting of training materials

IOC/OTGA/OIH Training course: Implementing the Ocean Data and Information System (ODIS) architecture. 25-29 October 2021 [online]

- OceanExpert information: https://oceanexpert.org/event/3921
- ENG: https://classroom.oceanteacher.org/course/view.php?id=928
- SPA: https://classroom.oceanteacher.org/course/view.php?id=929
- FRE: https://classroom.oceanteacher.org/course/view.php?id=930
- PORT: https://classroom.oceanteacher.org/course/view.php?id=931

4.4.2 Objectives October 2023 – June 2024

4.4.2.1 Development of online training modules

Online resources continue to be developed and improved (related to reporting under WP2)

4.4.2.2 Operations Manuals: Further development of the ODIS-architecture documentation https://book.oceaninfohub.org

Questions and discussion

CM: For future purposes and learning, it is important to ensure that all learning is in the OTGA platform. Colleagues from Pacific said: almost all highlighted the need for on-site training. But if you have an overview of the target audience for the training then we can more easily develop the courses. When we develop trainings, we need to know the level (high level or specialised data training).

LS: These TCs are very important to support the project and we also have training in other ways: the work that Jeff does with partners is 1-1 so he can address their specific needs and questions. Another is the improvement of the documentation, taking into account feedback from training activities. In different regions we have contracts (currently Africa and Pacific) and elements are public awareness, outreach and identifying needs. So we have a range of approaches to identifying needs and we are open to suggestions on how to develop those further.

5.5 Work package 5: Communication, user marketing and feedback

This work package covers the communications and engagement activities needed to ensure the relevance and usefulness of the Ocean InfoHub global and regional/thematic nodes, to promote community participation in the Ocean InfoHub as contributors and users, and to solicit input needed to foster ongoing development of the Ocean InfoHub nodes.

Table 5. Work Package 5 overview of timeline

Timeline and Activities	Year 3 (2022)				YEAR 4 (2023)				YEAR 5 (2024)	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun	Jul-sep	Oct-Dec	Jan-mar	Apr-jun
WP5: Communication, users marketing and feedback:									YEAR 5 (2024)	
Implementation of the communications plan (D5.1)	X	X	X	X	X	X	X	X	X	X
5.1 participation in meeting and workshops (D5.2)	X	X	X	X	X	X	X	X	X	X
Regional / global webinars *cross ref with WP3	X	X	X	X	X	X	X	X	X	X
5.2 community surveys (by global hub and regional nodes)	X	X	X	X	X	X	X	X	X	X
Engage with global partners to ID needs	X	X	X	X	X	X	X	X	X	X
Engage with three regional communities to ID needs	X	X	X	X	X	X	X	X	X	X
5.3 communication services including social media, web site	X	X	X	X	X	X	X	X	X	X
News releases, communications materials developed (national, regional, international) (D5.3)	X	X	X	X	X	X	X	X	X	X
Raise awareness for collaboration via IOC Circular Letter to Member States/ Presentations at events	X									
Mailing lists set up (D5.4)* Mailing list activity also in WP3										
Logo developed										
OIH web page on IODE site updated by Project Manager										
Contributor and user satisfaction surveys / reports (D5.5)	X				X					
Active updates on project progress: Project Steering Group/ IOC/CD Secretariat and IOC regional offices/ IODE Secretariat/ Member State contacts	X	X	X	X	X	X	X	X	X	X
Updated needs assessments (D5.6)					X					
5.4 publications and reports	X	X	X	X	X	X	X	X	X	X

5.5.1 Deliverables September 2022 – September 2023

5.5.1.1 Participation in meetings and workshops

- Altogether, the project has organised or participated in 317 documented virtual, physical or hybrid meetings, webinars or events (besides staff meetings) since the last Steering Group meeting.
- Many of these were internal WP2 or WP3 meetings, but many internal meetings include partners and can also be seen to contribute to WP5.
- Many of these events contributed directly to awareness raising about OIH activities, objectives, and benefits of partnership.

Selected examples (a full list is available)

- WIOMSA Symposium, Ocean Decade special session (October 2022)
- GEF IWLearn 5 inception II (October 2022)
- Marine Spatial Data Infrastructure Workgroup meeting of Meso American-Caribbean Sea Hydrographic Commission (MACHC) (October 2022)

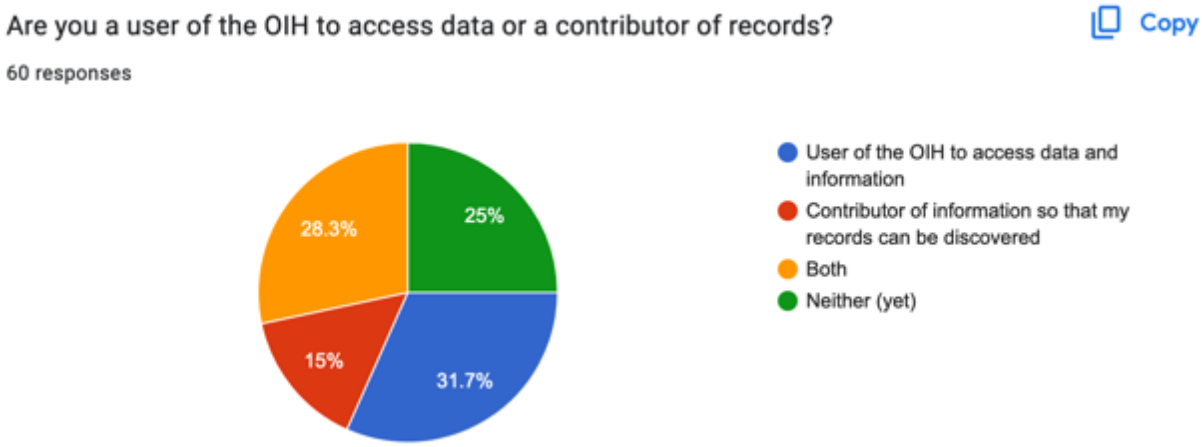
- IAMSLIC 2022 Conference & & 4th Grupo Regional LatinAmericano Meeting (October 2022)
- Gulf Caribbean Fisheries Institute GCFI 75th conference (November 2022)
- OIH: Expeditions Pattern ODINAFRICA (November 2022)
- OIH: Global Platform for Marine Litter (GPML) meeting (January 2023)
- Ocean Data and Information conference II (March 2023)
- IODE 27 (March 2023)
- Marine debris data harmonization workshop (August 2023)

5.5.1.2 Community surveys and end user engagement.

In May 2023, we opened an end-user feedback form to gather feedback on the global search hub, and the experiences of users in general. The survey is short and remains open.

- We have had 61 user responses up to 1 September 2023

- Country count 3 and over: Colombia, Canada, Belgium, Kenya, Portugal, South Africa
- Sector: 55% scientists, 30% NGOs, 18% NODCs, 15% Govt agencies.
- Gender: 51% male, 49% female



- 60% were users of the content
- 43.3% were users of the technology
- (28.3% replied ***both***)

How are you engaging with the OIH?

- 90% to search and find information that I need
- 70% to share my own institutional data
- 53% to find information about projects
- 51% to find methods and best practices

Have you found what you are looking for? **60% yes**. 40% no OR have not searched yet.

Examples of feedback:

- Performed a couple of searches with the following results: - Very fast!
- The 'Back-button' of the browser does not work

- Searched for specific people/experts using their names and this poped up with correct information. Likewise, searched key terms corals keya and got some recognisable results.
- I haven't searched for information yet
- OIH found all the papers I am aware of for the topic I am researching.
- Spatial data = EurOBIS - should also be linked to EDMED (SDN)
- only text search is used, it is required also to use advanced search taking into account the main metadata attributes.
- Could not get information on the Gulf of Guinea (Bathymetry, Storm surge)
- The results of the search engine are nicely categorized and it's easy to find info.
- I was searching for some very specific data from our own portal that has been ingested by OIH. We're still fine tuning a few things so not too concerned for now.
- I found some information I was looking for but not everything. I did not find my institution, or myself.
- found myself, finally, have been searching for 58 years already

Can you give some examples of other potential USERS of this system in your region?

- Had about 50 responses

Can you name other potential data catalogues/portals or partner organizations in your region that you would like to see as part of the Ocean InfoHub?

- Had about 45 responses

Any other recommendations or comments? About 20 responses, for example:

- I would list more metadata for organisation, like country. I see the json LD contains more metadata so should be possible. For projects the coordinator is important.
- Spatial filter for spatial data/map isn't that great. Would be useful to render search by zoom extent. I.e., only show what is visible at zoomed scale. Else, provide a toggle button that one can use to switch on and off layers.
- Brilliant work!! Really an incredible ocean resource. Well done to OIH team. I'm interested in the spatial datasets and it seems that there is more available online for Africa than is listed. Is that because you can only show partners who have come on board as contributors or can the system point to existing data portals (MASPAWIO or AllanCoralAtlas or Copernicus Marine for example)?
- You know already about needing a sort option; would appreciate under the provider tag an indication of when the data was last updated:
- Thank you very much for the training! We will do our best to include ODIS in all of our presentations about the UN Ocean Decade programming.
- There seems to be a number of duplicates in the individuals section.
- I think must improve the smartphone interface. But i t' s a wonderful Repo of Ocean Data.
- use alphabetic order for the options in each search to facilitate queries

Would you be open to a 5-10 minute discussion in follow-up?

- 73% said yes

What do we do with this information?

- Meeting every two weeks for triage (importance and urgency H/M/L and responsibility)
- Create a Github issue for each action, assigned either to our core tech dev team or to the UI dev team with a timeline.
- Each region is using regional results to respond to specific needs (as presented under WP3).

5.5.1.3 Communication services (social media, website)

- The website is updated frequently and contains news items, media feeds.
- We are currently using the IODE social media channels.
- Three products have been developed together with Sciencecrunchers; a **video**, a **brochure** and a **slide deck (2022)**. These will all continue to be used in outreach and public awareness activities.

5.5.1.4 Awareness raising through communications and events

We use the mailing lists for important communications.
Regular communication uses Slack and email
Also see 4.6.1.1 above

5.5.1.5 Active updates on project progress

Through the website, Slack, Github and infrequent email updates.

5.5.2 Objectives October 2023 – June 2024

Multiple outreach activities ongoing & planned
Including meetings, webinars, conferences and user engagement in all regions, reported under WP3.

Questions and discussion

PP: One suggestion is that we need to think about promoting OIH and ODIS in Google Search rankings.

Via Chat: **JM**: Something interesting, not mentioned yet (about the "elephant' in the room, Google: Stan/Tavita did a test review of trying to find one PDH record in both Google Dataset Search, and in ODIS. Interesting review. Read the report at https://github.com/iodepo/odis-arch/issues/277

Action item: Identify tools and mechanisms to promote OIH and ODIS in Google Search rankings.

TH: Asked about the materials we have. [**TH** provided some very good ideas offline (badges, standard partnership text, pre-written awareness / newsletter items)].

LS: We have been sending them to project participants, and we have them on Google Drive. We have discussed a more concerted effort to send them to physical meetings.

PLB: We should use our Zenodo space for version controlled releases of all our materials, and this would reach colleagues that cannot access Google.

Action item:

JBC: Would be useful if materials should be shared beyond the immediate project – ie a slide deck that is regularly updated that we could all use. Asked about the user statistics – how does that correlate to the user survey?

Action item:

LS: We are tracking usage statistics, and we are tracking searches made – since April. We can also see clicks through to download records. In GA we have users com ing from ±120

countries since November. Our google form was collecting data more recently, with a wide spread of countries. We think the searches can be correlated with country of origin

PLB: This is also an asset for gap analysis – if people are looking for bathymetry data and not finding it, we can go and look for a bathymetry node and help them to plug in. This helps us to get a live view of what users are looking for and finding.

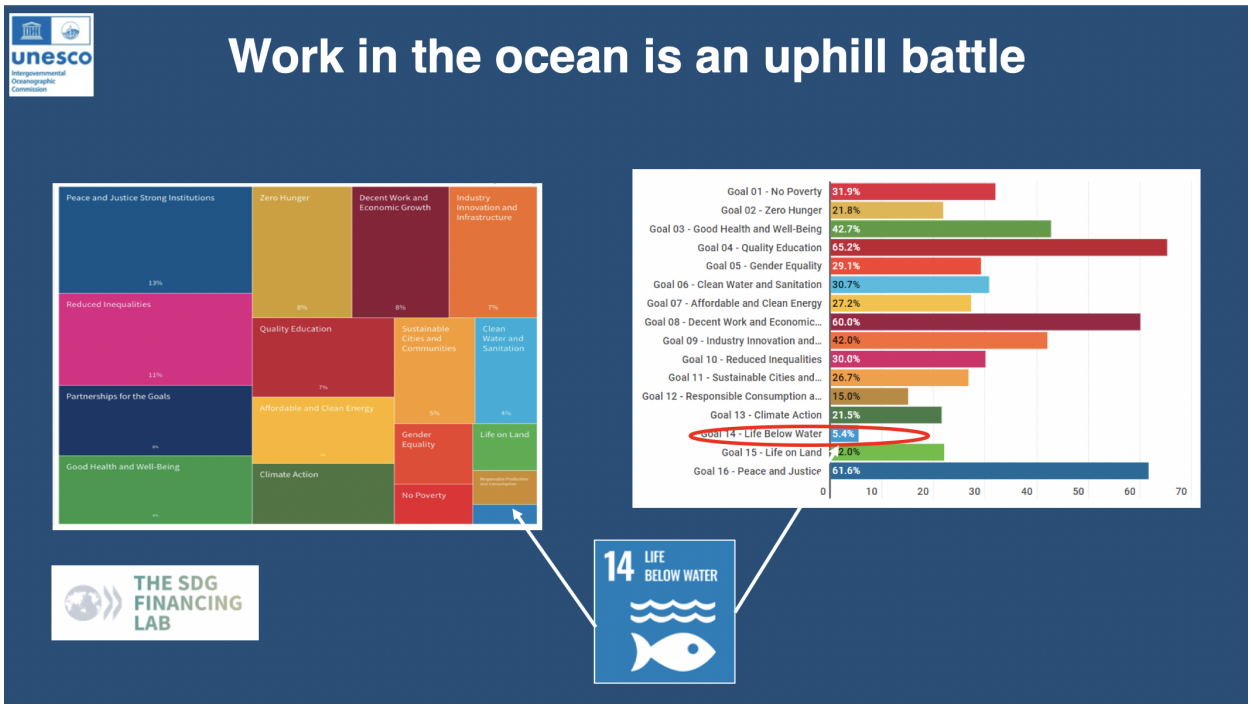
END OF DAY 1

Day 2

6. The Ocean Decade Data & Information Strategy

Louis Demargne presented an overview of the UN Decade Data and Knowledge Management activities.

The Ocean Decade Data and Information Strategy is explained at the following link: https://oceandecade.org/publications/ocean-decade-data-information-strategy-executive-summary/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Intergovernmental Oceanographic Commission
Work in the ocean is an uphill battle
Peace and Justice Strong Institutions
Zero Hunger
Decent Work and Economic Growth
Industry Innovation and Infrastructure
Reduced Inequalities
Quality Education
Sustainable Cities and Communities
Clean Water and Sanitation
Partnerships for the Goals
Affordable and Clean Energy
Gender Equality
Life on Land
Good Health and Well-Being
Climate Action
No Poverty
Goal 01 - No Poverty 31.9%
Goal 02 - Zero Hunger 21.8%
Goal 03 - Good Health and Well-Being 42.7%
Goal 04 - Quality Education 65.2%
Goal 05 - Gender Equality 29.1%
Goal 06 - Clean Water and Sanitation 30.7%
Goal 07 - Affordable and Clean Energy 27.2%
Goal 08 - Decent Work and Economic... 60.0%
Goal 09 - Industry Innovation and... 42.0%
Goal 10 - Reduced Inequalities 30.0%
Goal 11 - Sustainable Cities and... 26.7%
Goal 12 - Responsible Consumption a... 15.0%
Goal 13 - Climate Action 21.5%
Goal 14 - Life Below Water 5.4%
Goal 15 - Life on Land 22.0%
Goal 16 - Peace and Justice 61.6%
0 10 20 30 40 50 60 70
THE SDG FINANCING LAB
14 LIFE BELOW WATER


The science we need, for the ocean we want
2021 2030 United Nations Decade of Ocean Science for Sustainable Development
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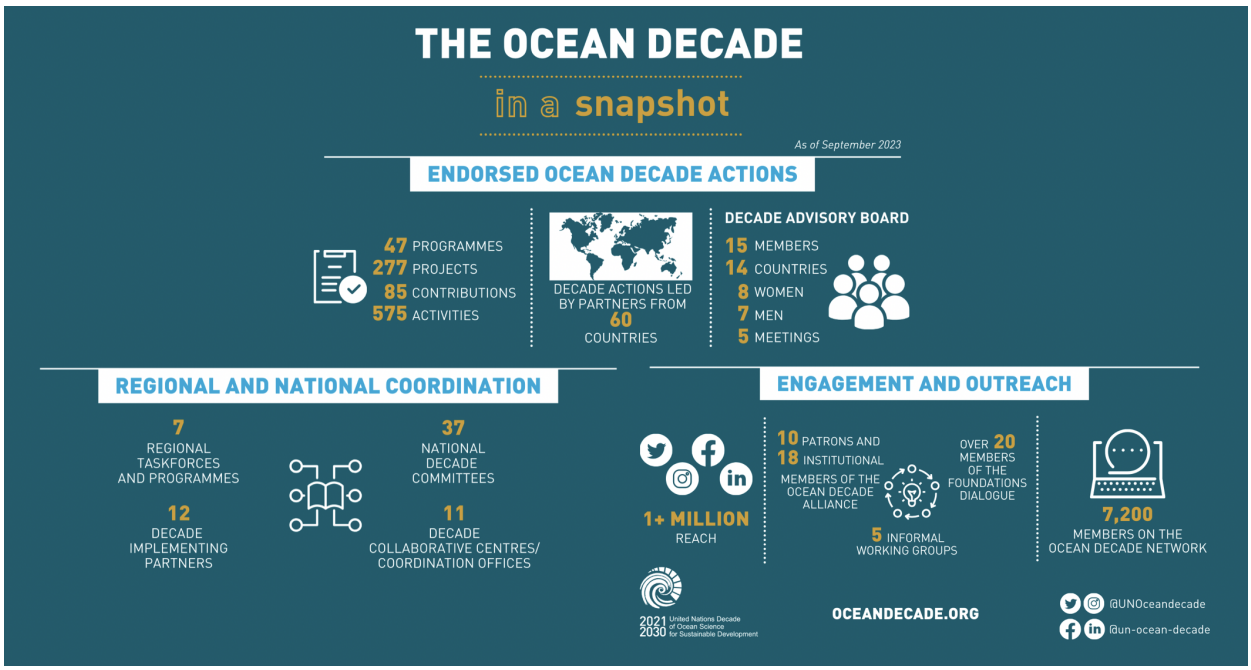
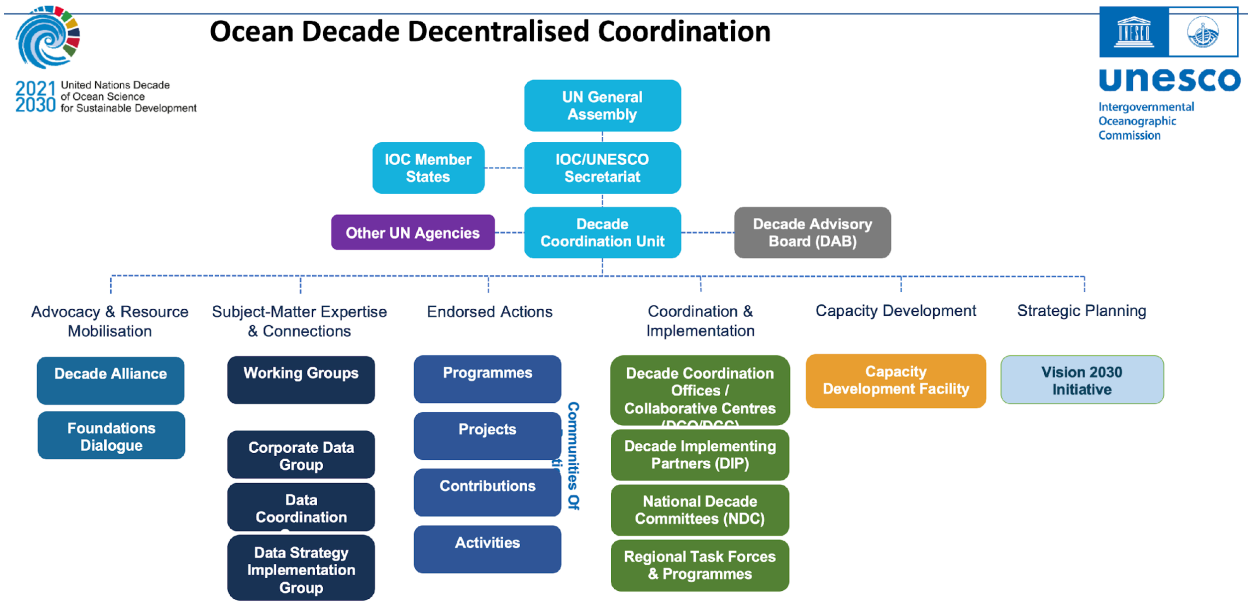
Intergovernmental Oceanographic Commission
2030 AGENDA & REGIONAL AND GLOBAL POLICY FRAMEWORKS
DECADE OUTCOMES
"THE OCEAN WE WANT"
OCEAN DECADE CHALLENGES
The most immediate and pressing needs of the Decade, Challenges may evolve throughout the Decade and new Challenges will be added. Each Challenge contributes to one or more Decade outcomes.
DECADE OBJECTIVES
The steps in the process from the ocean we have to the ocean we want. Objectives are relevant to all Challenges. Prioritisation and translation of objectives into Actions will vary depending on context.
DECADE ACTIONS
The tangible initiatives and endeavours that will be implemented by a wide range of Decade stakeholders to fulfil the objectives and thus achieve the Challenges.
Knowledge & Solutions Challenges:
1. Marine Pollution
2. Protect and Restore Ecosystems
3. Sustainable Blue Food
4. Sustainable Ocean Economy
5. Ocean-Climate Nexus
Infrastructure Challenges:
6. Community Resilience
7. Ocean Observations
8. Digital Ocean
Foundational Challenges:
9. Capacity Development
10. Behaviour Change
Programmes, Projects, Activities and Contributions





The Data and Information Strategy

Data, information & knowledge are cornerstones of the Ocean Decade's success

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1. Understand and beat marine pollution
2. Protect and restore ecosystems and biodiversity
3. Sustainably feed the global population
4. Develop a sustainable and equitable ocean economy
5. Unlock ocean-based solutions to climate change
6. Increase community resilience to ocean hazards
7. Expand the Global Ocean Observing System
8. Create a digital representation of the Ocean
9. Skills, knowledge and technology for all
10. Change humanity's relationship with the ocean

An opportunity to lift all components of the data flow and value chain

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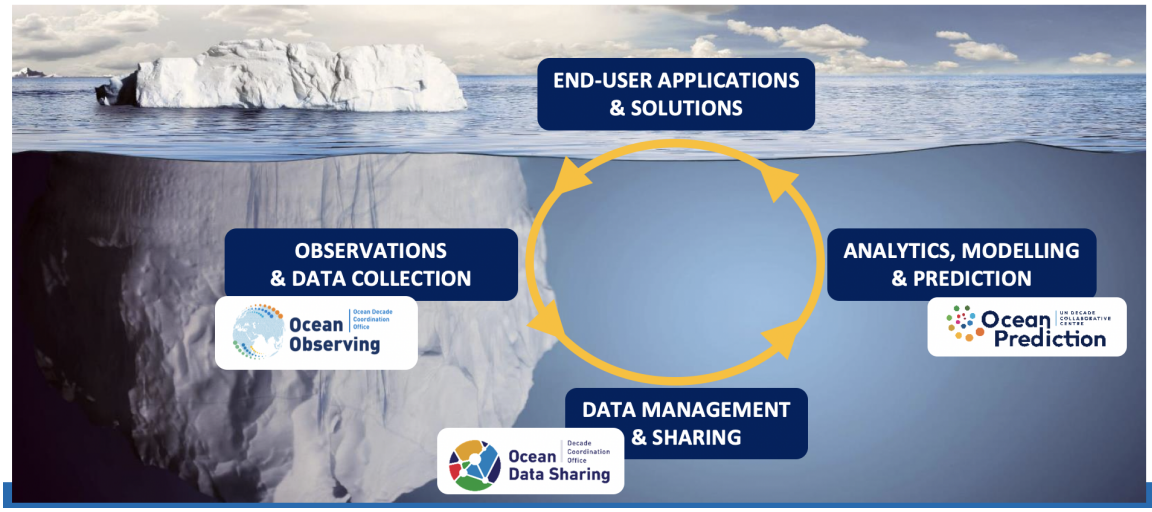

Coordinating the implementation of the Data & Information Strategy

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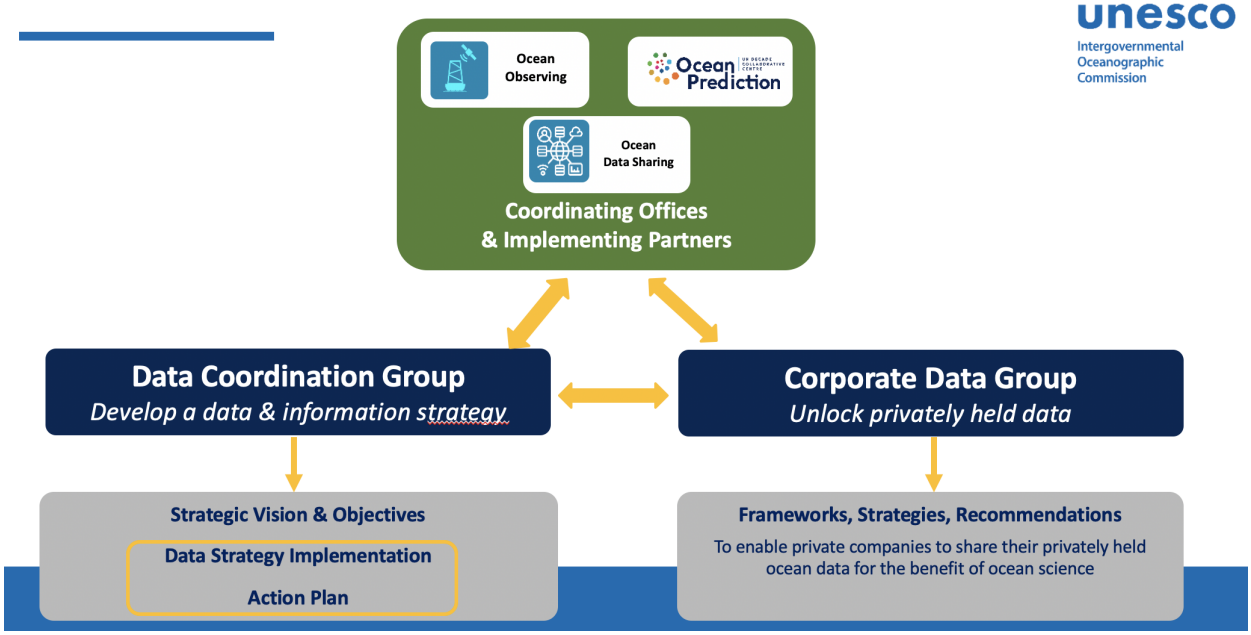

Ocean Decade – Data and Information Strategy process 2021–24

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Assess current situation

- Establish Data Coordination Group (DCG) of global experts – Dec 2021
- Gathered facts:
  - DCG online meeting discussions
  - survey of Decade endorsed Actions – needs and gaps
  - Identify existing initiatives / strategies, to leverage
  - IODC conferences
- Conducted SWOT analysis
- Identified strategic priorities to address

Formulate strategy

- Defined overarching vision
- Developed key strategic objectives to achieve vision
- Identified key enablers and other existing resources that are essential to the strategy's success
- Conducted two DCG workshops to develop draft version of strategy
- Conducted a draft review and consultation with Decade programme leads, DCCs / DCOs, DIPs and partner UN organisations (ISA, IHO, etc.)

Build Action Plan

- Established the Data Strategy Implementation Group
- Develop statements and recommendations of steps and actions required
- Identify priority data required (through Vision 2030 process)
- Draft Action Plan including estimate of resources required and data agos to fill.
- Define goals, timelines and metrics to track
- Establish a communications plan (media, workshops, etc.)

Implement & Monitor

- Roll out action plan
- Implement communication plan
- Set tools to track and report progress
- Adapt strategy as needed on regular basis

Ocean Decade Data and Information Vision and Strategic Objectives

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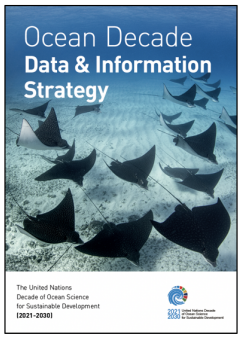

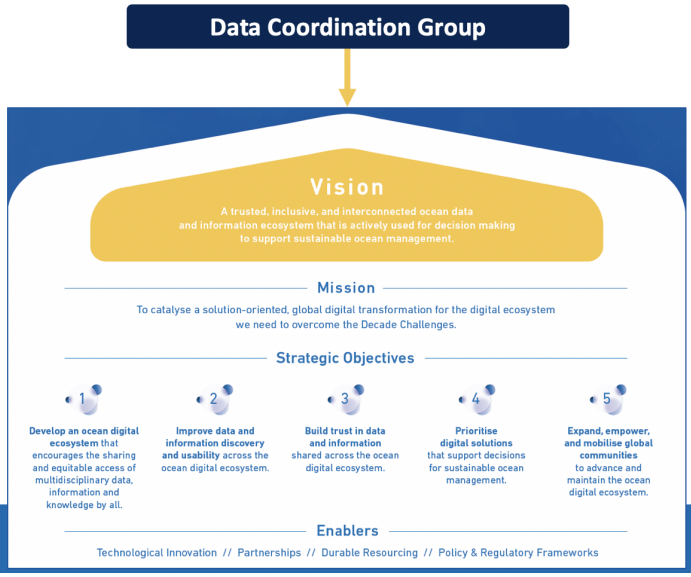

Download here:

Five Strategic Objectives

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OIH
Ocean InfoHub

1. Establish a globally distributed ocean digital ecosystem allowing sharing and equitable access of multidisciplinary data, information and knowledge by all
2. Improve data and information discovery and usability
3. Build trust in data and information shared across the digital ecosystem
4. Prioritize digital solutions that support decisions for sustainable ocean management
5. Expand, empower, and mobilize global communities to advance and maintain the ocean digital ecosystem

Prioritising: the right data and information, to the right people, at the right time

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Data Coordination Group
Develop a data & information strategy

Vision 2030
Ambition setting for 10 Decade Challenges

Corporate Data Group
Unlock privately held data

Priority datasets, data and capacity gaps

Communicating about the Strategy

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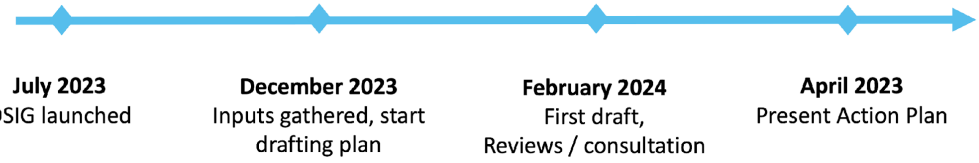
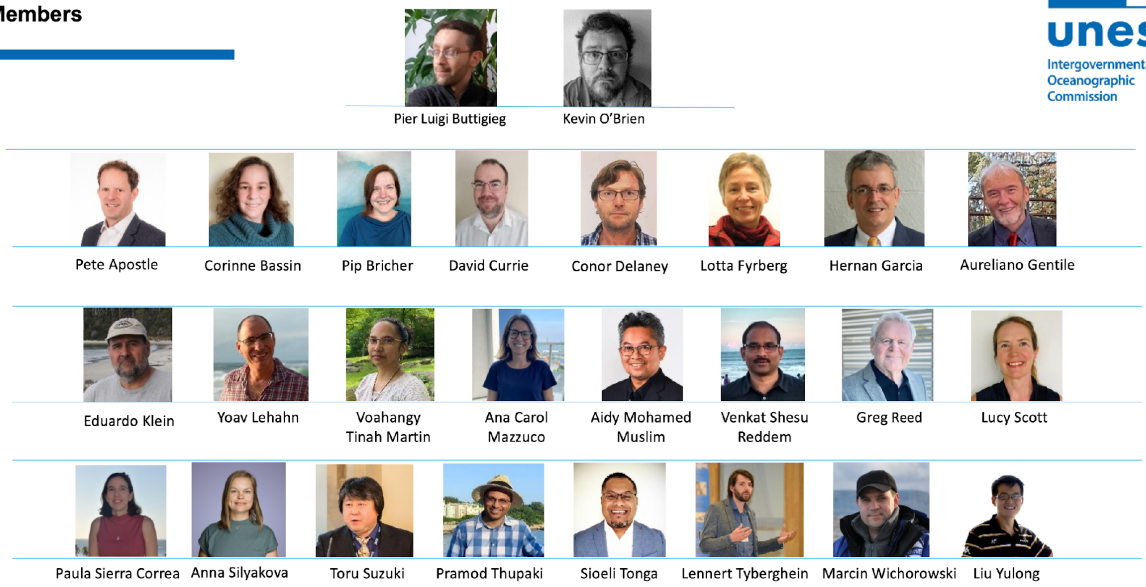
- Translation into multiple language
- Present at various events and conferences
- Coordinating closely with DCOs and DCC and Vision 2030
- Ocean Decade Conference - April 2024

Develop an Action Plan



- Actions, steps, resources needed to achieve strategic goals by 2030
- Align Decade-endorsed Actions with strategy
- Ambition to leave a legacy that endures beyond 2030

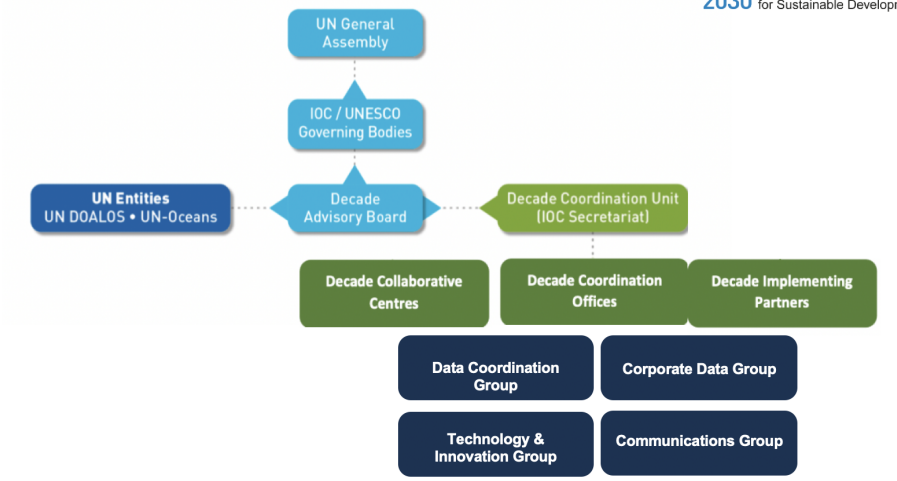
Data Strategy Implementation Group Members



7. The Ocean Decade Data & Information Strategy & The Decade Coordination Office (DCO) for Data Sharing

Jan-Bart Calewaert presented an overview of the DCO for Data Management.

Building a decentralized coordinating structure for the Ocean Decade



What will the Coordinating Offices do?

- Support links and information flow
- Avoid duplication of effort
- Enable cross-disciplinary co-design
- Provide strategic advice
- Encourage the development of technical and scientific capacities
- Address data gaps and infrastructure needs
- Raise awareness of ocean observing and data literacy
- Develop partnerships
- Communicate successes

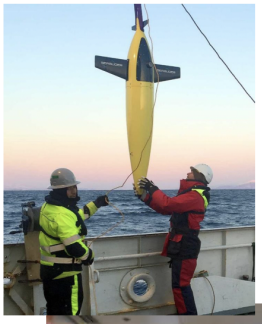


Photo: Kongsberg

DCO for Ocean Data Sharing

Ocean Data Sharing — Decade Coordination Office

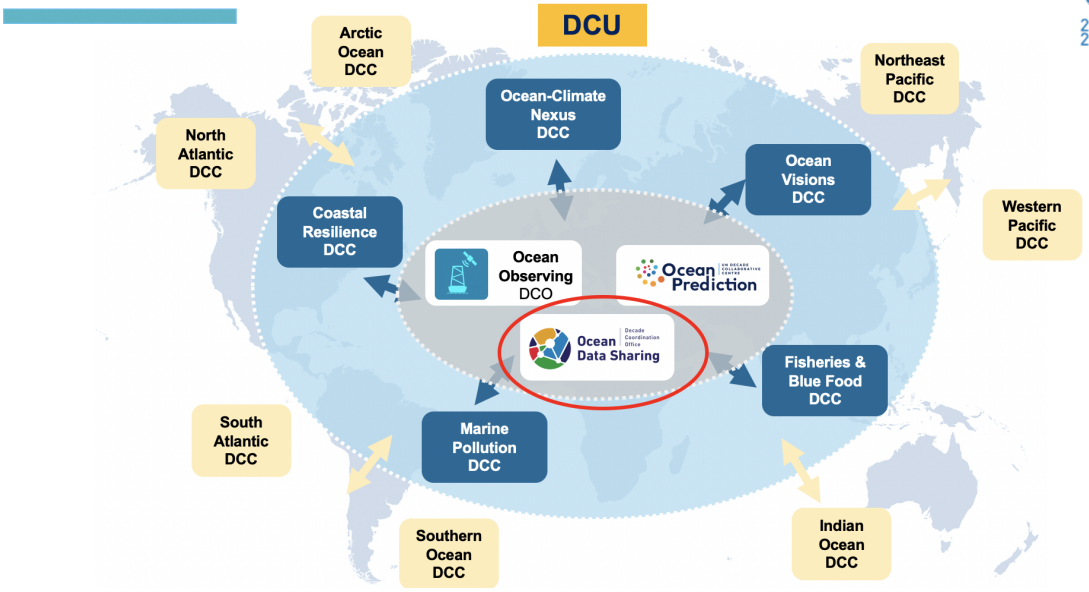
unesco — Intergovernmental Oceanographic Commission

- **Coordinate the data-sharing component of the digital ecosystem** for the Ocean Decade
- **Develop data literacy and capacity equitably** among all IOC Member States.
- **Assist Decade collaborators with data sharing guidance** to achieve the highest possible data quality and adherence to FAIR and CARE principles.

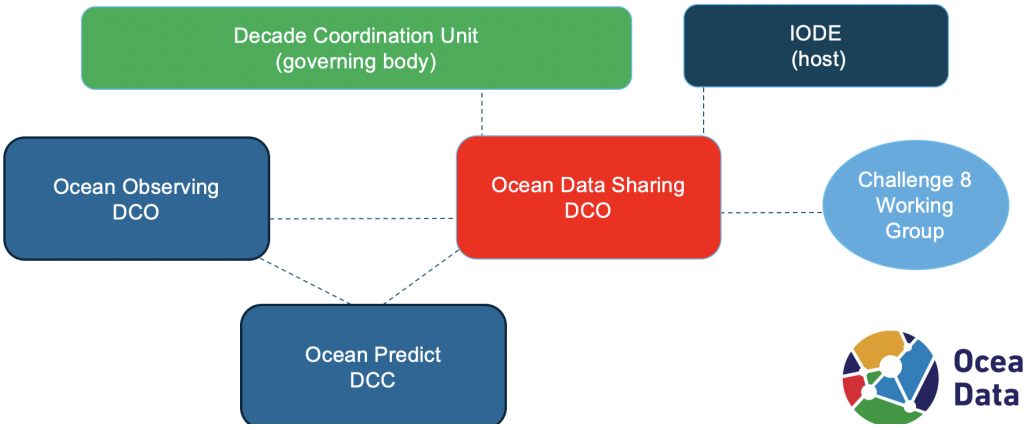
Photo: Ocean Image Bank

Working alongside other Coordinating Offices across disciplines

2021 2030 United Nations Decade of Ocean Science for Sustainable Development



Ocean Data Sharing DCO – core relationships



Year 1 Priorities

1. **Establish the DCO for Ocean Data Sharing** (work plan, staff, reporting)
2. Stakeholder engagement at three levels:
   - Decade coordination bodies: to ↑ synergies & ↓ duplication of efforts
   - **Decade Actions** to: support data-sharing and promote best practices
   - Wider stakeholders: year 1 prioritise potential funders
3. **Support and facilitate the Challenge 8 Expert Working Group** in the Vision 2030 process
4. Raise visibility and awareness of the DCO for Ocean Data Sharing
5. **Mobilise resources for continuation beyond 2024**

Status Update

Establish the DCO for Ocean Data Sharing (work plan, staff, reporting)

Ocean Data Sharing DCO **launched in June 2023** and now operational
Resourced for 11 months (April 2024)
Hosted by IOC of IODE
Lead and 2 support staff (=1.5 FTE, more staff needed)
Year 1 work plan prepared, monitoring and reporting ongoing

Stakeholder engagement: Support Decade Actions

Mapping Decade actions to identify data-relevant Actions
Compiling a suite of data management resources
Provide support to Decade actions with data management resources
Exploring the need for & potential of an online Actions Database
Contact initiated & meetings held with **4 Primary Attached Actions**
Ocean Data and Information System (Programme, Lead: IODE)
Digital innovation Hand-in-Hand with **fisheries and ecosystems scientific monitoring** (Programme, Lead: FAO)
World Ocean Database Programme (WODP): (Contribution, Lead: NOAA)
GEOTRACES (Contribution, Lead: U.S. National Science Foundation on behalf of international GEOTRACES partners)

Support and facilitate the Challenge 8 Expert Working Group in the Vision 2030 process
https://oceandecade.org/vision-2030/

A strategic ambition-setting process to identify what success looks like for Challenge 8:"***Create a digital representation of the ocean***"

Co-chairs appointed (XX) and members invited in June 2023
Organised and facilitated three WG8 meetings (July, August & Sept) and two drafting group sessions (Sept)
Developed a narrative for the White Paper
Towards presenting the Draft White Paper at the UN Ocean Decade Conference in Barcelona, April 2023

4. Raise visibility and awareness of the DCO for Ocean Data Sharing

- Participation in key events
- Highlighting Action success stories
- Mobilising a Community of Practice (coming in 2024)

- **Mobilise resources for continuation beyond 2024**
  - In kind (staffing, secondments)
  - Identifying opportunities for sustained funding: private sector and philanthropic

Legacy
Contribute to the Implementation of the Decade data and information Strategy to:

Transform data management & sharing
Promote a cultural change across all disciplines
Enable a federated ocean digital ecosystem
Make it easier for everyone (science, citizens, blue economy and public bodies) to find, access and share data
Provide the data, services and information to:

- Fill knowledge gaps
- Enable decision-makers to make informed choices
- Promote ocean literacy
- Support a sustainable blue economy
- Address the global challenges we face

Questions and Discussion

DF: What would be the best way to share this information – contacts and website?

JBC: We should use every opportunity to raise awareness while also manage expectations. We have someone joining the team very soon to help with the facilitation of stakeholder engagement. JBC will share links to the websites and strategy.

Action item: JBC to share key links to Decade websites, materials and strategy.

PLB: In the vision 2030 process, why was the word 'appropriate' chosen? We need to be careful as sometimes words can be used to suppress information.

JBC: While still important, the word was used to refer to tools and the process itself, not the data. The Vision 2030 development will be a process in itself to reach consensus, in wording etc. The DCO is a facilitator to make links between parties.

TH: Raised a question about referring to suitability of data; as someone who is reading metadata to determine its suitability for local use, that suitability will be determined by the end user and not by the data provider / sharer. So suitability is determined by the consumer.

PLB: Similarly in EOVs, not all data generated for a category is actually appropriate for the EOV process (due to certain lacks in metadata).

8. OceanData-2030

Pier Luigi Buttigieg presented an overview of OceanData-2030.

- The programme was registered as a Decade Programme, and your advice is now sought to help us steer this. The DCO can also help in a coordinating role, and we have coordination networks.
- We need to define OD-2030 as a common interface to the Decade.
- We need to keep the Admin load light.
- *Those who have visions should see a doctor immediately (*Helmut Schmidt). We need to be the doctors and respond to the visions…. Turn the cynicism into opportunity
- As an example, OBON stakeholders want clear guidance on what OBON does to help their data management – the added value of the decade programme. The added value is connection and alignment.
- OD2030 can be the vehicle we can use to give people advice on sharing their data. We can manage partner actions as activities or contributions.
- Everything in an ecosystem has a niche; we need to decide how to steer this OD2030 vehicle and ensure that it adds value.

Questions and discussion

JBC: We need to be clear on the vision for OD2030 and how it is different to ODIS, and how they are complimentary. Different clouds have different systems and capacities – is it about bringing clouds closer together?
PLB: OD2030 should be a broader umbrella for many reasons. There is regional and thematic specificity. System to system interfaces already exist (WIS2-ODIS-FAO) and we can build on this.
PP: UN Decade is not an IOC Decade. ODIS could be the IOC cloud; OD2030 could be more of an umbrella – a higher level federation including other systems. It could be a gradual process, not using ODIS technology at first, but perhaps linking clouds up at a later stage.
PLB: We are taking ODIS to the CoData CDF – it works well and it's extensible. So yes we can do this. OD2030 can be a vehicle to bring DM together from other groups – this also helps the DCO work. Every DT needs an integration layer, initially there was to be some duplication but now there is better coordination. So yes, we can position this as a programme to programme coordination entity that can help the DCO.
JBC: Essential that these programmes coordinate- the DCO can provide a platform for these programmes to meet (the ones with a very strong data component). Where OD2030 could help is to set up a governance structure, or even just a connection to explore the umbrella concept. DCO can assist with that, but it would fall under OD2030.
LS: The vision of something broader and more cross-domain than ODIS does make sense, but we do also need to be pragmatic about what we can do with no additional resources or capacities – so we should have a clear work plan that goes beyond the existing capacities in the OIH Project. And/or develop strategies to raise funds.
PLB: Agreed, also perhaps funding can also be used from other projects, to help to bring certain groups together.
MG: In addition to bridges, you're actually building an infrastructure. The actual achievement is compared to building the railway tracks that different companies use to move people (data) around, no matter where they come from. The borderless goal behind the technology shouldn't be forgotten.Don't limit the technology.

PLB: We have thought about that, for example nodes can implement their own borders. Partners can have a presence without committing fully, to allow for their operational constraints. In the implementation document, for example, we state if you can join ODIS, please join. If you can't join now, we would still like to interact with you via OD2030.
JN: OD2030 would give people an opportunity to link that can't join ODIS, but a lot of confusion remains around all the different offices and Decade instruments
HO: There are opportunities in our region, for example the Nairobi Convention is developing an information management strategy. IOCAfrica and NC might be serving different ministries but there is overlap, and we need to make sure these different initiatives do interact with each other.
PLB: Almost all programmes and projects in the decade talk about getting information to decision makers, but very few people know how to do that. What is appropriate / in what form. End users could request certain forms, and then data providers could respond more easily to those needs. Would be no need to join technical infrastructure.
JF: Two areas of more effort could be a) more endorsed Decade projects relevant to data, b) better coordination between global and regional coordination offices for the Decade.
LS: Additional actions would be important, but how do we relate to the hundreds of other actions registered under other programmes – it is a complex space for OD2030. We need a clear message, otherwise we are going to be complicating the environment even more.
PLB: We can talk to their DM teams and provide a space for formulating agreement.
KO'B: Clarity would be very welcome – either as a DCO or OD2030 role or both. There is a lot of confusing information out there. We have an opportunity to clarify and provide guidance.
LD: We have had a challenge of indigenous and local knowledge – how d o we bring this into the digital strategy and how do we bring this information in. If we could use OD2030 to address this point, it would be very useful.
PLB: This is important, there is a huge diversity of communities and data systems. OD2030 could talk about and actively support CARE principles, supporting other programmes.
LS: We could Identify the 2-3 core functions that OD2030 could support, and then wait for the DSIG-AP and leave some space for linking to the DSIG-AP, and support/alignment.

JBC: Now is the time to clarify Decade structures better, a 2-pager of key functions would help yes, DCO can help to try to secure extra funding. Even if this is seed money it could help.
PLB: We need a compelling message; we now have the ODIS dashboard, but if we could work towards a OD2030 Dashboard and a Decade dashboard – that could be the basis for SOE reports reporting on Ocean Data.
PS: Hope to have OBPS recognised as a partner and component in OD2030.
PLB: Certainly, firstly through the links between IODE Programmes and especially as OPFN is a sub network of ODIS. Methodology is a key patt of this. OBPS and other key partners in OPFN will help the processes align as much as possible.

Action item: Expand on the OceanData-2030 concept doc, including specific actions discussed here, and associated budgets in order to look for additional support.

• 9. Summary of additional Actions from SG-OIH-III

• We should develop a short text around ODIS, OIH and ODIScat to clarify their relationship.
This was done, and used together with a new slide (in all OIH presentations) showing the relationship between ODIS-cat, ODIS and the OIH Project.
• Follow up with SPREP and OIH usage to inform State of the Environment reports at national Level
This was incorporated in the ToR for the PSIDs consultant, to investigate and report on OIH usage within the PSIDS region.
• Follow up with OIH integration with the World Ocean Database.
This has been done

• Follow up with the PSIDs region for examples of decision-grade data or products and formats that decision-makers have requested.

This was incorporated in the ToR for the PSIDs consultant

• Develop a communications course or course component that assists existing and potential users and providers – and for managers and decision-makers.

This will be incorporated into the Global Search Hub front end (contract just commenced) for end users

• Consider ODIS training in-person, B2B or as part of an event.

This will continue to be considered when cost effective opportunities arise (ideally when no or minimal additional travel costs are required)

• Consider doing a Global Search Hub pre-launch to get the perspective of the core partners, then consider some dates in 2023 to have a launch event, at IODE-27 and the associated Conference, with a sales desk for more information and to get more partners involved. Also consider an event at the IOC Assembly in June.

We decided on a soft launch approach, and all of the above events (IODE-27, IODC and the IOC Assembly) were used to raise the visibility of OIH and ODIS.

• Lucy to email all participants for ideas of dates and events where OIH may be present.

That was done, and a follow-up also sent. Results were used to select dates for this meeting (OIH-SG-IV)

• Project evaluation: We should develop a short ToR for the self-evaluation, and establish a small group of colleagues that could work on the ToR and help with the self-evaluation.

Done, and self-evaluation complete

• In the list of contributions from the Ocean InfoHub to the Ocean Decade, include a reference to the IOC strategy on capacity development and knowledge transfer.

I believe this is done (https://oceandecade.org/news/flanders-funds-new-initiative-to-support-capacity-dpvt-as-part-of-ocean-decade/) although I cannot find a list of contributions as mentioned above.

• Make presentations and project materials (brochure and final video) available to project partners.

Done – circulated widely

• Lucy to follow up with Jan-Bart regarding the Corporate Data Group

Done, but should be looked at again in light of additional links via the DCO and DSIG

• Together with SPC and SPREP, develop some materials that we could demonstrate at a new 5-country project meeting; early 2023; what OIH is doing and some critical features.

Materials were shared; Paul Anderson departed SPREP

• Follow up with SPREP and other regional seas bodies to enhance links

Follow up was done and additions were made to the PSIDs TOR.

• Work with OBIS as a user node as well as a contributor.

Instead of the original suggestion (to make an OIH entry point via OBIS), we worked with the OBIS and GOOS teams to support the development and discovery of EOVs and to look at options for strengthening the GOOS BioEco Portal

• Awareness materials to be developed as required; postcards with QR codes and stickers are a priority.

Done and disseminated at various meetings

• If there are any proposals for changes to the project, or key issues that need to be discussed, information should be shared together with the agenda of the SG meeting ± one month in advance of the next meeting.

This annotated agenda has been shared; no major changes to the project have been identified.

• All participants will be requested to share a list of meetings, either for OIH user engagement or to consider for the Steering Group meeting (back-to-back). Note: please avoid the international data week 23-27 October 2023.

Done

• Would it be possible to extract machine readable data from international funders and produce a product that can be used for reporting. (Follow up PA, LS, PLB and PP).

This was looked into – unfortunately PA who made the request, left SPREP within days of OIH-SG-III so he was not available to further guide any product development. Pacific Ocean Initiatives Registry has done this to some extent

Questions and discussion

JD: The link shown mentions the contribution to the Decade CD strategy, but we should make sure that contributions to the IOC CD strategy are also clarified. Perhaps through the IOC CD website.

Action item: Add text to the IOC CD website as needed, to reflect OIH/ODIS contributions

• 10. Election of the chair

Lucy expressed gratitude to Harrison for leading us for the past two sessions and called for any expressions of interest from the floor to join Harrison as a co-chair.

PLB suggested that perhaps a co-chair could volunteer from the Pacific region to support the momentum developing in that region. This was accepted.

FA: Volunteered a co-chair from the LAC region (Carolina Garcia)

Resolution: Three co-chairs are now in place, one from each region:

- Harrison Ong'Anda – Africa
- Tavita Su'A – Pacific
- Carolina Garcia - LAC

• 11. Next meeting: Final OIH Project meeting (TBC)

It has been considered that we hold a final project meeting. There are two factors to consider – the final remaining budget (which we will know next month), to see whether we can support a physical or hybrid meeting. Our alternative is a virtual meeting. We are considering some time during the month of May, as the UN Decade meeting in Barcelona is in April, and the OIH Project closes in June. We could look at dates, and then as soon as we know our remaining budget we could look at options for hybrid or virtual options.

Questions and discussion

FA: offered to host a final meeting at INVEMAR in Santa Marta, if a physical meeting were possible, dependent on the budget.

LS: Thanked INVEMAR very much for the offer of co-chair and hosting of the final meeting.

HO: Proposals are taken on board with thanks.

• 12. Thanks and close of the meeting

Lucy thanked the IODE Secretariat, colleagues from DCO and DCU, OIH Project team and partners, Chair, and all of those who have travelled so far to be here, and again thanks to the Government of Flanders Kingdom of Belgium, for supporting the Project.

PP: We have had a great opportunity to see all the work that has been done under the hood, by the technical teams and three regional teams. It is clear that you've done an excellent job in establishing a platform for the Decade data ecosystem. A small group and budget has achieved quite a lot.

PLB: thanked Lucy for the Project Management and Jeff for the partner work.

HO: Thanked the participants, wished them a safe journey and closed the meeting.

ANNEX 1

Fourth Session of the IODE Steering Group for the Ocean InfoHub Project

Provisional Agenda: 4-5 October 2023

4 October 2023 (all times in CEST)	
09h30	Arrival on site, tea and coffee
10h30-12h30	Session 1
	Opening of the meeting (Vladimir Ryabinin and Gert Verreet) Administrative arrangements (Sofie De Baenst) Adoption of the agenda (Harrison Ong'Anda) Overview of the OIH work plan and deliverables (Lucy Scott and OIH team) WP 1 : Project management, coordination and evaluation WP 2 : Technology development
12h30 - 13h30	Lunch
13h30 - 14h30	Special session: OIH and MAREGRAPH cooperation
14h30 - 16h00	Session 2
	WP 3 : Establishment and initial support of the global hub and regional nodes, including end-user engagement in the three regions WP 4 : Training and Capacity Development WP 5: Communication (including end-user engagement)
16h00	Tea and coffee

5 October 2023 (all times in CEST)	
09h30	Arrival on site, tea and coffee
10h30-12h30	Session 3
	UN Decade Data and Knowledge Management activities (Louis Demargne) Decade DCO for Data Management (Jan-Bart Calewaert) OceanData-2030 (Pier Luigi Buttigieg)
12h30 - 14h30	Lunch
14h30 - 15h30	Session 4
	Election of the Chair Next meeting: Final OIH Project meeting TBC Thanks and closing
15h30	Tea and coffee

ANNEX II

Summary of Additional Actions

1. ODIS will need to look into how to deal with multiple languages.

2. Lucy to follow up with Ann-Katrien to make a link to EU Mission Ocean.

3. Identify tools and mechanisms to promote OIH and ODIS in Google Search rankings.

4. JBC to share key links to Decade websites, materials and strategy.

5. Expand on the OceanData-2030 concept doc, including specific actions discussed here, and associated budgets in order to look for additional support.

6. Add text to the IOC CD website as needed, to reflect OIH/ODIS contributions

ANNEX III

LIST OF PARTICIPANTS

Event: **Fourth Steering Group meeting of the Ocean InfoHub Project**
Dates: 2023-Oct-04 to 2023-Oct-05

Other

Ward APPELTANS
Project Manager OBIS, GOOS Biology & Ecosystems, IOC Capacity Development
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +32 485 473103

Leonardo Jose ARIAS ALEMÁN
Scientific investigator
Information Service Laboratory - LabSIS
Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andreis
Calle 25 No. 2-55, Playa Salguero, Rodadero
Santa Marta D.T.C.H., Magdalena,
Colombia
Tel: +57 3008144587

Francisco ARIAS-ISAZA
General Director
INVEMAR General Director
Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andreis
Calle 25 No. 2-25, Playa Salguero, Rodadero
Santa Marta, Magdalena, 470006
Colombia
Tel: +57 3183524790

Pier Luigi BUTTIGIEG
Data Scientist
Helmholtz Metadata Collaboration
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Duesternbrooker Weg 20
24105 Kiel
Germany
Tel: +494212028984

Jan-Bart CALEWAERT
Lead Manager of the Decade Coordination Office for Data Sharing
Decade Coordination Office (DCO) for Ocean Data Sharing (ODS)
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

Tel: +32 497 43 33 71

Sofie DE BAENST
Administrative Assistant
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

Taco DE BRUIN
Scientific Data Manager
National Marine Facilities
Koninklijk Nederlands Instituut voor Onderzoek der Zee
PO Box 59
1790 AB Den Burg
Netherlands
Tel: +31 (0)222-369479

Cláudia DELGADO
Marine Training Unit Coordinator
Universiteit Gent, Marine Biology research group
Campus Sterre - S8
Krijgslaan 281
9000 Gent
Belgium

Louis DEMARGNE
Data & Knowledge Management Officer
Decade Coordination Unit
Intergovernmental Oceanographic Commission of UNESCO
7, place de Fontenoy
75732 Paris cedex 07
France
Tel: +31655855501

Johanna DIWA
IOC Consultant
Capacity Development
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

Vicente FERNÁNDEZ
Science Officer
Seascape Belgium
Kindermansstraat 14, bus 19
1000 Brussels
Belgium Tel: +32484400067

Douglas FILS
Independent Consultant
407 10th Ave Circle

Slater, IA
United States
Tel: +1-515-981-6090

Julius FRANCIS
Executive Secretary - WIOMSA
Physical and Applied Marine Sciences
Western Indian Ocean Marine Science Association
Mzingani Street, House No. 13644/10P.O. Box 3298
Zanzibar
Tanzania
Tel: 255-024-2233472

Katarina Lotta FYRBERG
Co-Chair IODE 2023-2025 & Marine Data Manager
Oceanographic Unit
Sveriges meteorologiska och hydrologiska institut
Folkborgsvägen 1
SE-601 76 Norrköping
Sweden
Tel: +46 31751 8978

Jhonny GARCES ORTEGA
Head of Information Services Laboratory
Santa Marta
Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andreis
Calle 25 No. 2-55, Playa Salguero, Rodadero
Santa Marta D.T.C.H., Magdalena,
Colombia
Tel: +573136338368

Carolina GARCIA VALENCIA
Information Analysis for Planning Chief
Research and Information for Marine and Coastal Management
Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andreis
Calle 25 No. 2-55, Playa Salguero, Rodadero
Santa Marta D.T.C.H., Magdalena,
Colombia

Dany GHAFARI
Programme Management Officer
Science Division
United Nations Environment Programme, Environment for Development, Kenya
United Nations Avenue, Gigiri
Nairobi
30552, 00100
Kenya
Tel: +254790569931

Tanya HADDAD
Information Systems Specialist
Department of Land Conservation and Development
Oregon Coastal Management Program

800 NE Oregon Street, Suite 1145
Portland, Oregon 97232
United States
Tel: +19716730962

Lorna INNISS
IOC Secretary for IOCARIBE
IOC of UNESCO Sub-Commission for the Caribbean and Adjacent Regions
Torices, Edificio Chambacu, Oficina 405Cra 3B # 26-78
Cartagena de Indias, Bolivar, 1108
Colombia
Tel: +246 2285950

Arno LAMBERT
IT Services Manager
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +32 (0)59 34 14 62

Ann-Katrien LESCRAUWAET
Director International Relations
International Relations
Vlaams Instituut voor de Zee
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +32475493452

Vladimir MALUF
SUPERINTENDENT OF ENVIRONMENTAL INFORMATION
Banco Nacional de Dados Oceanograficos (BNDO)
Brazilian Navy Hydrographic Center, Directorate of Hydrography and Navigation
R. Barão Jaceguai s/n
Niterói, Rio de janeiro-
CEP 24048-900
Brazil
Tel: +55 21 993921836

Ana Carolina MAZZUCO
IODE Training Coordinator – OTGA Project Coordinator
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +5527981828583

Jeff MCKENNA
Director
GatewayGeo

1101 Blue Rocks Road
Lunenburg Nova Scotia B0J 2C0
Canada

Yutaka MICHIDA
The University of Tokyo, Atmosphere and Ocean Research Institute
5-1-5 Kashiwanoha
Kashiwa, Chiba
277-8564
Japan
Tel: +81 4 7136 6362

John NDARATHI
Research and Data Cordinator
IOC's Sub Commission for Africa & the Adjacent Island States (IOCAFRICA)
UNESCO/IOC Sub Commission for Africa and the Adjacent Island States
UNESCO Nairobi Office
UN Gigiri Complex Block CP.O. Box 30592
Nairobi
00100
Kenya
Tel: +254726141740

Harrison ONGANDA
Research Officer
Research
Kenya Marine and Fisheries Research Institute, Headquarter & Mombasa Station
PO Box 81651
Mombasa
080100
Kenya

Stanislas OZIER
Solution Architect
Pacific Data Hub
Pacific Community
95 Promenade Roger Laroque
BP D5
98848 Nouméa Cedex
New Caledonia

Peter PISSIERSSENS
Head, IOC Project Office for IODE, Oostende, Belgium and IOC capacity development coordinator
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +32 59340158

Marc PORTIER
Open Science Team Lead

VMDC
Vlaams Instituut voor de Zee
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +32 476 473633

Pieter PROVOOST
OBIS Data Manager
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +32 59 340161

Greg REED
IOC consultant
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +61 43 2047 550

Lucy SCOTT
Ocean InfoHub Project Manager; Marine Scientist
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +27 (0) 82-879-5006

Sophie SEEYAVE
CEO
Partnership for Observation of the Global Ocean
Plymouth Marine Laboratory
Prospect Place, The Hoe
Plymouth
PL1 3DH
United Kingdom
Tel: +44 1752 633424

Paula SIERRA-CORREA
Co-Chair IODE 2023-2025 & Research and Information Coordinator
Research and Information for Coastal Zone Management
Instituto de Investigaciones Marinas y Costeras José Benito Vives de Andreis
Calle 25 No. 2-55, Playa Salguero, Rodadero
Santa Marta D.T.C.H., Magdalena,
Colombia

Pauline SIMPSON

IOC Consultant
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium
Tel: +44 7715 113930

Tavita SU'A
Environmental Information Systems Developer and Analyst
Environmental Monitoring and Governance
Secretariat of the Pacific Regional Environment Programme.
PO Box 240
Apia
Samoa
Tel: +68521929

Gert VERREET
Policy Advisor
Vlaamse Overheid - Departement Economie, Wetenschap & Innovatie, Afdeling Onderzoek
Koning Albert II-laan 35 bus 10
1030 Brussel
Belgium
Tel: +32 499 59 49 83

Group Photograph