



United Nations
Cultural Organization



Intergovernmental
Oceanographic
Commission



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



Flanders
State of the Art



The Ocean InfoHub Project

The International Conference on Marine Data and Information Systems

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Introduction



- The IOC Ocean InfoHub Project (OIH) is a new, global initiative, to improve access to marine and coastal data and information.
- It is a three year project, commencing April 2020
- The project is funded by the Government of Flanders (Kingdom of Belgium), implemented by the UNESCO/IOC Project Office for IODE
- The purpose of the project is to **develop interoperability between existing information systems**, thus improving the flow of information to end users.



OIH Objectives



1

The OIH/ODIS will link a **network of hubs** that will be able to exchange data and information

- Thus contributing to the transfer of marine technology, by enhancing shared scientific and technical capacities to render a wide range of data and information products and services available

2

The OIH will develop a proof-of-concept for an underlying **Ocean Data and Information System (ODIS) architecture** together with partners, in a co-design process.

3

The OIH will develop **regional or thematic end user communities** of practice

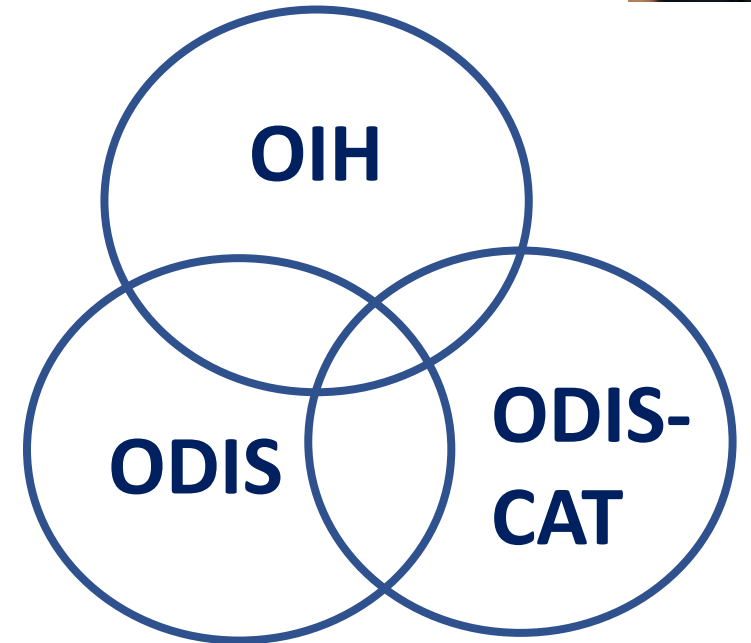
- To promote and foster awareness and collaboration with established organizations and systems providing information, connecting contributors and users with the resources to support their efforts.





Three related initiatives

1. The **Ocean InfoHub Project**
2. **IOC Ocean and Data information system Catalogue of data sources (ODISCAT)**, currently describes over 1000 online sources of marine & coastal data in 16 categories
3. The **Ocean Data and Information System**



OIH links IOC databases

The OIH will first work with **global IOC-associated online resources** – including:



OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

- OceanExpert

OceanExpert
A Directory of Marine and Freshwater Professionals

Event Calendar Projects Search Register

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All ▾ Enter your search text here...

Browse

Experts By:

Last Name

Country

Subject of research

Sea region of research

Institutions By:

Institution name

Country

Sea region of research

Type of Organization

Region	Count
NORTH AMERICA	278
SOUTH AMERICA	1958
EUROPE	3831
AFRICA	1518
ASIA	176
AUSTRALIA	338
INDIAN OCEAN	73
PACIFIC OCEAN	87
ANTARCTICA	261
AFRICA (West)	212
AFRICA (East)	294
ASIA (East)	1510
ASIA (South)	148
ASIA (SE Asia)	1009
ASIA (SE Asia)	24
ASIA (SE Asia)	136
EUROPE (West)	184
EUROPE (East)	538
EUROPE (East)	361
EUROPE (East)	624
EUROPE (East)	1009
EUROPE (East)	136
EUROPE (East)	87



OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

- OceanExpert
- OceanDocs

The screenshot shows the OceanDocs website. The header includes the OceanDocs logo (Repository of Ocean Publications), a language dropdown set to English, and a Login link. Below the header is a navigation bar with a home icon and the text 'OceanDocs Home'. The main content area is divided into several sections:

- Publications in Marine Science in digital form, including preprints, published articles, technical reports, working papers and more.**
- OceanDocs is supported by the Intergovernmental Oceanographic Commission (IOC) to collect, preserve and facilitate discovery and access to all research output from members of the ocean research and observation community and specifically their Ocean Data and Information Networks (ODINS).** It is one of a number of complementary thematic digital marine and aquatic repositories including the Aquatic Commons, which is supported by the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC).
- User Guides**
 - Guidelines for Depositors (English; French; Russian; Spanish)
 - Guidelines for Editors (English; French; Russian; Spanish)
- Communities in OceanDocs**

Select a community to browse its collections.

 - [GEOHAB: Global Ecology and Oceanography of Harmful Algal Blooms](#) [9]
 - [HOSTING: External partners of IOC/ODE: ASCLME; HistMarDocs](#) [11]
 - [ICAN: International Coastal Atlas Network](#) [36]
 - [ICG/IOTWS: Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System](#) [4]
 - [IIOE-2: Second International Indian Ocean Expedition 2015-2020](#) [74]
 - [IOC : Intergovernmental Oceanographic Commission](#) [834]
 - [POGO: Partnership for Global Observation of the Oceans](#) [1]

The right sidebar contains a search bar, a 'BROWSE' section with 'All of OceanDocs' selected, and a 'MY ACCOUNT' section with 'Login' and 'Register' buttons. Below that is a 'DISCOVER' section with 'Author' selected, listing authors like Jamili, Shahla (115), Matinfar, A. (107), Ketabi, Ramin (105), and Pourkazemi, M. (105).



OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

- OceanExpert
- OceanDocs
- the Ocean Best Practices System

ocean best practices About Repository Journal Training Community Engagement Publications Projects News Events Contact

The Ocean Best Practices System (OBPS) [Follow @OceanPractices](#) 395 followers

Consists of:

- Repository/Advanced Technology
- Peer Reviewed Publications
- Training
- User Support
- Good, Better and Best

- a permanent OBPS repository hosted by IODE including state-of-the-art semantic discovery and metadata indexing for improved access to best practices (search.oceanbestpractices.org)
- a peer-reviewed Research Topic Journal in *Frontiers in Marine Science*
- a web-based and in-person Training and Capacity Building capability based on the IODE OceanTeacher Global Academy
- Community outreach and engagement activities to help users integrate OBPS into their routine work.



OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

- OceanExpert
- OceanDocs
- the Ocean Best Practices System
- the Ocean Biodiversity Information System (OBIS)

The screenshot shows the OBIS (Ocean Biodiversity Information System) website. At the top, the logo and name 'OBIS OCEAN BIODIVERSITY INFORMATION SYSTEM' are visible, along with a navigation menu: HOME, ABOUT, DATA, MANUAL, MEDIA, ACTIVITIES, CONTACT. Below the navigation is a large banner image of a sea turtle with the text: 'OBIS is a global open-access data and information clearing-house on marine biodiversity for science, conservation and sustainable development'. Underneath the banner is a search bar with a dropdown menu set to 'Taxa' and a search button. Below the search bar are three statistics: 59,209,926 OCCURRENCES, 3,128 DATASETS, and 131,712 SPECIES. The page is divided into two columns: 'News' and 'Tweets by OBIS'. The 'News' section features a headline: 'OBIS celebrates 20 years and changes name to Ocean Biodiversity Information System' dated May 19, 2020. The text below the headline reads: 'On 26 May 2000, the Census of Marine Life issued a press release to launch the Ocean Biogeographic Information System (OBIS). 20 years later, OBIS continues to grow and innovate under IOC/ODE, both in terms of number of records, in data quality as well as in the variety of data types and technologies. OBIS remains to be place to find accurate information on marine biodiversity. The 20th anniversary also marks the change to a new name, the Ocean Biodiversity Information System.' There is a '20 YEARS OBIS' logo. The 'Tweets by OBIS' section shows a tweet from @OBISNetwork: 'OBIS celebrates 20 years and changes name to Ocean Biodiversity Information System obis.org/2020/05/19/obi...'. There is a speaker icon in the bottom right corner of the slide.

OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

- OceanExpert
- OceanDocs
- the Ocean Best Practices System
- the Ocean Biodiversity Information System (OBIS)
- the World Ocean Database (WOD)

The screenshot shows the NOAA National Centers for Environmental Information website. The header includes the NOAA logo and the text "NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION" and "NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION". Navigation buttons for "Home", "Access Data", "Submit Data", "Public Outreach", and "About" are visible. A search bar is present. A red-bordered box highlights a transition notice: "NCEI is transitioning to a new website and paths to data resources will be changing. Please contact NCEI.Info@noaa.gov with any questions of issues. See the new website at www.ncei.noaa.gov." Below this, the breadcrumb trail reads "You are here: NODC > Ocean Climate Laboratory > OCL Products > WOD". The main content area is titled "WORLD OCEAN DATABASE" and describes it as an NCEI product and an IODE (International Oceanographic Data and Information Exchange) project, funded in partnership with the NOAA OAR Ocean Observing and Monitoring Division. A world map with a color-coded overlay representing oceanographic data is shown. Below the map, text states: "The **World Ocean Database 2018** updates previous versions of the WOD to include approximately 3 million new oceanographic casts added to the WOD and renewed quality control." A note at the bottom indicates: "Note: The official archived format of the World Ocean Database is **netCDF ragged array format** which follows Climate-Forecast conventions. [More information about WOD18.](#)"



OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

- OceanExpert
- OceanDocs
- the Ocean Best Practices System
- the Ocean Biodiversity Information System
- the World Ocean Database (WOD)
- and Ocean Data Portal (ODP)

The screenshot displays the Ocean Data Portal website. The header features the text "OceanDataPortal" and "Seamless access to ocean data" alongside logos for UNESCO, IOC, and IODE. A navigation menu includes links for HOME, OVERVIEW, PARTNERSHIP CENTRE, INFORMATION, OCEAN DATA SYSTEMS, DATA ACCESS, TRAINING, and CONTACTS. The main content area shows a world map with a legend on the left. The legend includes options for "Base layer", "Layers", "Air temperature, C (observation for the last 3 hours)", "Wind speed and direction (observation for the last 3 hours)", "Atmospheric pressure (observation for the last 3 hours)", "PTWC - Indian Ocean Bulletins", "PTWC - Pacific Ocean Bulletins", "USGS Significant Earthquakes, Past Day", and "USGS Significant Earthquakes, Past Month". A footer note reads "Reuse ODP WMS (and other) services at your own location!".



OIH links IOC databases



The OIH will first work with global IOC-associated online resources – including:

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- OceanDocs
- the Ocean Best Practices System
- the Ocean Biodiversity Information System (OBIS)
- the World Ocean Database (WOD)
- and Ocean Data Portal (ODP)
- extended by partnerships with EurOcean, Marinetraining.eu, EMODNET, and other sources in the IOC ODIS Catalogue of Sources (ODIScat).



Initial data types



1. People and institutions/organizations
2. Documents
3. Spatial data/maps
4. Training opportunities
5. Vessels (research opportunities)
6. Projects

ODIS-cat

Bibliographic infobases (catalogues and repositories)	Code lists and vocabularies	Data catalogues	Data products (model output, forecasting, climatologies,...)
Data systems/portals (allowing downloading of datasets)	Education and training materials	Information on platforms (buoys, sensors, floats, gliders, satellites,...)	Information on experts and organizations
Information on projects	Information on vessels	Journals (open source and commercial)	Manuals, guidelines, standards and best practices
Maps and atlases (geospatial products)	Multimedia content	Real-time observing systems	Software (ocean related)



Three pilot regions



1. African region,
2. Latin America and Caribbean region, and the
3. Pacific Small Island Developing States

These three regions have participated in the development of the proposal for the Ocean InfoHub Project and will take a lead on **pilot projects to test interoperability** between existing information hubs.

The three regional nodes will be able to project and receive digital products to and from the OIH infrastructure, while maintaining their native technical implementations that are meeting the needs of their unique user communities (e.g. themes and language).

Capacity for thematic products (e.g. data on the GOOS Essential Ocean Variables; EOVs) will be included at a later stage, and they will be managed by their parent organisation, linked through the ODIS-Architecture.



Existing databases: Global, regional, national and thematic in scope



Ocean Data Portal

Ocean Best Practices

OBIS

Ocean Expert

Ocean Docs

World Ocean Database

Thematic Hub

Global

Regional Hub

Regional Hub

Regional Hub

Thematic Hub

Regional

National Hub

National Hub

National Hub

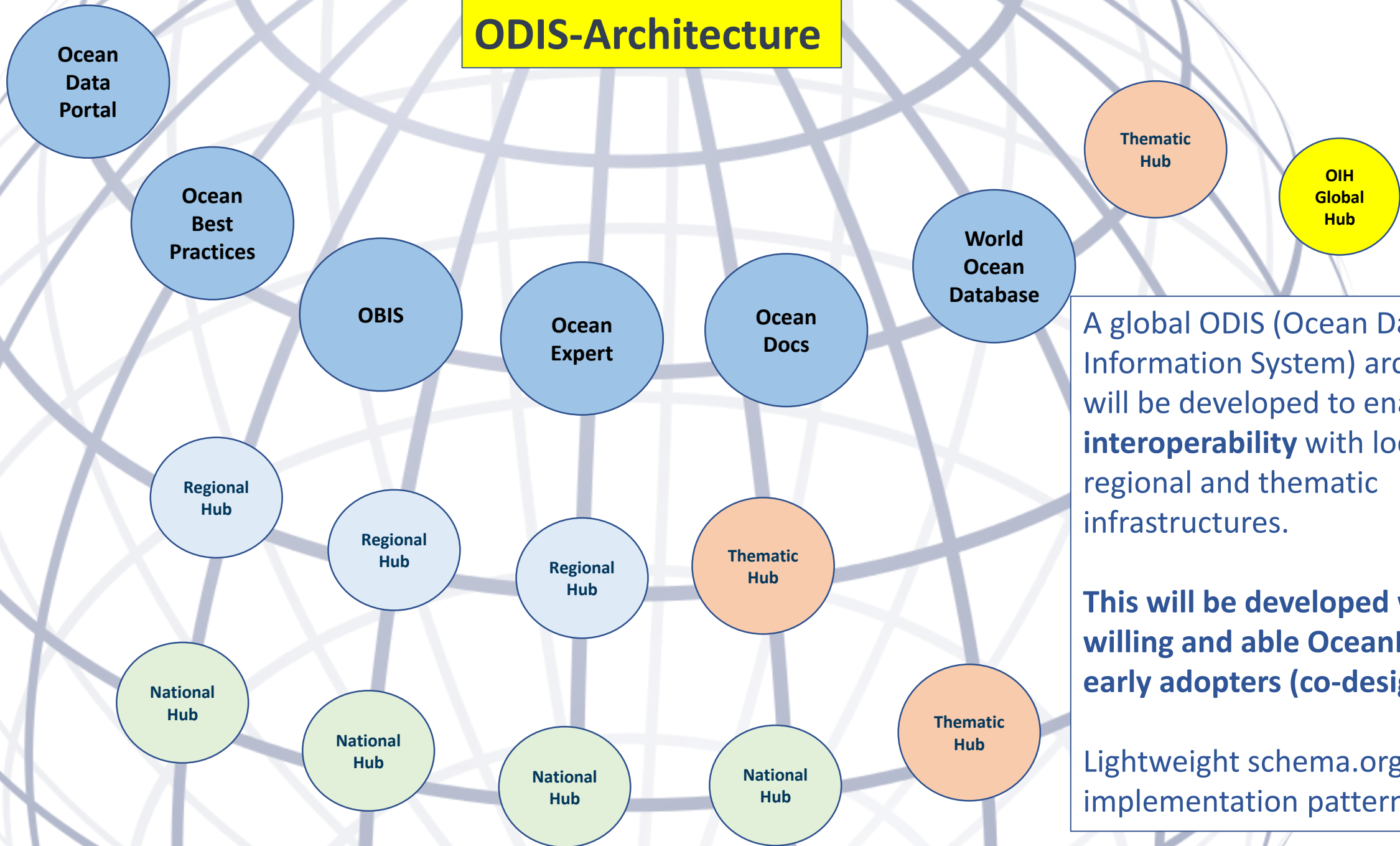
National Hub

Thematic Hub

National



ODIS-Architecture



A global ODIS (Ocean Data and Information System) architecture will be developed to enable **interoperability** with local, regional and thematic infrastructures.

This will be developed with willing and able OceanInfoHub early adopters (co-design)

Lightweight schema.org based implementation patterns 

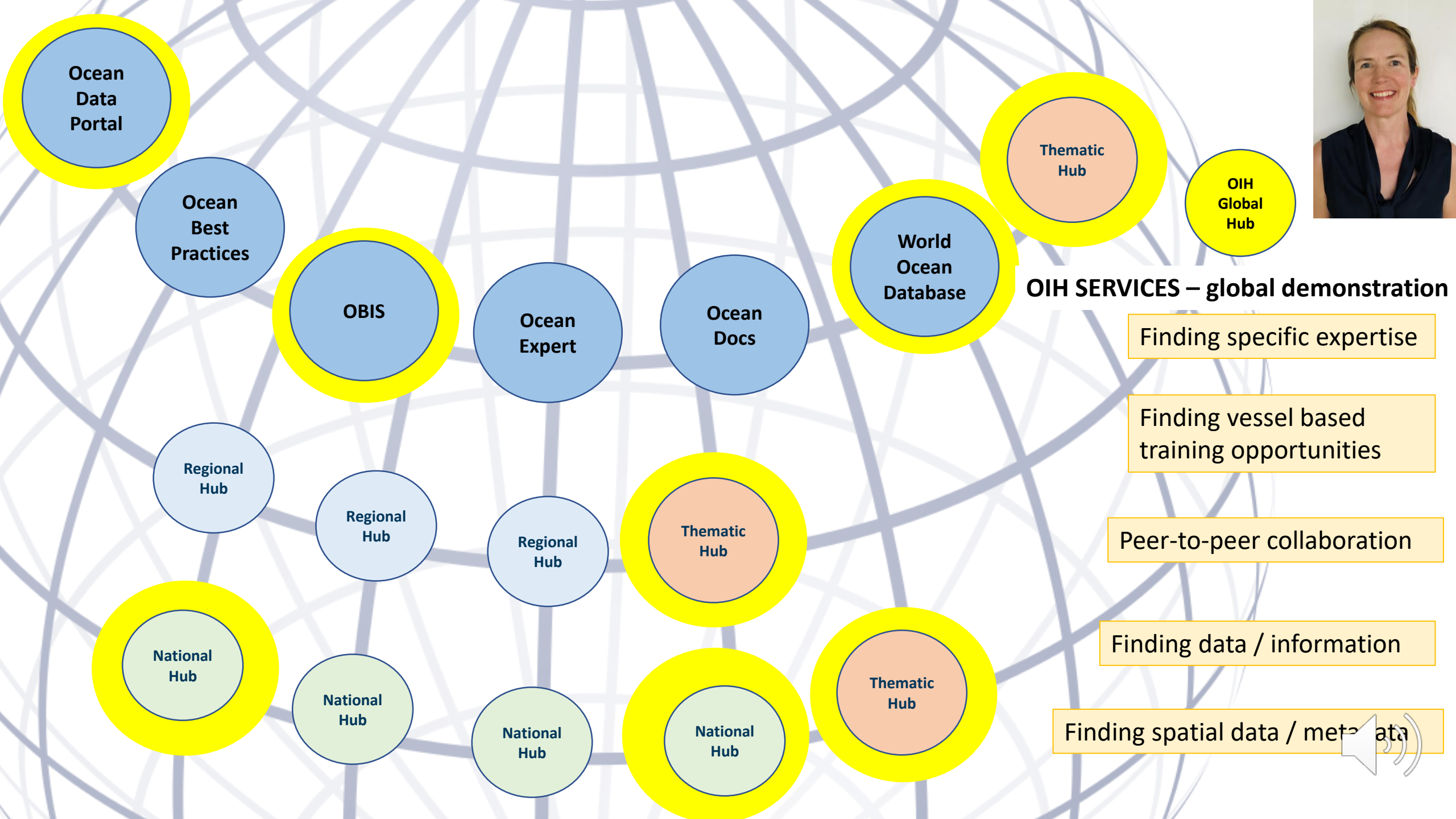
ODIS-architecture



- Each node is in charge of their own contribution
- Linked Open Data and Semantic Web technologies will bridge nodes
- A set of *minimal* interoperability and exchange standards will allow any node to *continuously* cross-talk to any other (ODIS-Arch)
- Anyone can “spin up” solutions like portals & hub(lets) using the interoperability architecture → greater inclusivity

- Nodes**
- will increase partnership through testable interoperation
 - can pull and push resources to other nodes under automatically recognised usage conditions / licenses
 - Co-develop the ODIS-Arch as new needs arise
 - **Multiple entry points and levels of commitment to the ODIS network**





Ocean Data Portal

Ocean Best Practices

OBIS

Ocean Expert

Ocean Docs

World Ocean Database

Thematic Hub

OIH Global Hub

OIH SERVICES – global demonstration

Finding specific expertise

Finding vessel based training opportunities

Peer-to-peer collaboration

Finding data / information

Finding spatial data / metadata

Regional Hub

Regional Hub

Regional Hub

Thematic Hub

National Hub

National Hub

National Hub

National Hub

Thematic Hub



OIH support for the IOC's CD Strategy



These services would all be in support of the IOC Capacity Development strategy.

The project will also focus on the transfer of **local knowledge**,

on supporting **early career scientists**,

and on **remedying gender disparity** by increasing access to information, technologies and opportunities.



OIH support for global reporting



The OIH will assist countries in their reporting requirements for the **Sustainable Development Goals** (particularly goals 4,9, 14 and 17), contribute to key aims of the UN **Decade of Ocean Science** for Sustainable Development, the **Paris Agreement**, the **Sendai Framework** for disaster Risk Reduction and **Marine Biological Diversity of Areas Beyond National Jurisdiction**. The OIH will also assist IOC member states to report on ocean science capacities through the **Global Ocean Science Report (GOSR)**.



In conclusion



- The Ocean InfoHub Project represents a key enabling project, both in the context of advancing UN priorities related to capacity development, but also as an enabler to modernizing data sharing within the global marine data and services communities.
- The OIH will facilitate better access to global databases, but also better visibility of national and regional data holdings.
- The OIH development and implementation principles will be fully based on co-design: the project seeks the participation of a wide range of partners and end user communities that are involved in the sustainable use and management of marine areas.



Thank you

