International Collaboration and Sharing

An Overview of the Ocean InfoHub Project & the International Coastal Atlas Network

Jeff McKenna
OIH technical team

GEO Blue Planet Symposium 2022
Accra, Ghana
2022-10-24

Blue Rocks, Nova Scotia, Canada

OSM node (5750230905)

FOSS4G
THAILAND 2022
KhonKaen ◈ 25th - 27th November

FOSS4G:UK
LOCAL 2022

FOSS4G AKL

October 27, 2022 – Auckland, New Zealand

Reunion of the 3 original founders of the global FOSS4G event (from left to right: Markus Neteler, Jeff McKenna, Venka Raghavan); photo taken at FOSS4G Europe, July 2017, in Paris

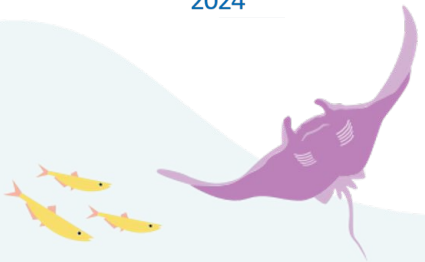
About OIH

GEO Blue Planet Symposium 2022
Accra, Ghana
2022-10-24

The Ocean InfoHub

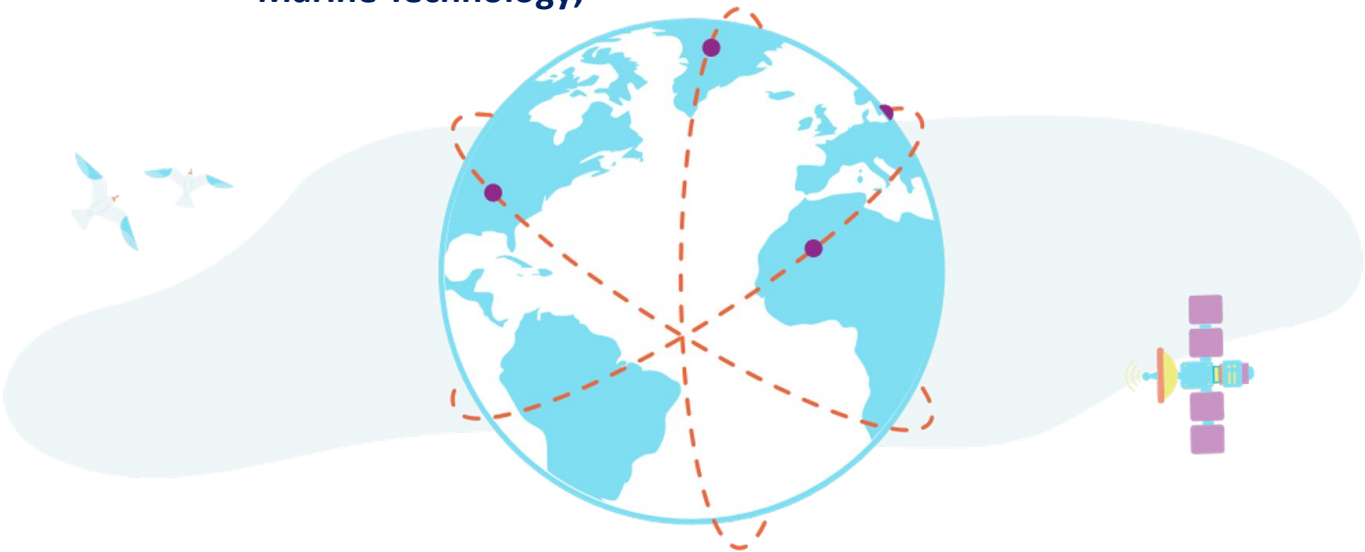
- The Ocean InfoHub (OIH) Project is a global initiative that aims to improve equitable access to ocean information, (meta)data and knowledge products for management and sustainable development.
- Demonstrates the linking of independent partners through the conventions of the Ocean Data and Information System (ODIS).
- Development and implementation principles fully based on **co-design.**

A project of the IOC/UNESCO, implemented by the IODE Project Office for IOC and funded by the Government of Flanders, Kingdom of



From common needs…

- Exponential increase in **Ocean data and digital resources;**
- Need to connect **local, national, and regional digital systems and infrastructures;**
- Need to connect **independent digital initiatives;**
- Need for a **Clearing-House Mechanism for the Transfer of Marine Technology;**



… to shared goals

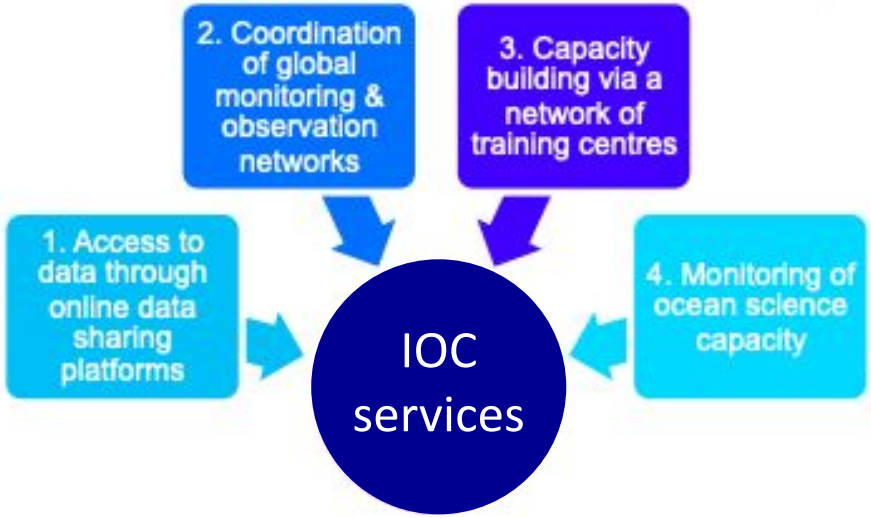
- **Improve discovery and interoperability** of existing information systems;
- **Improve access** to global oceans information, data, and knowledge products for management and sustainable development;
- **Link and anchor a network of regional and thematic nodes** that will aggregate and improve online access to existing global, regional, and national data, information, and knowledge resources;
- **Provide capacity building** to support contributors and end-users of the global OIH;
- **Promote a closer interaction** across regions and themes to support decision making;
- **Connect independent digital initiatives** to form a diverse, but interoperable and inclusive, Ocean Data and Information System.

One of many UNESCO/IOC services supporting access to data and information

Ocean InfoHub

1. Online data sharing platforms:

- International Oceanographic Data and information Exchange (IODE)
- Ocean InfoHub Project (OIH) and Ocean Data and Information System (ODIS)
- Ocean Biodiversity Information System (OBIS)



2. Monitoring and observation networks:

- Global Ocean Observing System (GOOS)
- Harmful Algal Information System (HAIS)
- Global Ocean Acidification Observing Network (GOA-ON) and ocean acidification data portal

3. Capacity development

- Regular Assessment of CD needs
- OceanTeacher Global Academy (OTGA)
- IOC Regional Network of Training and Research Centres

4. Monitoring ocean science capacity

- Global Ocean Science Report (GOSR)

About ICAN

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ICAN is a Community of Practitioners

The aim of the ICAN project is to share experiences and to find common solutions to Coastal Web Atlas development issues, while ensuring maximum relevance and added value for the end users of these portals.

ICAN focuses on user and developer guides, handbooks and articles on best practices, information on standards and web services, expertise and technical support, directories, education, outreach, and funding opportunities.

ICAN history with the AMA:

African Marine Atlas

- ODINAFRICA pre-2014
- African Marine Atlas project
  - ICAN was involved in the SmartAtlas platform development
- Historic Project Metrics
  - 13 countries and 3 Large Marine Ecosystems (LMEs) participated
  - Over 1,000 data records contributed
- Eventually technology moved on and project went dormant
- Over the past few years, several mini-workshops led to a new plan for the flagship ACMA project
- Time for a reboot!

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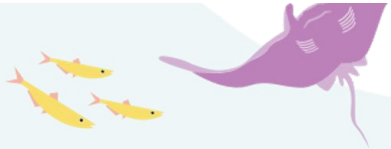
ICAN assistance with the new ACMA:

African Coastal Marine Atlas

- **African Marine Atlas (AMA)**
  - Consisted of 2 separate software packages:
    - 1 for Map & Data visualisation - SmartAtlas/MapServer http://www.africanmarineatlas.org/
    - 1 for Metadata storage and retrieval: AMA Catalogue - GeoNetwork
    - Centralized data collection

- **African Coastal & Marine Atlas (ACMA)**
https://acma.africanmarineatlas.org/
  - Aim is to transition to a single integrated software package
    - GeoNode software integrates both Map/Data visualization and Metadata hosting
    - Includes user accounts for individual control of data contributions
    - Allows both hosted data and “federated” data collections
    - Includes additional features such as the ability to build and host “stories”



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The OIH network

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Three related initiatives

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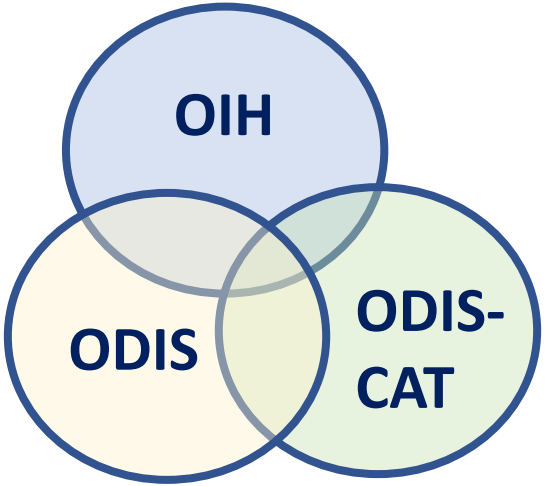

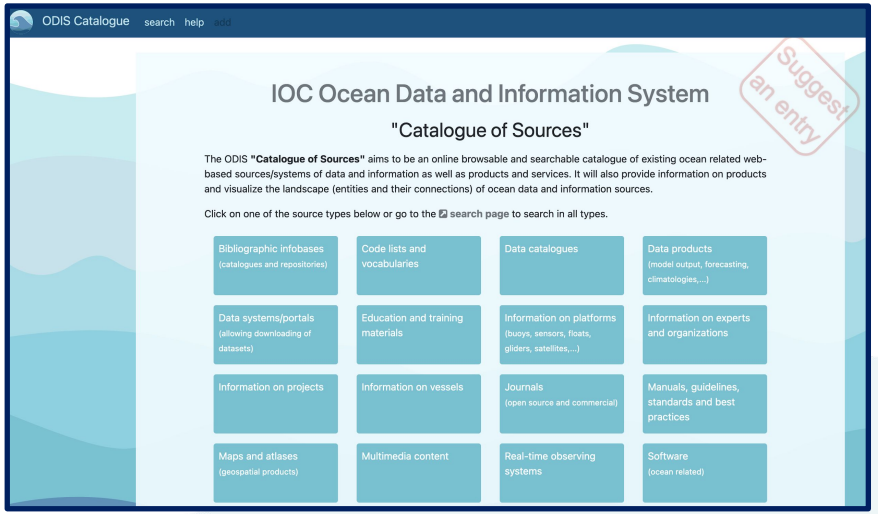

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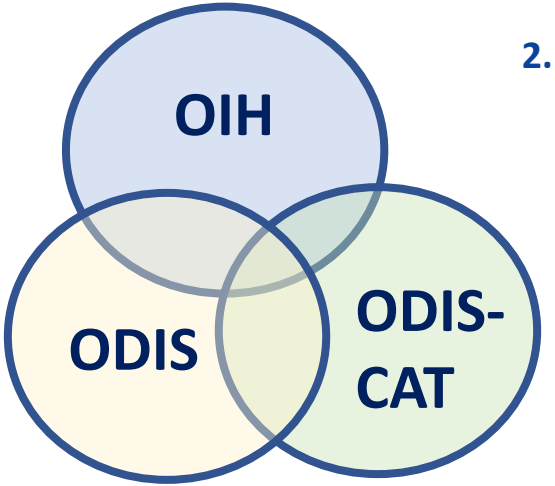

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OIH
Ocean InfoHub

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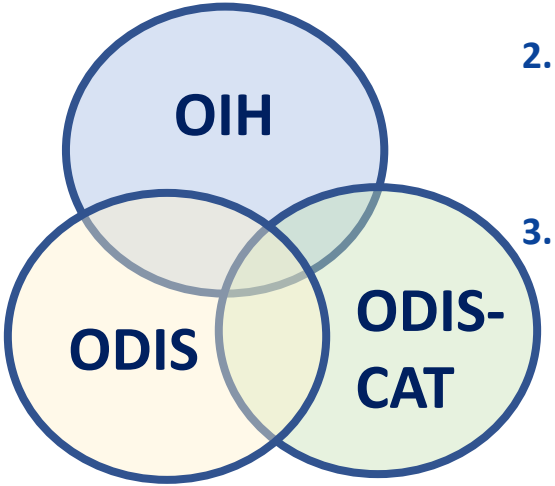

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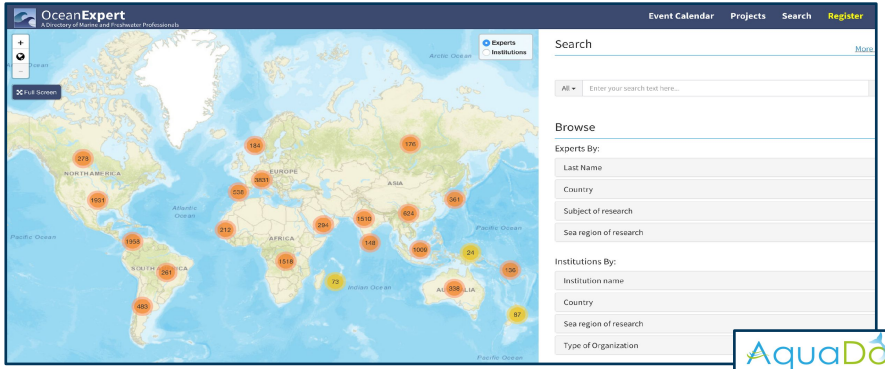
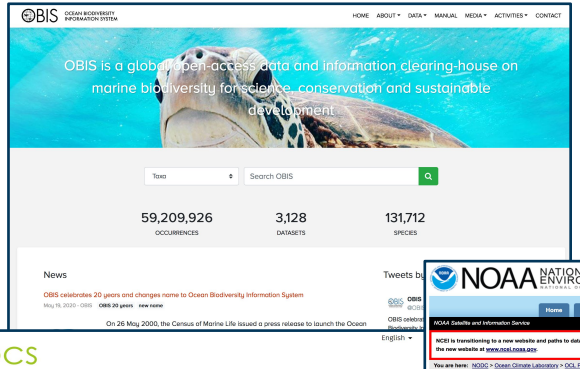
3. **The Ocean InfoHub Project:** The OIH Project has developed the first phase of the architecture underpinning ODIS, and is concerned with involving user communities and establishing proof-of-concept of ODIS.

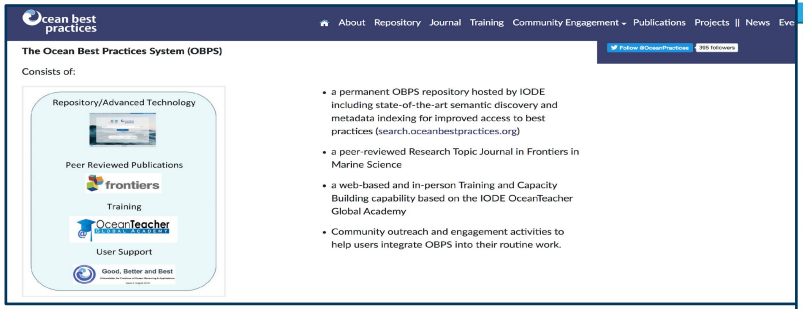
OIH
Ocean InfoHub

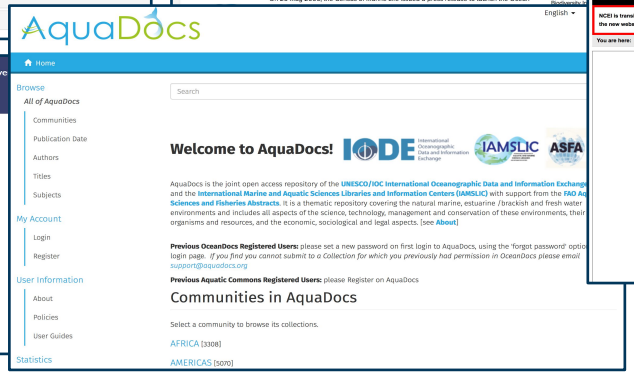
OIH links Global IOC/UNESCO databases

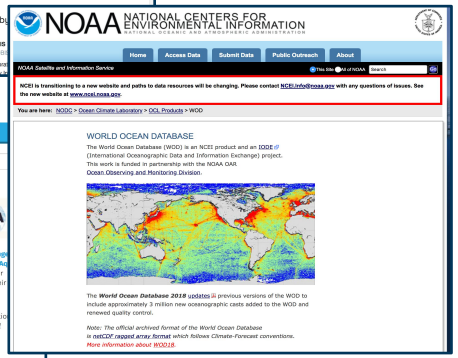
- OceanExpert : *People, institutions and events*
- AquaDocs : *Documents and Publications*
- The GOOS/IODE Ocean Best Practices System (OBPS)
- Data: the Ocean Biodiversity Information System (OBIS)
- [Planned soon] Data: the World Ocean Database (WOD)











Initial profiles (“patterns”)

The initial priorities for the Project (as identified by partners) were to develop specifications to facilitate discovery for six priority themes:

- (i) Experts and institutions/organizations,
- (ii) Documents,
- (iii) Spatial data and maps,
- (iv) Research vessels,
- (v) Education and training opportunities,
- (vi) Projects.

Data categories in 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)

Why Participate?

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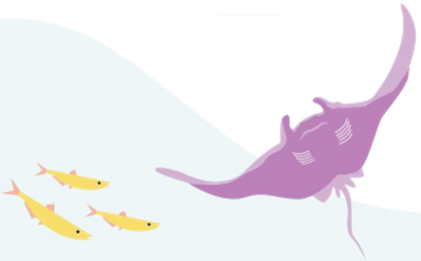
Benefits of Participation

- Contributing to Ocean Decade goals and objectives
- Credit and visibility for local stakeholder efforts:
    - Experts
    - Trainings
    - Data
    - etc
- Access to the contributions of other network contributors (the power of sharing)
- Ability to use contributions automatically in multiple standardized formats



It all starts with data

The OIH digital ecosystem entails:

- Worldwide **data sources;**
- **Patterns** to organise the data, based on **schema.org** properties;
- **The web** as the collective Hub, which is composed of sources of information or **nodes;**
- Minimized **searching time** and maximized output to easily establish **connections.**

The OIH has already achieved….

- Active **technical working groups;**
- Proof-of-concept achieved (it works!) **sharing >500,000 content items**
- Open source **documentation available for the ODIS-Arch;**
- IOC partners and three **regional communities** implementing one or more of the patterns;

OIH
Ocean InfoHub

GMES AND AFRICA
African Union
marco SOUTH
BIOPAMA
CORDIO East Africa
IOCARIBE
SPREP Secretariat of the Pacific Regional Environment Programme
Nairobi Convention
inveмar
ODINAFRICA
Pacific Community Communauté du Pacifique
WIOMSA Coasts Ocean and People

Partners currently indexed and discoverable

The ODIS (Ocean Data and Information System) architecture has been developed, tested and fully documented to enable **interoperability** with local, regional and thematic infrastructures

Indexed in the OIH graph

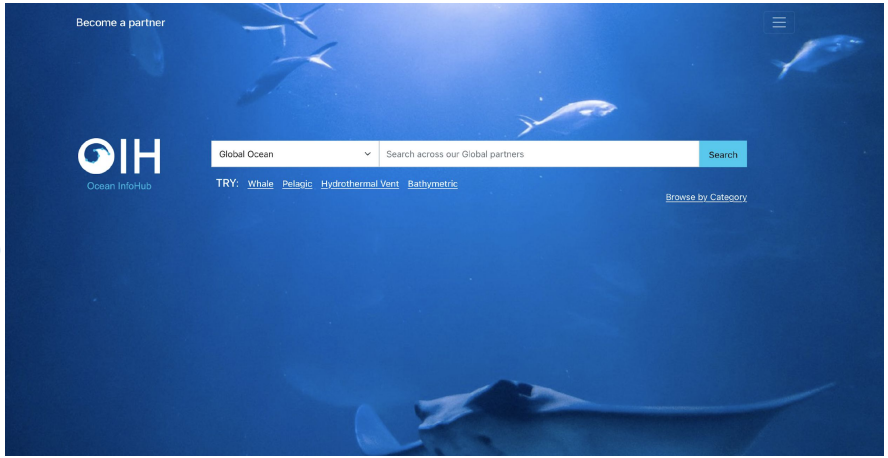
Partners, with development work ongoing

In total, we are working with 47 implementation partners so far (co-design)

International Coastal Atlas Network	El Salvador Ministry of Environment	NOAA / Open-GTS / GOOS Observations Coordination Group	MARISMA Project	Strait of Georgia Data Centre
Marinetraining.eu	Caribbean Marine Atlas	Ocean Best Practices system (OBPS)	University of California San Diego, SCRIPPS	Protected planet
OceanExpert	CORDIO / MASPAWIO	Ocean Biodiversity Information System (OBIS)	Anthropocene Institute	BCC data portal (Benguela Current Convention)
EMODnet	Nairobi Convention (clearinghouse)	Aquadocs	WIO Symphony project	CCLME Eco-viewer
EUROCEAN	MarCoSouth	SARGASSUM Hub	Marine Institute Data Catalogue	OBON (Ocean Biomolecular Observing Network)
INVEMAR	SPC Pacific Data Hub	CLME+ training portal	Tsunami programme	IUCN (International Union for Conservation of Nature)
Argentina, NODC	SPREP Pacific Environment Portal	SeaDatanet	Indonesian NODC	Canadian Integrated Ocean Observing System
Colombia DIMAR NODC	Blue Planet / BIOPAMA (RCMRD)	POGO / OceanScape	POLDER	ODINAFRICA (Ocean Data and Information Network for Africa)
Colombia National Natural Parks	UNEP (UN Environment Programme)	VLIZ Flanders Marine Institute	OpenOceanCloud	METS RCN - Marine Ecological Time Series RCN

The Hub

- **Sustainable, interoperable, inclusive,** and **openly accessible;**
- Composed of **nodes**, through which data providers and partners can communicate, discover and share data, and connect;
- Does not depend on a central Hub, the **web** is our **collective Hub;**
- **Partners choose** which metadata they would like to share.
- Anyone can develop thematic or regional portals.
- We have a Global Search Hub as a demonstrator of the system



Search, discover, and connect

- **Search** through InfoHub platform **AND** other search engines
- **Discover** and **share** data
- **Connect** with marine and coastal Ocean data centres across the globe

Contribution and impacts

- Support **IOC capacity development** strategy;
- Address **knowledge needs** of national and regional requirements;
- Enhance **discovery** and improve **access** to ocean data and information, services, and products;
- Provide **global access** independently of development stage or contributions;
- Strengthen **science, technology, innovation systems,** and **policies** for the global ocean community;
- Improve **management** and **decision-making** for the sustainability of Ocean ecosystems.

Contribution and impacts

Ocean InfoHub

A dynamic and inclusive Ocean information system open to all

Support **early career** scientists

Transfer of **local knowledge**

Remedy **gender disparity**

Impacts on international frameworks

The Ocean InfoHub is leading OceanData-2030, a registered Programme of the UN Decade for Ocean Science for Sustainable Development

Ocean InfoHub

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

Global Ocean Science Report 2020
Charting Capacity for Ocean Sustainability

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

SUSTAINABLE DEVELOPMENT GOALS
4 QUALITY EDUCATION
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
14 LIFE BELOW WATER
17 PARTNERSHIPS FOR THE GOALS

SENDAI FRAMEWORK
FOR DISASTER RISK REDUCTION 2015-2030

BBNJ
Biodiversity Beyond National Jurisdiction

Supports FAIR principles

Ocean InfoHub

1. **Findable** (Metadata and data should be easy to find. For example through the use of globally unique and persistent identifiers, described with rich metadata, and indexed in a searchable resource)
2. **Accessible** (Retrievable by their identifier using a standardized communications protocol)
3. **Interoperable** (enabling integration with other data – applications or workflows, vocabularies that follow FAIR principles)
4. **Reusable** (the ultimate goal of FAIR is to enable the reuse of data. Well documented and described).

Further reading https://www.go-fair.org/fair-principles/

Benefits

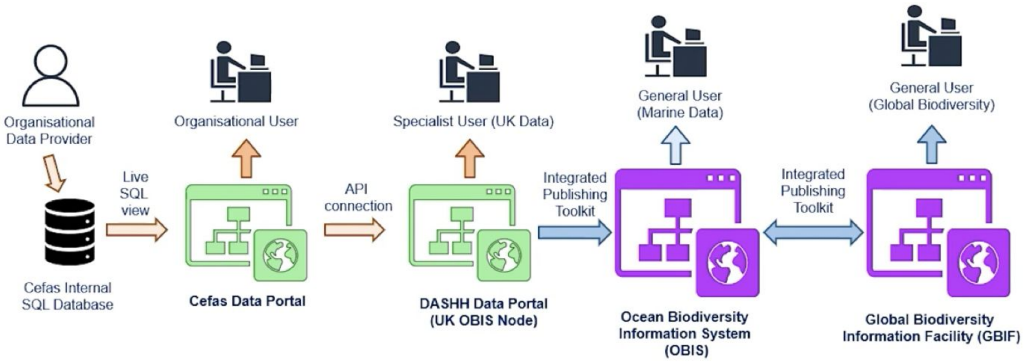
- **Easy to use;**
- **Based on existing standards;**
- **Interoperability** with local, regional, and thematic structures;
- **Automated and scalable communication** between the many marine data and information systems

Ocean InfoHub

Benefits to:

- **Data providers**

 Share (meta) data only once. Retain ownership and control. Change visibility of your data as you choose. Increase visibility of your data and information to the world.



Laura Hanley, Oliver Williams and Natasha Taylor

Portal proliferation or strengthening the ocean data network

Presented at the International Ocean Data Conference, Sopot, Poland, 14-16 Feb 2022

https://youtu.be/h25VE9_toBU

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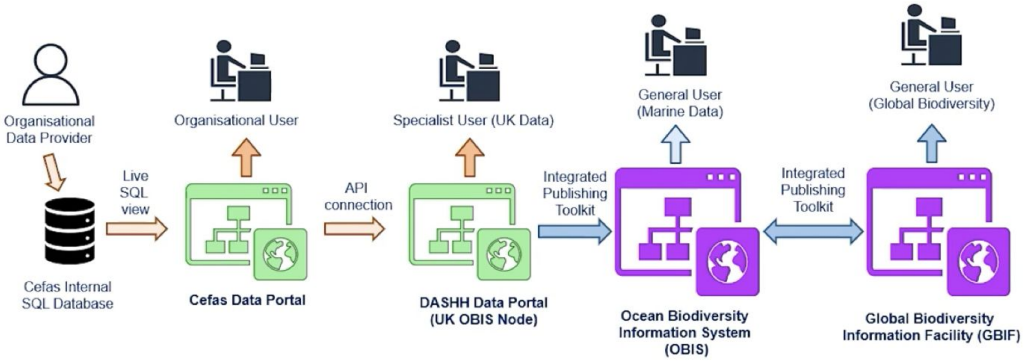
 Access the same data set through the portal or resource best suited to you.



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- **Existing global portals eg OBIS**

- Access the ODIS knowledge graph and >500,000 content items from partners. Re-share those of regional or thematic interest to your portal. Every record always links to the original source.
- One can be a contributor as well as a user

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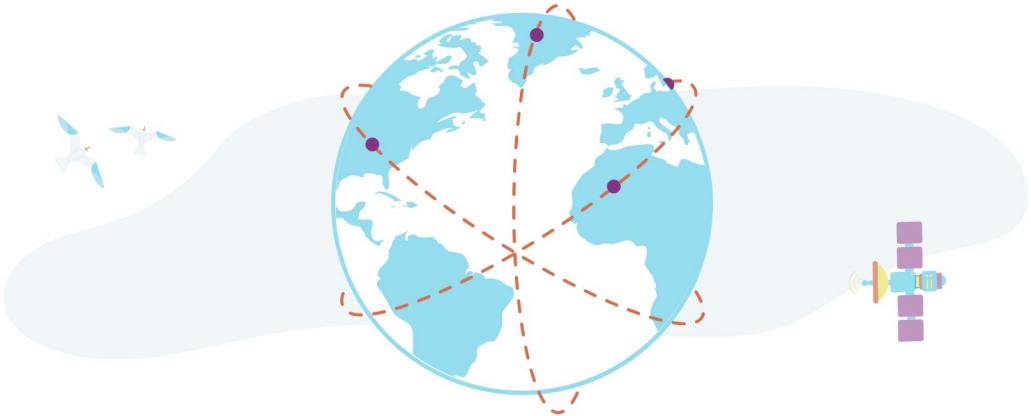
- **Existing regional portals eg SPREP**

- Regional Seas organisation serves the needs of member states in the Pacific.
- SPREP links to the Ocean InfoHub to increase access to global data useful to member states and for State of the Environment Reporting.
- SPREP facilitates member states / institutions to share their metadata for global discovery.

The Ocean InfoHub Project is helping to address:

- Challenges related to trust that may hamper data sharing
- Challenges related to differing capacity across regions and institutions
- Awareness of projects and opportunities within regions, and globally
- Awareness of the existence of digital resources (from local to global scale)
- Improved access to global information resources



Focus on Africa

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Pilot regions

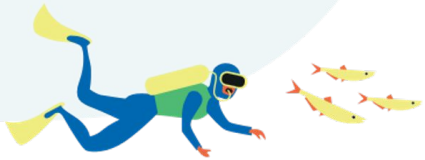
Three regions have participated in designing the project and are taking a lead on **pilot projects to test interoperability** between existing information hubs.

Ocean InfoHub

Latin America
and the Caribbean

Africa

Pacific Small Island
Developing States



Pilot Region: Africa

- Support for National Oceanographic Data Centres and ADUs to become partners
- Partners included in the technical working group for development of the ODIS-architecture.
- Together with the University of Ghent and OTGA, developed an online database for discovering marine training opportunities.
- Online training course (free, can be taken any time)
- Supporting the revitalization of ODINAFRICA and the African Marine and Coastal Atlas

CORDIO East Africa

BIOPAMA

WIOMSA Coasts Ocean and People

ODINAFRICA

GMES AND AFRICA

African Union

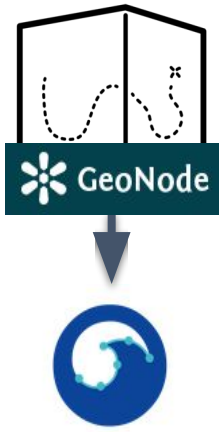
marco SOUTH

How are OIH and ICAN working together in Africa?

- Interacting with project leaders to figure out how to connect local data holders with the global networks
  - Coordinating with ODINAFRICA
  - Setting up / supporting ACMA
  - Long Term community building for data sharing

Connecting ACMA to OIH

- 1000+ records from old AMA can be imported into ACMA GeoNode
- Newer records can be added to augment, and federated catalogs can also be linked
- Records visible in GeoNode will then be available via a CSW endpoint
- Records can be translated to JSON-LD via existing Python script, leveraged by other OIH partners, made visible through ODIS



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Next Steps for ODINAFRICA members

- Build a community around the flagship ACMA platform!
- Recruit representatives from each NODC & other contributing institutions
- Organize trainings for contributing partners on GeoNode accounts
- Migrate older AMA records into ACMA, and review
- Plan for priority data contributions into the future
- Plan to build and showcase stories around priority topics for end users
- Determine what other projects should be federated into the ACMA

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Long Term ACMA Project Stewardship

- Form an active Project Steering Committee (PSC)
- User Group Meetings, in-person, and online
- Cultivate community via training
- Share how users are employing the platform
- Listserv for communication
- Set up an ODINAFRICA organization on GitHub
- Long Term Funding
- Funding for maintenance
- Funding for JSON-LD support directly into GeoNode
- Long-term plan for Upgrade existing GeoNode instance
- Determine long-term stewardship plan for the project going forward

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How to get involved

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How to get involved in ICAN community

- To become involved in the ICAN project, email a co-chair:

Kathrin Kopke
k.kopke@ucc.ie

Tanya Haddad
tanya.haddad@dlcd.oregon.gov

- Join our Email Listserv:
http://mail.iode.org/sympa/subscribe/ican_updates

ICAN | IODE

How to get involved in OIH community

- To become involved in the OIH project, email Jeff: jp.mckenna@unesco.org
- Join us on Slack:
  - https://join.slack.com/t/oceaninfohub/shared_invite/zt-1in36osmo-O0ov8u3ijIQNDk9Sh46vDA