The Ocean InfoHub Project and the Ocean Data and Information System: Developing a Digital Ocean Ecosystem

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The United Nations Educational, Scientific and Cultural Organization's Intergovernmental Oceanographic Commission (UNESCO/IOC) Project Office for International Oceanographic Data and Information Exchange (IODE) has documented over 3100 online repositories of ocean data and information, which shows the highly complex online environment, and challenge of finding the right information from the right source (ODISCat 2023-10; https://catalogue.odis.org).

The Ocean InfoHub Project was designed to address this challenge through the development of the Ocean Data and Information System (ODIS). ODIS is not a new portal or centralised system under the control of a single authority, but a partnership of distributed, independent systems voluntarily sharing (meta)data and information along co-developed and clear conventions in the pursuit of common goals. These conventions are formalised and operationalised in the ODIS Architecture (ODIS-Arch) to allow existing and emerging ocean data and information systems, from any stakeholder, to interoperate with one another. This enables and accelerates more effective development and dissemination of digital technology and sharing of ocean data, information, and knowledge for sustainable development.

The Ocean InfoHub Project now supports a global network of distributed information and data resources related to the ocean. The Project has had a focus on co-design with three pilot regions in particular: Africa, Latin America and the Caribbean (LAC), and the Pacific Small Island Developing States (PSIDs), to meet their unique user community requirements. The three regional nodes facilitate that local, national, and regional digital systems and infrastructures could be interlinked to strengthen science, technology, innovation systems, and policies for the sustainable use and management of marine areas.

The Ocean Data and Information System (ODIS) Architecture links over 32 nodes from 25 partners. This is demonstrated through three regional portals and a global search portal that can now be searched to find Oceans related data and information from multiple sources (https://oceaninfohub.org). The global portal, is an openly accessible online platform and it currently contains over 130,000 content items in 8 content categories: (i) Experts (27,000); (ii) Institutions (13,000); (iii) Documents (42,000); (iv) Training (1,500); (v) Vessels (113); (vi) Projects (3,600); (vii) Datasets (48,000); and (viii) Spatial search (42,000).

The IOC Assembly at its 31st Session (2021) formally established ODIS through Decision A-31/3.4.2., ensuring its long term support as a stand-alone project. Subsequently, IODE-XXVII decided to designate ODIS as one of three IODE Programme Components, which further strengthens its long term support.

Besides its core pilot areas and themes, OIH/ODIS is now supporting additional communities of practice such as those focused on Marine Protected Areas, the GOOS (Global Ocean Observing System) Essential Ocean Variables (EOV) and Areas Beyond National Jurisdiction (ABNJ). Interoperability and strategic alignment deliberations are underway with organisations including the Group on Earth Observations Biodiversity Observation Network (GEO BON), the

Helmholtz Metadata Collaboration (HMC), the Earth Science Information Partners (ESIP), and the Polar Data Discovery Enhancement Research (POLDER) project).

The ocean digital ecosystem concept promoted through OIH/ODIS has also been adopted by the UN Decade of Ocean Science for Sustainable Development and is referred to in the Data & Information Strategy for the UN Ocean Decade. It will furthermore be promoted by the Decade Coordination Office (DCO) for Data Sharing, that was approved for establishment by the IOC Executive Council (2022) and is hosted by the IOC Project Office for IODE, Oostende, Belgium. A Programme called An Ocean Data and Information System supporting the UN Decade of Ocean Science for Sustainable Development (OceanData-2030) has been registered with the UN Decade for Ocean Science for Sustainable Development. Together, ODIS and OD-2030 will contribute to Outcome (6), "An accessible ocean" and Decade challenges 8-10, by provisioning a common digital infrastructure to support discoverability and exchange of data, information and knowledge. Challenge 9 is a particular focus, as ODIS aims to lower the barriers to accessing information and thus improve equitable access.

The overarching goal of the Ocean Data and Information System (ODIS) in the long term, is to provide a sustainable and responsive digital ecosystem where users can discover data, data products, data services, information, information products and services provided by IOC Member States, independent projects, private sector partners, and other partners associated with the UN Decade of Ocean Science for Sustainable Development.