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**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**

(of UNESCO)

**Twenty-sixth Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE-XXVI)**

**online, 20-23 April 2021**

**Proposal for the Establishment of the IOC Ocean Data and Information System (ODIS)**



# BACKGROUND

The IOC Assembly, at its 29th Session (June 2017) expressed its support for the proposed development of an Ocean Data and Information System (ODIS) concept paper and stressed that ODIS should focus on leveraging existing efforts. The concept paper states “*The IOC Ocean Data and Information System (ODIS) will be an e-environment where users can discover coastal and ocean data, information and associated products or services provided by IOC Member States, projects and other partners of IOC. The system will aim to align itself with accepted community data management principles, such as the FAIR (Findable, Accessible, Interoperable and Reusable) principles (Wilkinson et al[[1]](#footnote-1).) and, where feasible, interoperate with existing data solutions*”.

The IOC Assembly at its 30th Session, through Decision IOC-XXX/7.2.2 (Ocean Data and Information System (ODIS)):

“Endorses the ODIS Concept, Implementation Plan and Cost Benefit Analysis;

Invites the IODE Committee to prepare a fully detailed and costed project proposal for the IOC Ocean Data and Information System (ODIS) for submission to the IOC Executive Council at its 53rd session in 2020.”

This Document provides the “**fully detailed and costed project proposal for the IOC Ocean Data and Information System (ODIS)**”. While this document should have been submitted to EC-53 in 2020, this was not possible due to the Covid19 pandemic. Consequently, the document shall be submitted to the thirty-first Session of the IOC Assembly in June 2021.

# PROGRESS TIMELINE 2017-2021

* **2017**: In preparation for the 24th Session of the IODE Committee (March 2017) Document [IOC/IODE-XXIV/6.2.1](https://www.iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=18703) was prepared.
* **March 2017**: The 24th Session of the IODE Committee (March 2017) adopted Decision IODE-XXIV.4 (Ocean Data and Information System) which decided: “*(i) that IODE will work with existing stakeholders, linked and not linked to the IOC, to improve the accessibility and interoperability of existing data and information, and to contribute to the development of a global ocean data and information system, to be referred to as the IOC Ocean Data and Information System, leveraging established solutions where possible; and (ii) to establish an inter-sessional working group to finalize the concept paper for the Ocean Data and Information System*”.
* **June 2017**: The 29the Session of the IOC Assembly (2017) adopted the following text as part of Decision IOC-XXIX/6.2.1 on IODE: “*Instructs the IODE inter-sessional working group to further develop the concept paper for the IOC Ocean Data and Information System, taking into account, inter alia, the results and functioning of the IODE Ocean Data Portal as well as comments and suggestions received from Member States, and submit the final document to the Assembly at its 30th session in 2019 together with a draft implementation plan, supported by a cost-benefit analysis as feasible*.”
* **July 2017- January 2019**: In preparation for the 25th Session of the IODE Committee (February 2019) [Document IOC/IODE-XXV/5.2](https://iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=23386) was prepared (IOC Ocean Data and Information System - Concept Paper and Summary Implementation Plan 2019-2020). This document reported on the work of the inter-sessional working group which included the revision of the ODIS concept (reflected in the vision statement above), a proposal for a phased approach, a proposal for the development of an ODIS Catalogue of Sources (with implementation plan for 2019-2020), and initial considerations for an ODIS metadata catalogue and ODIS “portal”. In addition the document described a few use cases.
* **December 2018:** [ODISCat](https://catalogue.odis.org/) prototype launched. The prototype employs a model based on a review of schema.org by the former IODE Expert Team on Data Management Practices (ETDMP), and was intended to foster discussion and planning towards the broader ODIS concept. [ODISCat](https://catalogue.odis.org/) continues to prove useful as a planning tool, identifying stakeholders and resources deemed useful by the contributors.
* **February 2019**: The 25th Session of the IODE Committee (February 2019) approved the concept paper ([Document IOC/IODE-XXV/5.2](https://www.iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=23386)). In addition IODE-XXV adopted (i) Recommendation IODE-XXV/5.2.1 (Establishment of the IOC Ocean Data and Information System Catalogue of Sources ([ODISCat](https://catalogue.odis.org/)) project); and (ii) Decision IODE-XXV/5.2.3 \*Establishment of the Inter-sessional working group to develop the implementation plan and cost-benefit analysis for the IOC Ocean Data and Information System). The latter was instructed to
  1. Prepare the draft implementation plan and related cost-benefit analysis of the Ocean Data and Information System, detailing the proposed services that will be offered by ODIS, using the list included in agenda item 5.2.2 of Document IOC/IODE-XXV/2;
  2. Prepare a work plan including an initial set of services that will be developed during 2019-2021;
  3. Submit (i) and (ii) above to the 30th Session of the IOC Assembly, for its consideration.
* **2019**: in preparation for the 30th Session of the IOC Assembly (June/July 2019), the above mentioned intersessional working group prepared Document [IOC-XXX/2 Annex 6](http://legacy.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=24645) (IOC Ocean Data and Information System (ODIS): Concept, implementation plan and cost benefit analysis). The document offered 4 implementation options:
  1. Option 1: List of Links
  2. Option 2: Repository of Sources ([ODISCat](https://catalogue.odis.org/))
  3. Option 3: Central Data Portal
  4. Option 4: Stepwise development of ODIS leveraging existing infrastructure (ODISstep)

For each option budget estimates were prepared for 2020-2021. The four options were compared in terms of benefits and weaknesses. 21. This preliminary Cost Benefit Analysis shows that Option 4 (Stepwise development of ODIS leveraging existing infrastructures (ODISstep)) will provide the maximum of benefits at a medium size cost.   
The Document proposed to use Option 4: Stepwise development of ODIS leveraging existing infrastructures (ODISstep) starting with a Catalogue of Sources: (structured and searchable) repository of sources (catalogue of URLs), followed by metadata catalogues and ending with a central data/information repository, or a harmonized view of multiple data/information repositories. It further recommended 16 content types for [ODISCat](https://catalogue.odis.org/).

* **June 2019:** [CHM/TMT “portal” prototype](http://portete.invemar.org.co/chm) developed and presented by INVEMAR (Colombia), including presentation prior to IOC-XXX, as precursor to ODIS/OIH.(see <http://portete.invemar.org.co/chm>)
* **June 2019**: the 30th Session of the IOC Assembly (June/July 2019) “*stressed the need to develop ODIS with involvement from the widest possible range of stakeholders, ensuring active participation from IOC Member States but also from other UN agencies, NGOs, national and regional programmes and projects, as well as the private sector. The Assembly noted that the IOC ODIS would form a solid and scalable basis for a UN Decade data system*”. The Assembly adopted Decision IOC-XXX/7.2.2 (IOC Ocean Data and Information System (ODIS) which states:

“*Endorses the ODIS Concept, Implementation Plan and Cost Benefit Analysis;*

*Invites the IODE Committee to prepare a fully detailed and costed project proposal for the IOC Ocean Data and Information System (ODIS) for submission to the IOC Executive Council at its 53rd session in 2020* “

It is noted that the 53rd Session of the IOC Executive Council could not be held in 2020 and accordingly this matter will be considered by the 31st Session of the IOC Assembly which will be held online in June 2021.

* **July-September 2019:** development of the project proposal “IOC Ocean InfoHub” and submission to the UNESCO/Flanders Funds-in-Trust for the Support of UNESCO’s activities in the Field of Science (FUST)
* **April 2020:** start of the [Ocean InfoHub project](https://oceaninfohub.org). The Ocean InfoHub (OIH) Project aims to improve access to global oceans information, data and knowledge products for management and sustainable development. The OIH will link and anchor a network of regional and thematic nodes that will improve online access to and synthesis of existing global, regional and national data, information and knowledge resources, including existing clearinghouse mechanisms. The OIH Project aims to develop the first proof-of-concepts of the Ocean Data and Information System (ODIS). The OIH Project is a three-year project funded by the Government of Flanders, Kingdom of Belgium, and implemented by the IODE Project Office of the IOC/UNESCO. (<https://oceaninfohub.org>)
* **August 2020:** recruitment consultant (August 2020 - December 2020, extended to June 2021) to “support and monitor the implementation of the [ODISCat](https://catalogue.odis.org) project, and in particular manage and administer, on a daily basis the ODISCat catalogue”.
* **January 2021**: The 2021 Meeting of the IODE Management Group (Pre-Committee meeting) held 12-14 January 2021 welcomed the approval of the [Ocean InfoHub](https://oceaninfohub.org) project and the start of the project in April 2020. The Management Group noted that many of the 150 Member States currently do not have the required human and technical capacity to host online data and information services even when an NODC or ADU is present. As the stakeholder focus of [OIH](https://oceaninfohub.org) goes beyond the “traditional” IODE community it is fair to assume that the number of potential data and information sources that cannot host their own online services will be substantially higher than those we are aware of today. As such we risk missing out on a huge amount of “hidden” data and information available from potential stakeholders. It looks obvious that the efforts of Partnership Center for IODE Ocean Data Portal should be concentrated now on OIH/ODIS rather than standalone tools only as it was before. The Management Group welcomed the proposal to establish the Partnership Centre for ODIS ([Document IOC/IODE-MG-2021/2.2](https://iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=27613) (Concept Note – IODE Partnership Centre for ODIS) ) and requested Dr Belov to prepare a working document for IODE-XXVI including background, objectives, expected results and deliverables, work plan and budget as well as a draft Recommendation for consideration by IODE-XXVI.
* **February 2021**: drafting of this document

# THE ODIS VISION

The overarching vision for ODIS has evolved since its inception in 2017 and is currently summarized as follows:

*The IOC Ocean Data and Information System (ODIS) will be an e-environment where users can discover data, data products, data services, information, information products and services provided by Member States, projects and other partners associated with IOC(\*).*

(\*) while ODIS will initially focus on "partners associated with IOC" this can be expanded, taking into account the partnership established under the UN Decade of Ocean Science for Sustainable Development"

# CORE COMPONENTS of the ODIS DIGITAL ECOSYSTEM

ODIS will be an open-ended system of systems, where components interoperate through ODIS-Arch (see 4.1). However, the components of the ODIS ecosystem discussed in 4.2 - 4.4, will provide anchor points for the community. These either have been established or are in active development.

## ODIS “digital ecosystem”

ODIS will interlink distributed, independent, systems (within and outside of the IOC) through a decentralized interoperability architecture (ODIS-Arch), to form a digital ecosystem. As with natural ecosystems, ODIS will be resilient to the gain or loss of parts, and accommodate high diversity of products and services, while maintaining its core functions. In this way, ODIS will provide a comprehensive and global “*e-environment where users can discover data, data products, data services, information, information products and services provided by Member States, projects and other partners associated with IOC.”.* The ecosystem diagram is shown in Figure 1.

The initial implementation of ODIS-Arch - upon which the digital ecosystem will rely - will be supported through the [Ocean InfoHub (OIH)](https://oceaninfohub.org) Project (see 4.3) and will provide an interoperability layer and supporting technology to allow existing and emerging ocean data and information systems, from any stakeholder, to interoperate with one another. This will enable and accelerate more effective development and dissemination of digital technology and sharing of ocean data, information, and knowledge. As such, ODIS will not be a new portal or centralised system but will provide a collaborative solution to interlink distributed systems for common goals.

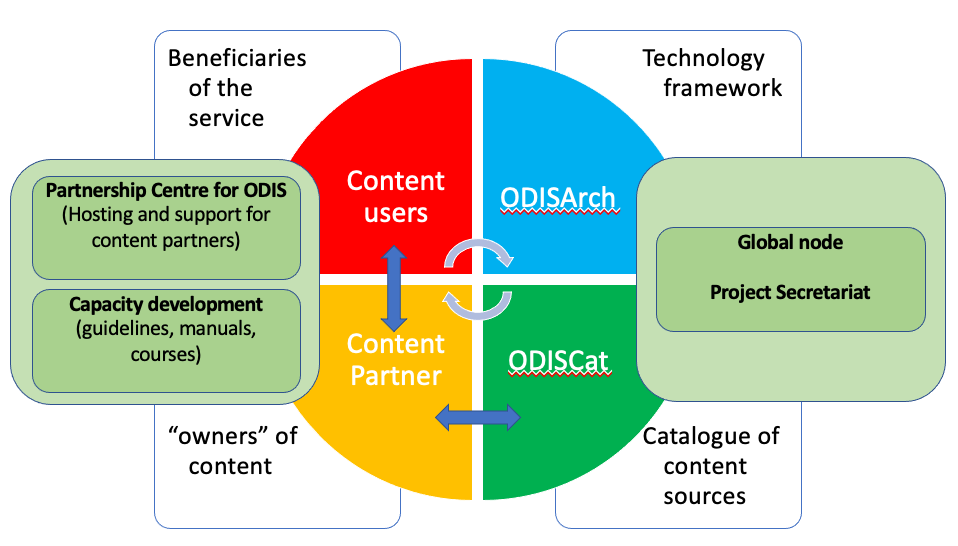


Figure 1: the ODIS digital ecosystem

## 4.2 ODISCat

<https://catalogue.odis.org/>

The ODIS "Catalogue of Sources" is the initial demonstration of an online, browsable and searchable catalogue of existing ocean related web-based sources/systems of data and information, products, and services. Services such as ODISCat will provide an index and backbone for technologies navigating the ODIS ecosystem. ODISCat serves as a base source of information for planning regional and thematic nodes while acting as a discovery tool for users.

* The ODISCat interface is structured around the 16 core resource types deemed to be most relevant to the IODE community (data, products, portals, training, …)
* ODISCat employs a common core metadata profile, demonstrating the feasibility/value of using lightweight profiles to enable discovery of heterogeneous resources from a common catalogue
* Engagement with IODE members and partners has served to identify stakeholders for follow-up activity
* ODISCat has itself improved discoverability of registered resources

As the broader ODIS ecosystem develops, ODISCat will begin to use more intelligent and standardised mechanisms to extend and update its holdings.

## 4.3 Ocean InfoHub (OIH)

<https://oceaninfohub.org/>

The Ocean InfoHub (OIH) Project aims to improve access to global ocean information, data and digitised knowledge products for management and sustainable development. Leveraging ODIS-Arch and the contributions from partners in ODIS (see 4.1), the OIH will link and anchor a network of regional and thematic nodes that will improve online access to and synthesis of existing global, regional and national data, information and knowledge resources, including existing clearinghouse mechanisms. The project will not establish a new centralized database but will support discovery and interoperability of existing information systems over the Web. The OIH Project is a three-year project (2020-2023) funded by the [Government of](https://www.vlaanderen.be/) [Flanders](https://www.ewi-vlaanderen.be/en), Kingdom of Belgium, and implemented by the [IODE Project Office](https://iode.org/) of the [IOC/UNESCO](https://ioc.unesco.org/index.php?Itemid=100124&id=392&option=com_content&view=article).

The OIH will first work with IOC-associated online resources – including [OceanExpert](https://oceanexpert.org/), [OceanDocs](https://www.oceandocs.org/)/[Aquadocs](http://aquadocs.org), the [Ocean Best Practices System](https://www.oceanbestpractices.org/) (OBPS), the [Ocean Biodiversity Information System](https://obis.org/) (OBIS), [the World Ocean Database](http://wod.iode.org/SELECT/dbsearch/dbsearch.html) (WOD) and [Ocean Data Portal](http://www.oceandataportal.org/) (ODP) – extended by partnerships with [EurOcean](https://www.eurocean.org/np4/home), [Marinetraining.eu](https://marinetraining.eu/), [EMODNET,](https://www.emodnet.eu/en) and other sources in the IOC [ODIS Catalogue of Sources](https://catalogue.odis.org/) (ODISCat). Based on feedback from the three pilot regions (noted below), the initial thematic focus of OIH will be on (i) experts and institutions/organizations, (ii) documents, (iii) Spatial data and maps, (iv) research vessels, (v) education and training opportunities, (vi) projects.

The project will benefit marine and coastal stakeholders across the globe, but its initial focus will be on responding to requests for data products and services from three regions: [Africa](https://oceaninfohub.org/partners/oih-africa-region/), [Latin America and the Caribbean](https://oceaninfohub.org/partners/oih-lac/) and [the Pacific Small Island Developing States](https://oceaninfohub.org/partners/psids/) to meet their unique user community requirements (thematic and linguistic). The initial priorities for the Project will be to develop communities of practice for the three pilot regions, as well as to formalize partnerships with other UN agencies and key international partners. Through these actions, the OIH will enable a digital ecosystem where users, from any entry point, can discover content and services that they require, while also having opportunities to become content creators themselves.

Matchmaking services mediated through ODIS-Arch would be an additional function of the OIH, particularly in support of the [IOC Capacity Development strategy](https://www.ioc-cd.org/). Services would allow study and training or vessel survey opportunities to be identified, a peer-to-peer service would support scientific collaboration, and an automated/self-serve service would allow the search for specific human or institutional expertise. 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, in line with the IOC’s Capacity Development strategy.

Following proof-of-concepts around its initial foci, the OIH’s flexibility, extensibility, and interfaces with other systems will allow it to help meet the knowledge needs of national and regional requirements for sourcing marine data and information. Further, its ability to federate a broad range of data and information providers will assist countries in their reporting requirements for the [Sustainable Development Goals](https://www.un.org/sustainabledevelopment/sustainable-development-goals/) (particularly goals 4, 9, 14 and 17), contribute to key aims of the [UN Decade of Ocean Science for Sustainable Development](https://www.oceandecade.org/), the [Paris Agreement](https://sustainabledevelopment.un.org/content/documents/17853paris_agreement.pdf), the [Sendai Framework for disaster Risk Reduction](https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030) and [Marine Biological Diversity of Areas Beyond National Jurisdiction.](https://www.un.org/bbnj/) The OIH will also assist IOC member states to report on ocean science capacities through the [Global Ocean Science Report](https://en.unesco.org/gosr) (GOSR). The Ocean InfoHub Project will therefore provide an opportunity for partners and users to contribute to, and access the UN Ocean Decade global data ecosystem.

As a direct contribution to the ODIS vision the Ocean InfoHub will:

1. Support the initial development of the ODIS interoperability architecture (ODIS-Arch) by developing technical guidelines and gathering reference implementations
2. Implement an “early implementer” network of data providers using ODIS-Arch (OIH partners)
3. Develop user stakeholder and rightsholder communities that can use the early implementer network and provide feedback on the network services, and user experience.
4. Develop and operate OIH in three initial regions: Latin America and the Caribbean, Africa and Pacific SIDS. These three regions are distinct with substantial differences in both data provider capability and user audiences.

Through interlinking communities with complementary needs and resources, this ongoing project will also directly support the objectives of the IOC Clearing House Mechanism for the Transfer of Marine Technology (TMT) and IOC Capacity Development strategy goals.

## 4.4 Partnership Centre for ODIS

Multilateral partnership is at the core of both OIH and ODIS. These efforts will develop and support multi-way digital exchange: within each region, the partners who interoperate through ODIS-Arch will simultaneously contribute data and information to a digital commons and have access to the contributions of others, either directly or through hubs such as OIH.

Within IODE it has been widely recognized that many of the 150 Member States currently do not have the required human and technical capacity to host online data and information services even when an NODC or ADU is present. As the stakeholder focus of OIH goes beyond the “traditional” IODE community it is fair to assume that the number of potential data and information sources that cannot host their own online services will be substantially higher than those we are aware of today. As such, we risk a huge amount of data and information being effectively invisible and unable to help us face humanity’s common challenges and meet our shared opportunities..

It is thus recommended that the efforts of the Partnership Center for IODE Ocean Data Portal (hosted by the Russian Federation in Obninsk) should be concentrated now on OIH/ODIS, rather than on standalone tools (its previous focus) . It is proposed that the IOC Partnership Centre for ODIS will support the digital ecosystem as follows:

1. Provide a toolkit that contains reference implementations of software that would enable nodes to ingest, describe, quality control, and transmit (meta)data to and from the Partnership Centre and other stakeholders;
2. Provide training and support as well as documentation for the use of ODIS-related software;
3. Provide secondary quality control of data/information received from stakeholders/providers through ODIS software (in terms of compliance with agreed methodologies);
4. Archive and make available online data sets received from the stakeholders/providers, if requested by the data provider;
5. Provide a secure archive/mirror of all stakeholders/providers who cannot ensure/assure the long-term and secure archival of their data/information, if requested;
6. Make all its data and information holdings available globally through the ODIS-Arch and systems like OIH;
7. Coordinate and broker, with their respective secretariats/hosts, the submission of data held by the Partnership Centre to the World Ocean Database (WOD) and Ocean Biodiversity Information System (OBIS);
8. Make all data and information managed by the Partnership Centre available through a mirror site at the IOC Project Office for IODE, Oostende, Belgium;
9. Report on activities to the IODE Management Group, including member state contacts, status of work (data hosting, data sharing, ODIS integration, data use, etc.).

The Partnership Centre for ODIS will furthermore contribute to the data as well as CD chapters of the UN Decade of Ocean Science for Sustainable Development.

The proposed Partnership Centre for ODIS will constitute an additional building block in ODIS, complementing the OIH as well as all other services implementing the ODIS architecture.

Within each region (initially Latin America, Africa and P-SIDS), partners without the necessary technology capacity will be able to share their data through the Partnership Centre. The Partnership Centre will service all current and future regional nodes. In some specific cases the Partnership Centre may also be requested to assist regional partners.

# COST BENEFIT ANALYSIS

We refer to Document [IOC-XXX/2 Annex 6](http://legacy.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=24645) (IOC Ocean Data and Information System (ODIS): Concept, implementation plan and cost benefit analysis) that identified Option 4: Stepwise development of ODIS leveraging existing infrastructure (ODISstep) as the preferred option with maximum benefits at a medium cost (Table 1).

Aside from its technical outputs, an immense benefit of Option 4 is the creation of a content development community with a common vision and shared coordination, with ODIS as its rally point. This will serve as a 'force multiplier', potentially amplifying and sustaining efforts.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Cost** | **Benefits** | **Weaknesses** |
| **Option 4: Stepwise development of ODIS leveraging existing infrastructures (ODISstep)** | Medium: $528,000[[2]](#footnote-2) | Maximum use of existing infrastructure, existing systems and existing expertise.  Creation of a community of developers around a common vision.  Minimum duplication of effort.  Multiple stakeholder communities.  Pooled and distributed ability to respond to user needs across scales as defined by stakeholder communities.  Gradual development allows more agile resource mobilization and proof of concept for each component. | Incremental advances may seem minor compared to ‘big bang’ advances by organizations working in silos (e.g. quicker delivery by short circuiting community engagement and shared ownership and management).  More difficult to gain and maintain interest by organizations having much to contribute, but who wish to move more quickly. |

Table 1: benefits and weaknesses of ODIS option 4 (Stepwise development of ODIS leveraging existing infrastructures (ODISstep))

This being said, there are a number of factors that will impede the development of the system and which need to be considered:

* Highly variable (meta)data storage and exchange formats
* Highly variable quality control methods and flags
* Semantic inconsistencies including:
  + At a high-level, varied definitions of “data set”, or even “data”, “information”, and “knowledge”;
  + Inconsistently applied controlled vocabularies and semantic description resources
* Widespread duplication of effort
* Unwillingness to share data freely and openly, despite existing IOC data policy
* Insufficient provenance tracking, including machine-readable licenses and restrictions/permissions
* Lack of (sufficient) data/information management plans in projects
* Lack of expertise to manage data and information
* Lack of sustained coordination, despite notable efforts.

Collectively, these factors impede machine-to-machine interoperability that will allow ODIS to leverage existing infrastructures and resources. However, consistent and concerted efforts from the IOC and IODE are already stimulating a new willingness for the ocean community to coherently address these issues.

A number of initiatives are trying to address some of the above, some regional and some global, and some of which involve IOC and its IODE (such as the Ocean InfoHub) but substantial efforts will still be required to resolve the above issues. This will be taken into account in the work plan.

It is essential that IOC, through ODIS becomes closely involved in these efforts to agree on global “best practices” or “standards” facilitating a truly global ocean data and information system that allows the discovery of and access to data at the data set (or even observation) level, as well as information, products and services using a “free and open” policy.

It is noted that partnerships with the private sector (IT) may be considered to assist with the development of ODIS. Some of these partnerships are being discussed or starting.

# PROJECT OBJECTIVES AND WORK PLAN

## 6.1 Project objectives

1. The ODIS Project will **develop the technology** and **collaborative culture** **(communities)** required *to build the IOC Ocean Data and Information System (ODIS) e-environment where users can discover data, data products, data services, information, information products and services provided by Member States, projects and other partners.* . Users and developers will access and build upon the resources of multiple components, through the interfaces of any single component. The project will further build upon the **“proof-of-concept reference architecture” (ODIS-Arch),** developed by the Ocean InfoHub project (see heading 4.3) that will enable multiple data systems to interoperate with IOC systems and with each other across a range of information types through machine-to-machine interactions. This will initiate a process to remedy the current lack of automated and scalable communication between the many (hundreds) of marine data and information systems, such that both developers and end users must query and download from each online source, often expending immense resources to contend with a multitude of shifting formats and conventions.
2. The project will **test the developed technology** through demonstrator sub-projects developed with regional data and information nodes to meet the needs of their users. Technology and capacities developed through these demonstrators will then be shared through the ODIS network, as described below.
3. The project will **seek to** **add additional data and information provider systems**, based upon information available from the ODISCat catalogue of sources (see heading 4.1)
4. The project will, based upon the experience gained through the Ocean InfoHub project, develop (as requested by IOC Regional Subsidiary Bodies and other groupings of member states or partner organizations/programmes) **additional regional data and information nodes** to meet the needs of their users.
5. The project will provide a “**node hosting service”** for member states without the necessary infrastructure. This service will be provided by the “IODE Partnership Centre for ODIS”.
6. The project will provide **technical and procedural guidance documentation as well as related training** to assist data/information providers as well as diverse user communities with the necessary capacity to actively and equitably participate in ODIS.

## 6.2 Implementation strategy

The objectives listed under 6.1 will be implemented through a number of work packages. It is noted that for each of the work packages performance indicators will be identified. This will be done by the Steering Group (see WP1) at its first meeting, with advice and guidance by the IODE Steering Group for the Ocean InfoHub project.

Work packages

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

### 6.2.1 WORK PACKAGE 1: Project Management, coordination and evaluation

Summary:

This work package covers activities related to

- overarching coordination and guidance

- planning and budget management

- monitoring and reporting

- risk and issue management

- project evaluation.

Key Tasks:

A project-level advisory group will be established (called the **Steering Group** in this project to align with other IODE projects which have Steering groups).

The role of the Steering Group will be to:

(i) Propose the vision, strategy, work plan and timetable for the ODIS Project;

(ii) Advise on technical aspects;

(iii) Establish a stakeholder forum to ensure active participation of representatives from ODIS nodes and other contributors;

(iv) Report to the IOC and to other partners on the progress of the ODIS Project;

(v) Provide guidance to the project manager and project technical manager;

(vi) Identify funding sources to further develop the ODIS.

The membership of the Steering Group:

(i) Representatives from IOC Programmes;

(ii) Project Manager;

(iii) Project Technical Manager;

(iv) Invited Experts;

(v) Representatives of major stakeholder (user) groups including regional/international organizations;

(vi) Representative of the Decade Coordination Unit

(vii)Representative of the IODE Secretariat.

Project evaluation:

As is customary for large-scale projects, a project evaluation will be organized at regular intervals (as this will be a “persistent IODE project”. Modalities of the evaluation will be discussed and agreed upon at a later date.

Deliverables:

* D1.1 Annual progress reports
* D1.2 Project evaluation report

### 6.2.2 WORK PACKAGE 2: technology development and Global Hub operations

It is important to note that the ODIS project will have a solid base to build upon, delivered by the Ocean InfoHub project. As such the tasks of WP2 will be very similar and to some extent, continuation from the OIH WP2.

Summary:

This work package covers the technical developments needed to support the implementation of ODIS nodes and the proof-of-concept ODIS reference architecture (ODIS-Arch) which will allow the nodes to interoperate with each other and external systems. It also includes the establishment and operation of the technical aspects for the ODIS Partnership Centre.

Key tasks:

This work will include:

● Operation of a Global Hub (developed by OIH) to harvest from and monitor the diversity and health of the ODIS digital ecosystem (see 4.1) (located at the IOC Project Office for IODE, Oostende, Belgium)

● Further development and maintenance of Regional/Thematic Node applications (virtual nodes part of the Global Hub, separate software applications built around ODIS-Arch to be installed at regional/thematic node host, or existing data systems which have been aligned with the ODIS architecture)

● Continued population and quality control of ODISCat catalogue of sources, with automation advancements leveraging ODIS-Arch

* Establishment and operation of the Partnership Centre for ODIS (see 4.4)
* Continue to develop the ODIS-Arch and deliver all needed documentation for those who want to implement it

Deliverables:

* D2.1 Automated, periodic diagnostic reports from the Global Hub’s continued operation
* D2.2 Reference implementations and versioned source code delivering for regional node technologyD2.3 Automated, periodic diagnostic reports from the established and operational Partnership Centre for ODIS
* D2.4 Version controlled releases tracking the evolution and expansion of ODIS-Arch, as it covers more thematic areas and engages more diverse ocean communities
* D2.5 Extensive documentation on the operation of the Global Hub, regional nodes and ODIS-Arch.

During 2021, 2022 and early 2023 the ODIS project will join WP2 of the OIH project and will then, at the end of OIH (Phase 1, 2020-2023) take over the operational elements of OIH WP2 and further develop the technology framework (see objectives 1 and 2 above) .

### 6.2.3 WORK PACKAGE 3: network expansion

Summary:  
As mentioned the Ocean InfoHub project will develop a global node and a number of regional nodes in Latin America & Caribbean, Africa and Pacific SIDS during the period 2020-2023. The ODIS project will take on the further expansion of the network by (i) seeking additional data and information provider systems, based upon information available from the ODISCat catalogue of sources (project objective 3); (ii) develop (as requested by IOC Regional Subsidiary Bodies and other groupings of member states or partner organizations/programmes) develop additional regional data and information nodes to meet the needs of their users (objective 4).

These Hubs and Hublets (portals etc) are not replacing the function of other components/systems, but showing how to nimbly weave parts of their shared data together (with attribution) and keeping an eye on health of the system.

This work package covers implementation, testing and support necessary to establish the new/additional regional/thematic ODIS nodes and support them to the point where they are self-sustaining (e.g., all day-to-day support provided within the nodes, or externally based on formal agreement with the global node/IODE).

Deliverables:

* D3.1 Customization of regional ODIS Hubs, in collaboration with regional partners;
* D3.2 Functional and performance testing to verify integration between the regional/thematic and global nodes, ensuring acceptable performance by users, along with remediation of any issues encountered;
* D3.3 Technical and related support until required support capacity is in place within the node (see also WP 4);
* D3.4 Establishment of national/regional networks of content providers who will regularly make content available to the regional node;
* D3.5 Populating of the regional nodes with content received from the national/regional networks including quality control, reformatting, creating metadata, data entry.

### 6.2.4 WORK PACKAGE 4: capacity development

Summary:

This work package covers the training and capacity development needed to support the infrastructure and contributors/users of the global Ocean Infohub and regional nodes. (Objectives 5 and 6)

Key tasks:

This work package will focus on the development of a series of technical guidelines and procedures as well as online training modules and tutorials. The developed training materials can be used through self-paced online sessions or in-class/on-site sessions at regional nodes. All developed digital learning materials will be hosted on the Moodle platform which is fully integrated in the OceanTeacher Global Academy (<http://www.oceanteacher.org>). The use of the OceanTeacher Global Academy platform will avoid the development of a separate training platform and will therefore save resources. Furthermore, by hosting the materials in this dedicated learning environment it will be possible to easily monitor how many learners are using the developed materials. In addition, it will be possible to interact with the users following the online modules and as such get feedback on potential strengths and weaknesses in ODIS or in the available learning materials. If needed the network of OTGA Regional and Specialized Training Centres may organize dedicated training sessions.

Deliverables:

* D4.1 Operations manuals (administrators, content providers, end users) (to be made available in English, French, Spanish) covering the use of the Global Hub, installing and maintaining a regional/thematic hub, implementing the ODIS-Arch and contribution to the OIH, to be disseminated widely, particularly through OBPS and leveraging ODIS-Arch document specifications;
* D4.2 Online training courses (for administrators/node managers and content providers and end users) (to be made available in English, French, Spanish), to be disseminated widely, particularly through OBPS and leveraging ODIS-Arch training specifications;
* D4.3 Coordinated staffing, professional development, and other strategies for increasing base of skilled workers to undertake required support activities;
* D4.4 Communication skills course (for administrators/node managers).

### 6.2.5 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 ODIS global and regional/thematic nodes, to promote community participation in ODIS as contributors and users, and to solicit input needed to foster ongoing development of the ODIS nodes. Under this work package the project will also organize user consultations through online fora, surveys and other two-way communication methods and tools. Extensive use will be made of social media.

Note: it is noted that the project, throughout the implementation, will pro-actively seek collaboration and synergies with other UN agencies and regional organizations that have developed similar data/information systems, in order to achieve their interoperability with the ODIS. The UN Ocean Decade is a good opportunity to make this happen.

Note: it is also recommended to establish contact with communities that have data, information or knowledge but are currently unable to link to the system, as a preparative action to include them at a later date.

Deliverables:

* D5.1 Development and implementation of the ODIS communication plan including linkages between the project and national, regional, and global programs and objectives.
* D5.2 Presentations about the ODIS at the IOC Governing Bodies, Regional and other subsidiary body meetings, and other relevant venues.
* D5.3 News releases, success stories, and reusable presentation/communication materials (presentations, posters, flyers, etc.).
* D5.4 Global, regional and thematic mailing lists
* D5.5 Contributor and user feedback/satisfaction surveys.
* D5.6 Updated needs assessment and comparison with previous engagement.
* D5.7 Establish and populate social media channels.

# PROJECT STAKEHOLDERS: BENEFICIARIES AND PARTNERS

The ODIS project will serve the following user groups:

1. Scientists (academic and private sector)
2. Government agencies/policy makers
3. IOC global and regional programmes
4. IODE National Oceanographic Data Centres (NODCs), IODE Associate Data Units (ADUs) and IODE Associate Information Units (AIUs)
5. UN agencies, International Governmental Organizations (IGOs)Non-Governmental Organizations (NGOs)
6. Industrial and commercial enterprises
7. Citizen scientists and general public

It is important to note that the above-mentioned user groups are also those who provide content to the system. This will enhance the self-driven nature of the system and thus ensure its sustainability beyond the lifespan of the project. Furthermore, the distributed approach will allow further expansion of the “partner network” with new content providers as well as users, thereby further enriching the content ecosystem.

In addition, the project will target early career scientists and aim at mainstreaming initiatives that contribute to UNESCO’s global priority on gender equality, complemented by measures to reduce disparity, inequity, and underrepresentation along other axes of diversity.

# PROJECT IMPLEMENTATION TIMING

The below table provides an overview of the project implementation planning between 2021 and 2025. In this regard it is important to note that during the period 2021-2023 a number of activities will be undertaken jointly between the ODIS project and the Ocean InfoHub project (which ends early to mid-2023). Joint activities are marked **Y** in the table.

At a later stage the deliverables described under work packages 1 to 5 will be associated with the timeline described below (by the launching event or the Steering Group).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Key Activities** | **Year 1 (2021)** | | **Year 2 (2022)** | | **Year 3 (2023)** | | **Year 4 (2024)** | | **Year 5 (2025)** | |
| **S1** | **S2** | **S1** | **S2** | **S1** | **S2** | **S1** | **S2** | **S1** | **S2** |
| ***WP1: Project Management and Coordination*** |  |  |  |  |  |  |  |  |  |  |
| *1.1**Steering Group establishment* |  | *X* |  |  |  |  |  |  |  |  |
| *1.2 Meeting steering group (jointly with SG-OIH) (online or face-to-face)* |  | ***Y*** | ***Y*** | ***Y*** | ***Y*** | *X* | *X* | *X* | *X* | *X* |
| *1.3 Project regular evaluation* |  |  |  |  |  | *X* |  |  |  | *X* |
| ***WP2: Technology development and operations*** |  |  |  |  |  |  |  |  |  |  |
| *2.1* *operation of Global Hub* | ***Y*** | ***Y*** | ***Y*** | ***Y*** | ***Y*** | *X* | *X* | *X* | *X* | *X* |
| *2.2 further development and maintenance of Regional/Thematic Node application* | ***Y*** | ***Y*** | ***Y*** | ***Y*** | *X* | *X* | *X* | *X* | *X* | *X* |
| *2.3 continued population of ODISCat* | ***Y*** | ***Y*** | ***Y*** | ***Y*** | *X* | *X* | *X* | *X* | *X* | *X* |
| *2.4 establishment of the Partnership Centre for ODIS* |  | ***Y*** |  |  |  |  |  |  |  |  |
| *2.5 operation of the Partnership Centre for ODIS* |  | ***Y*** | *X* | *X* | *X* | *X* | *X* | *X* | *X* | *X* |
| ***WP3: network expansion*** |  |  |  |  |  |  |  |  |  |  |
| *3.1 implementation, testing and support necessary to establish the new/additional regional/thematic ODIS nodes and support them to the point where they are self-sustaining (1)* |  |  | *X* | *X* | *X* | *X* | *X* | *X* | *X* | *X* |
| ***WP4: Capacity development*** |  |  |  |  |  |  |  |  |  |  |
| *4.1 Operations manuals (administrators, content providers, end users) (to be made available in English, French, Spanish) (1)* | ***Y*** | ***Y*** | ***Y*** |  | *X* |  | *X* |  | *X* |  |
| *4.2 Online training courses (for administrators/node managers and content providers and end users) (to be made available in English, French, Spanish) (1)* | ***Y*** | ***Y*** | ***Y*** |  | *X* |  | *X* |  | *X* |  |
| *4.3 Coordinated staffing, professional development, and other strategies for increasing base of skilled workers to undertake required support activities (1)* |  |  | *X* |  | *X* |  | *X* |  | *X* |  |
| *4.4 Communication skills course (for administrators/node managers)* |  |  | *X* | *X* |  | *X* |  | *X* |  | *X* |
| ***WP5: Communication, users marketing and feedback:*** |  |  |  |  |  |  |  |  |  |  |
| *5.1 development and implementation of the ODIS communication plan* |  |  |  |  | *X* |  |  |  |  |  |
| *5.2 Presentations about the ODIS at the IOC Governing Bodies, Regional and other subsidiary body meetings, and other relevant venues* |  | ***Y*** | ***Y*** | *X* | *X* | *X* | *X* | *X* | *X* | *X* |
| *5.3 News releases, success stories, and reusable presentation/communication materials (presentations, posters, flyers, etc.).* |  | ***Y*** | ***Y*** | *X* | *X* | *X* | *X* | *X* | *X* | *X* |
| *5.4 Global, regional and thematic mailing lists* |  |  | ***Y*** | *X* | *X* | *X* | *X* | *X* | *X* | *X* |
| *5.5 Contributor and user feedback/satisfaction surveys.* |  |  |  | *X* |  | *X* |  | *X* |  | *X* |
| *5.6 Updated needs assessment and comparison with previous engagement* |  |  | *X* |  | *X* |  | *X* |  | *X* |  |

# TERMS OF REFERENCE OF THE IOC OCEAN DATA AND INFORMATION SYSTEM PROJECT

**Draft Recommendation IODE-XXVI/6.1.1**

The IODE Committee,

**Recalling** Decision IODE-XXIV.4 on the Ocean Data and Information System,

**Recognizing** that a major component of the ocean data and information system landscape is not linked to the IOC and the need to collaborate with those communities/systems in order to achieve improved accessibility, unrestricted use and interoperability of data and information,

**Recognizing** the key role that distributed and interoperable data, information, and digitized knowledge resources will have during the UN Decade of Ocean Science for Sustainable Development,

**Recalling** that the IOC decided that IODE will work with existing stakeholders, linked and not linked to the IOC, to improve the accessibility and interoperability of existing data and information, and to contribute to the development of a global ocean data and information system, to be referred to as the IOC Ocean Data and Information System, leveraging established solutions where possible, including existing IODE systems and others,

**Noting with appreciation** that IODE has:

(i) established the IOC Ocean Data and Information System Catalogue of Sources Project (ODISCat) in 2019;

(ii) started the implementation of the Ocean InfoHub project as a three year project (2020-2023) funded by the Government of Flanders (Kingdom of Belgium).

**Having examined** Document IOC/IODE-XXVI/6.1.1 (Proposal for the Establishment of the IOC Ocean Data and Information System (ODIS),

**Recommends** the establishment of the “IOC Ocean Data and Information System (ODIS)” with the terms of reference as attached in Annex A, and terms of reference of the Steering Group as attached in Annex B to this recommendation,

**Invites** all IOC programmes, IOC regional subsidiary bodies and partner organizations to collaborate by mobilizing their stakeholder communities to enter information into the ODIS-Cat system, and to participate in the OIH and ODIS Projects.

**Annex A to Recommendation IODE-XXVI/6.1.1**

**Terms of Reference of the IOC Ocean Data and Information System (ODIS)**

Objectives

The objectives of this project are to:

(i) develop the IOC Ocean Data and Information System (ODIS) as an e-environment where users can discover data, data products, data services, information, information products and services provided by Member States, projects and other partners associated with IOC.

(ii) work with partners, linked and not linked to the IOC, to improve the accessibility and interoperability of existing data and information. It will contribute to the development of a global ocean data and information system, to be referred to as the IOC Ocean Data and Information System, leveraging established solutions where possible.

(iii) start its development using already existing “ecosystem component” such as, *inter alia*, the ODIS Catalogue of Sources ODISCat, the Ocean InfoHub project, and all IODE data and information products and services, and to add components within and outside the IODE programme as these become available to and interoperable with the ODIS ecosystem.

**Annex B to Recommendation IODE-XXVI/6.1.1**

**Terms of Reference of the IODE Steering Group for the**

**IOC Ocean Data and Information System (ODIS)**

Objectives

The SG-ODIS will have the following Terms of Reference:

(i) Propose the vision, strategy, work plan and timetable for the ODIS Project;

(ii) Advise on technical aspects;

(iii) Establish a stakeholder forum to ensure active participation of representatives from ODIS nodes and other contributors;

(iv) Report to the IOC and to other partners on the progress of the ODIS Project;

(v) Provide guidance to the project manager and project technical manager;

(vi) Identify funding sources to further develop the ODIS.

Membership

The Steering Group will be composed, *inter alia*, of:

(i) Representatives from IOC Programmes;

(ii) Project Manager;

(iii) Project Technical Manager;

(iv) Invited Experts;

(v) Representatives of major stakeholder (user) groups including regional/international organizations;

(vi)Representative of the IODE Secretariat;

(vii) Representative of the Decade Coordination Unit.

Notes: The Steering Group will designate the Project manager/editor during its first Session

# COSTING

A preliminary costing estimate was prepared in Document [IOC-XXX/2 Annex 6](http://legacy.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=24645) (IOC Ocean Data and Information System (ODIS): Concept, implementation plan and cost benefit analysis) and has been updated in terms of detail and for a period of five years (2021-2025).

As the establishment of additional regular UNESCO positions is extremely difficult (possibly impossible until 2024) **Member States are invited to consider long-term secondments to either the IOC Project Office for IODE, Oostende, Belgium or as “virtual secondments” whereby the seconded staff works from his/her usual place of work.**

Cost components:

Component 1: ODIS Secretariat operations

Component 2: Capacity Development (through Ocean InfoHub Phase 1 and beyond)

* Sub-component 2.1: Partnership Centre for ODIS
* Sub-component 2.2: Assistance to Member States to join the network
* Sub-component 2.3: Assistance to Member States and individual users to use the services

Component 3: Further development and maintenance of ODISCat

Component 4: National activities related to ODIS participation

## Component 1: ODIS Secretariat operations

Tasks:

* Day-to-day oversight of the network
* Assistance to network members (data providers, data users)
* Further development, maintenance of technology guidance materials and promoting their availability through OBPS
* Implementing capacity development (in cooperation with OceanTeacher Global Academy, OBPS and Ocean InfoHub)
* Close collaboration with Ocean InfoHub work package 2 (technology development) as well as other relevant OIH WPs
* Maintain connection of IOC/IODE data and information systems, products and services in the network (OBIS, WOD, AquaDocs, OceanExpert, OBPS,...)
* Coordinate connection of additional IOC data/information products and services with ODIS network

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** → **Cost item** ↓ | 2021  (in US$) | 2022  (in US$) | 2023  (in US$) | 2024  (in US$) | 2025  (in US$) | Total  (in US$) |
| Project preparation meeting (1) | $30,000 |  | - |  |  | $30,000 |
| HR: Project Manager (2) | - | 159,500 | 159,500 | 159,500 | 159,500 | 638,000 |
| HR: System engineer (IT) (3) | - | 159,500 | 159,500 | 159,500 | 159,500 | 638,000 |
| HR: Content management and user support (QC) (4) | - | 60,000 | 60,000 | 60,000 | 60,000 | 240,000 |
| Project management (annual meeting, travel) | - | 40,000 | 40,000 | 40,000 | 40,000 | 160,000 |
| **TOTALS** | **30,000** | **419,000** | **419,000** | **419,000** | **419,000** | **1,706,000** |

1. This could be an online event (cost = 0) [Most likely]
2. Project manager: international position P-3 level
3. System engineer: international position P-3 level
4. Content management and user support (consultant)

## Component 2: Capacity Development (through Ocean InfoHub Phase 1 and beyond)

Capacity development will be a priority for the various communities that will participate in ODIS:

* Many data/information centres (IODE and others, including regional and international partner organizations) that wish to participate in ODIS as “content providers” will require capacity development assistance to “connect” their data/information systems to the ODIS network. Documentation (guidelines, manuals) will be prepared and made available (preferably through OBPS). Training courses (online or face-to-face) will be organized through close collaboration with the OceanTeacher Global Academy (OTGA) and its network of Regional Training Centre (RTCs) and Specialized Training Centres (STCs) (see <http://www.oceanteacher.org>).
* The community model developed by the Ocean InfoHub project in three regions will generate various user communities that will wish to extract data and information from the network. Fit-for-purpose training materials and training sessions will need to be developed and delivered (in various languages).

### Sub-component 2.1: Partnership Centre for ODIS

In order to increase participation in ODIS by regions lacking technical infrastructure, the Partnership Centre for ODIS will provide a number of enabling services:

* For content providers who lack IT capacity, the Partnership Centre for ODIS will provide hosting and archival support as an interim measure to enable the partners to participate in ODIS.
* Support/training for content submission, including development/adoption of tools necessary to facilitate the submission process will also be provided.
* The Partnership Centre for ODIS will also work with the Project Office for IODE to establish a secondary mirror of submitted data for disaster recovery purposes.
* In order to simplify the process of markup of metadata aligned to ODIS-Arch, the Partnership Centre for ODIS will support content providers through development of a toolkit containing metadata templates and other technical resources and provision of direct support.

### Sub-component 2.2: Assistance to Member States to join the network

Member States with be supporting in their participation in OIH and ODIS through multiple channels:

* The communication channels and collaborative code development solutions, established through OIH will continue to evolve as key channels for Member States to engage with the OIH/ODIS contributor, user, and developer communities.
* In-person and online (interactive and self-paced) training will be developed and delivered through OTGA and other venues.

### Sub-component 2.3: Assistance to Member States and individual users to use the services

Although all efforts will be made to make the system intuitive, users in Member States may still require guidance and assistance to make use of ODIS services (end point). While regions may set up “portals” that allow data/information search and retrieval and possibly on-the-fly creation of products (eg GIS maps), some manuals may be needed. Under this project component such CD tools will be developed as documents and/or e-learning modules or training videos. In addition, assistance through chat and/or email may be developed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** → **Cost item** ↓ | 2021  (in US$) | 2022  (in US$) | 2023  (in US$) | 2024  (in US$) | 2025  (in US$) | Total  (in US$) |
| Sub-component 2.1: Partnership Centre for ODIS (1) | 0 | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| Sub-component 2.2: Assistance to Member States to join the network | 0 | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| Sub-component 2.3: Assistance to Member States to use the services | 0 | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| **TOTALS** | **0** | **60,000** | **60,000** | **60,000** | **60,000** | **240,000** |

## Component 3: Further development and maintenance of ODISCat

Tasks:

* Quality control of new entries
* Mapping of data sources (e.g., for IODE data centres)
* Promotion of data contribution to IODE data systems OBIS and WOD, and contribution of information to IODE information systems (AquaDocs, OBPS,...)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** → **Cost item** ↓ | 2021  (in US$) | 2022  (in US$) | 2023  (in US$) | 2024  (in US$) | 2025  (in US$) | Total  (in US$) |
| HR: Project Manager (1) | - | 0 | 0 | 0 | 0 | 0 |
| HR: System engineer (IT) (1) | - | 0 | 0 | 0 | 0 | 0 |
| HR: Content management and user support (QC) (2) | 30,000 | 60,000 | 60,000 | 60,000 | 60,000 | 270,000 |
| Project management (annual meeting, travel) (3) | - | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| **TOTALS** | **30,000** | **80,000** | **80,000** | **80,000** | **80,000** | **350,000** |

1. In-kind contribution by the Government of Flanders (Kingdom of Belgium) through the Flanders Marine Institute (IT system engineer)
2. Content management and user support (consultant)
3. 2021: online; 2022-2025: annual meeting

## Component 4: National activities related to ODIS participation

In order to keep the project sustainable over a long period of time the costs associated with participation of Member States in ODIS will need to be in-kind contributions through staff time, infrastructure and operational costs. However as most national data and information management structures (NODCs, ADUs, AIUs, other marine libraries) are already established, the additional cost should be minimal, as soon as the minimum technical requirements have been covered (implementation of interoperability technology). For the latter, the project will provide guidelines as well as training (see Component 2).

## Overall costing table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** → **Cost item** ↓ | 2021  (in US$) | 2022  (in US$) | 2023  (in US$) | 2024  (in US$) | 2025  (in US$) | Total  (in US$) |
| COMPONENT 1 | **30,000** | **419,000** | **419,000** | **419,000** | **419,000** | **1,706,000** |
| COMPONENT 2 | **0** | **60,000** | **60,000** | **60,000** | **60,000** | **240,000** |
| COMPONENT 3 | **30,000** | **80,000** | **80,000** | **80,000** | **80,000** | **350,000** |
| COMPONENT 4 | 0 | 0 | 0 | 0 | 0 | **0** |
| **TOTALS** | **60,000** | **559,000** | **559,000** | **559,000** | **559,000** | **2,296,000** |

[end of document]

1. Wilkinson, M. D, et al (2016) The FAIR Guiding

   Principles for scientific data management and stewardship. Scientific Data, 3:160018 , DOI: 10.1038/sdata.2016.18 [↑](#footnote-ref-1)
2. This amount assumed certain staff costs would be provided as in-kind contributions and costing dated from 2017. [↑](#footnote-ref-2)