Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

IOC Committee on International Oceanographic Data and Information Exchange

Twenty-seventh Session

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Abstract

The IOC Committee on International Oceanographic Data and Information Exchange held its 27th session (IODE-XXVII) at UNESCO Headquarters, Paris, France between 22 and 23 March 2023. The IODE session was attended by 112 participants from 38 IOC Member States and 16 organizations. During its 27th session, the Committee focused its attention mainly on the following key issues: (i) 2023 revision of the IOC Strategic Plan for Ocean Data and Information Management (2023-2029); (ii) IOC Data Policy and Terms of Use (2023); (iii) establishment of the Underway Sea Surface Salinity Data Archiving Project (GOSUD); (iv) revision of the structural elements of the IODE Programme and working methods; (v) rules of procedure for IODE projects; (vi) increased collaboration of IODE with IOC programmes as well as the Ocean Decade; (vii) work plan and budget for 2023-2024. The Committee adopted two decisions and three recommendations.

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* An executive Summary of this report is available in English, French, Russian and Spanish.

Group photo IODE-XXVII

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Annexes

1. OPENING

1 The Session was opened by the IODE Co-Chairs **Dr Sergey Belov**. He welcomed the participants to the twenty-seventh Session of the IODE Committee.

2 In his opening words **Dr Vladimir Ryabinin**, IOC Executive Secretary, recalled the current IOC portfolio composed of six elements: ocean research, ocean observations & data management, early warning and services, sustainable management and governance, and assessment information for policy. Across all these is capacity development. Dr Ryabinin noted that the financial situation of IOC and IODE has been at a critical level in 2022-2023. He explained that for 2024-2025 two scenarios will be presented to the UNESCO General Conference in November 2023: base case vs ZNG (zero nominal growth). The base case will result in a substantial increase for IOC and its IODE while the ZNG will keep the budget at its current level. The 55th Session of the IOC Executive Council was requested to estimate the needed budget and resource assessment for an "optimal IOC". This would include a staff increase from 60 to 90, a budget increase from 30M$ to 50M$, to be achieved through "core voluntary contributions". Dr Ryabinin then provided an overview of key IOC influencers and motivators such as SDG 14, the Brest Forum, 2025 United Nations Ocean Conference, Climate, CBD (Convention on Biological Diversity), BBNJ (Marine Biodiversity of Areas Beyond National Jurisdiction), sustainable ocean economy, the Decade of Ocean Science for Sustainable Development, and sustainable ocean planning. Dr Ryabinin invited Member States to consider sustainable ocean planning in the deliberations and in national priorities whereby IOC evolves through the Decade to Sustainable Ocean planning in which ODIS/OIH will play a key role.

3 In his opening address **Mr Ariel Troisi**, IOC Chair, recalled that the last *in presentia* meeting of IODE had taken place in 2019 in Tokyo, Japan. In 2021 we had to work online due to Covid-19 and that forced us to re-assess the way we work post-Covid. Mr Troisi noted that ocean data is not just a technical issue - it is a moral imperative. Ocean data is essential in identifying the impact of human activities on the oceans and developing solutions to address them. It is also critical in predicting the effects of climate change on our oceans and developing mitigation and adaptation strategies. However, despite its importance, ocean data faces many challenges. One of the primary challenges is the lack of data. Many areas of the oceans remain unexplored, and we do not have sufficient data to understand their ecosystems fully. We need to work together to develop new technologies and methods to collect data in these areas and improve our understanding of the oceans. Another challenge is the quality of data. The data collected needs to be accurate, reliable, and standardized. We need to develop protocols and standards to ensure that the data collected is of high quality and can be used for scientific analysis and decision-making. Data management is another significant challenge. We need to develop effective data management systems that ensure data is easily accessible, organized, and available for analysis. We need to work together to develop data sharing protocols that enable scientists and policymakers to access and use data freely and efficiently. Moreover, we need to ensure that the data collected is used to develop solutions that benefit both people and the planet. We need to work together to develop policies and interventions that promote sustainable and equitable development and ensure that the benefits of ocean resources are shared fairly. Not only have we had to learn to function and fulfil our mission in the midst of the restrictions imposed by the pandemic, but also, in the particular case of IODE, we have had to face the important challenges derived from the budgetary situation and the availability of human resources. This has been due to general circumstances that affected both the Intergovernmental Oceanographic Commission and UNESCO. Ocean data and

information, along with sustained observations and capacity development, form the very foundation of knowledge and informed decision-making. It is this community of practice that carries a great responsibility on its shoulders and for which it has more than demonstrated that it is up to the demands of the moment.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

4 The Committee was invited by the Technical Secretary, **Mr Peter Pissierssens**, to review and adopt the provisional agenda (Document IOC/IODE-XXVII/1 prov.) available from the web site on https://oceanexpert.org/event/3615. The Committee was requested to note that all working documents were made available only as on-line documents. Any new items or issues proposed by the Meeting were noted here and discussed either under the related Agenda Item or under Agenda Item 9. Two additional discussions items were added under Agenda item 9. The Agenda is attached as Annex I.

5 **The Committee adopted** the agenda.

2.2 DESIGNATION OF A RAPPORTEUR

6 **Mr Pissierssens** invited the Committee to elect a Rapporteur for the Session. It was recalled that for the past four sessions the Secretariat was tasked to report on the meeting and that no rapporteur was used.

7 **The Committee**, considering the limited size of most delegations, **decided not to designate a Rapporteur**, and **tasked** the Secretariat and Co-Chairs with the reporting of the Meeting.

2.3 SESSION TIMETABLE AND DOCUMENTATION

8 **Mr Pissierssens** invited to review and adopt the Timetable (**Document IOC/IODE-XXVII/1 Add. Prov.**) available from the web site. He informed the Committee that plenary meetings would be held on Wednesday 22 March and Thursday 23 March, starting at 0930 until 1100 followed by a 30 min. break and then between 1130 and 1300. The afternoon session would start 1430 until 1600 followed by a 30 min. break and then continue until 1800.

9 The IODE Technical Secretary then reviewed the arrangements for the Session and presented the List of Documents available online through https://oceanexpert.org/event/3615. He noted that the main working document for the Session would be the Action Paper, **Document IOC/IODE-XXVI/2**. He further informed the Committee that the Action Paper had been translated into French, Spanish and Russian. These were the result of machine translation followed by proofreading carried out by the IOC Project Office for IODE (French), INVEMAR (Spanish) and RIHMI-WDC (Russian). **The Committee thanked** the Project Office, INVEMAR and RIHMI-WDC for assisting with the translation of the Action Paper.

10 All draft Recommendations and draft Decisions were included in the Action Paper and would be briefly reviewed during the concerned agenda item for final adoption during the final day of the Session. The adopted decisions and recommendations are attached as Annex II.

11 **The Committee adopted** the timetable for the Session.

2.4   ESTABLISHMENT OF SESSIONAL WORKING GROUPS

12   The Technical Secretary, **Mr Peter Pissierssens**, informed the Committee that sessional working groups could be established to deal with specific issues that cannot be discussed at length during the plenary. Suggested groups included:

   a.   Sessional working group on work plan and budget

   b.   Sessional working group on the future of IODE

13   Mr Ariel Troisi (Argentina) proposed to consider the review of structure and working methods. He referred to agenda item 6 (Future of IODE) and the sessional working group on this topic, but he felt that there would be a need for intersessional work. The Committee agreed that the draft decision for an IWG will be discussed by the SWG on the future of IODE and would be discussed under Agenda Item 9 (Any other business).

14   The Technical Secretary reminded the Committee that participants had been invited (by email) to identify the need for additional sessional working groups by email, prior to the Session. He informed the Committee that no suggestions were made.

15   He reminded the Committee that each Sessional Working Group should nominate a Chair who will report back to the Committee at the time the relevant agenda item is discussed in plenary. In exceptional circumstances the Committee may decide to re-arrange the timetable to accommodate a sessional working group.

16   Meetings of Sessional Working Groups were held on Wednesday during lunch time.

2.5   TECHNICAL ARRANGEMENTS

17   The Technical Secretary, **Mr Peter Pissierssens**, informed the Committee on rooms to be used for the sessional working groups. He also informed the Committee that interpretation English/Spanish would be available for the Session. The list of participants of the Session is attached as Annex III. A list of acronyms is available on https://oceanexpert.org/document/32010.

3.   REPORT ON THE PAST INTER-SESSIONAL PERIOD (2021-2022)

3.1   PROGRESS REPORT ON THE IODE-XXVI WORK PLAN (IODE-XXVI ACTION SHEET)

18   This agenda item was introduced by **Mr Greg Reed,** IODE Consultant. He recalled that the IODE Management Group, during their online meeting between 21-22 March 2022 had reviewed progress of the implementation of the IODE-XXVI work plan, decisions, and recommendations, and had composed a first draft proposed work plan and budget to be discussed by IODE-XXVII. The report of the 21-22 March 2022 IODE Management Group meeting was available as Document IOC/IODE-MG-2022/3. The updated action sheet is available   from https://iode.org/index.php?option=com_content&view=article&id=652&Itemid=100198

19   He listed the actions that were not implemented:

> *60   The Committee invited NODCs/ADUs/AIUs that require training in QMF to contact Ms Claudia Delgado (OceanTeacher Global Academy) to plan such courses as soon as possible: NO PROGRESS REPORTED*

> *99/100 The Committee recommended to allocate funds in the 2021 budget for the redesign of the IODE web site, taking into account the recommendations of the review: meetings took place of working group but due to lack of funds, no progress was made*

> *186   The Committee, while noting the difficulty to establish new regular positions within IOC and the similar needs of other programmes within IOC, both old and new, called on the Executive Secretary to consider the long-term sustainability of the IODE programme when preparing the IOC staffing plan for the next biennial: No action taken by IOC Executive Secretary. The MG re-iterated the IODE Committee request to the IOC Executive Secretary.*

20   Mr Reed concluded that most IODE-XXVI Action Sheet items had been completed during the inter-sessional period and referred discussions on actions that had not been completed to the relevant agenda items.

21   **The Committee noted with satisfaction** the level of completion of the IODE-XXVI action sheet.

22   IODE XXVI Decisions

1. Decision IODE-XXVI.4.1.2: IODE OCEAN DATA AND INFORMATION NETWORKS (ODINs): See agenda item 3.3

2. Decision IODE-XXVI.6.1.2: REVISION OF THE TERMS OF REFERENCE OF THE PARTNERSHIP CENTRE FOR THE IODE OCEAN DATA PORTAL: See agenda item 6.3

3. Decision IODE-XXVI.6.2: IODE CONTRIBUTIONS TO THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT (2021-2030) AND ESTABLISHMENT OF AN IODE INTER-SESSIONAL WORKING GROUP: See agenda item 6.1

4. Decision IODE-XXVI.6.3: ESTABLISHMENT OF AN INTER-SESSIONAL WORKING GROUP TO REVISE THE IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION MANAGEMENT: See agenda item 6.2

5. Decision IODE-XXVI.8.2: ESTABLISHMENT OF THE AQUADOCS PROJECT: See agenda item 3.1

23   IODE-XXVI Recommendations

1. Recommendation IODE-XXVI/6.1.1: ESTABLISHMENT OF THE IOC OCEAN DATA AND INFORMATION SYSTEM PROJECT (ODIS): completed. See agenda item 3.11

2. Recommendation IODE-XXVI.6.4: REVISION OF THE IOC OCEANOGRAPHIC DATA EXCHANGE POLICY (2003, 2019): completed. See agenda item 6.4

3. Recommendation IODE-XXVI.6.5: THE UNESCO/IOC PROJECT OFFICE FOR IODE IN OOSTENDE, BELGIUM: completed. See agenda item 6.5

4. [Recommendation IODE-XXVI. 8.3](#): IODE WORK PLAN AND BUDGET FOR 2021-2022. Adopted by IOC Assembly (June 2021)

24 <mark>**The Committee noted with satisfaction** the progress with implementation of the IODE-XXVI decisions and recommendations.</mark>

3.1.1 Outcome of IOC-31

25 This agenda was introduced by **Mr Taco De Bruin,** IODE Co-Chair. He informed the Committee that he had reported about the 26th Session of the IODE Committee to the 31st Session of the IOC Assembly in June 2021. The Assembly adopted Decision A-31/3.4.2 (International Oceanographic Data and Information Exchange).

International Oceanographic Data and Information Exchange

The Assembly,

I – 26th Session of IODE, 20–23 April 2021

Having examined the Executive Summary Report of the 26th session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE-XXVI, 20–23 April 2021) ([IOC/IODE-XXVI/3s](#)),

Endorses the report of the 26th session of the IOC Committee on International Oceanographic Data and Information Exchange including the recommendations and workplan for 2021–2022 contained therein;

Agrees that the regular budget for these activities will be identified as part of the Resolution on Governance, Programming and Budgeting Matters of the Commission (IOC Resolution A-31/2);

II – Establishment of the IOC Ocean Data

and Information System Project (ODIS)

Having examined the proposal contained in document IOC/A-31/3.4.2.Doc and document IOC/IODE-XXVI/6.1.1,

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

Recognizing that a significant fraction of the work on ocean data and information system takes place outside IOC and that there is a need to collaborate with those communities/systems in order to achieve improved accessibility, unrestricted use and interoperability of data and information,

Recognizing also 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 further 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),

Decides to establish the "IOC Ocean Data and Information System (ODIS) project" with the terms of reference as attached in Annex 1, and terms of reference of the Steering Group as attached in Annex 2 to this decision;

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

Annex 1 to Dec. A-31/3.4.2

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

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 existing "ecosystem components" 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 2 to Dec. A-31/3.4.2

**Terms of Reference of the IODE Steering Group
for the IOC Ocean Data and Information System (ODIS)**

Objectives:

(i)   Propose the vision, strategy, workplan 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:

- Representatives from IOC Programmes;
- Project Manager;
- Project Technical Manager;
- Invited Experts;
- Representatives of major stakeholder (user) groups including regional/international organizations;
- Representative of the IODE Secretariat;
- Representative of the Decade Coordination Unit.

III – Revision of the IOC Oceanographic Data Exchange Policy (2003, 2019)

Having examined the proposed arrangements contained in document IOC/A-31/3.4.2.Doc(2),

Recalling IOC Resolution XXII-6 that established the IOC Oceanographic Data Exchange Policy in 2003 and Decision IOC-XXX/7.2.1(II) that amended Clause 5 in 2019,

Noting that partner and sister organizations are changing their data policies, which can serve as a model for updating the IOC data policy,

<u>Noting further</u> that principles of data sharing and licensing are becoming globally recognized and adopted, e.g., FAIR Principles and Creative Commons licences,

<u>Decides</u> to establish the IOC inter-sessional working group on the Revision of the IOC Oceanographic Data Exchange Policy (2003, 2019) with terms of reference as included in Annex 3 to this decision;

Annex 3 to <u>Dec. A-31/3.4.2</u>

Terms of Reference of the IOC Inter-sessional Working Group on the Revision of the IOC Oceanographic Data Exchange Policy (IWG-DATAPOLICY)

<u>Objectives</u>: This working group will:

- (i) create an inventory of existing international, national and organizational data policies,
- (ii) review and compare existing international, national and organizational data policies,
- (iii) develop a glossary with clear definitions (e.g. open vs free and unrestricted; data vs metadata vs information, licence options),
- (iv) investigate the expansion of scope and name of the IOC Oceanographic Data Exchange Policy,
- (v) gather advice from partner/sister organizations and recognized data provider/manager organizations,
- (vi) organize a broad consultation on the proposed revised IOC Ocean Data Policy with Member States, IOC global and regional programmes,
- (vii) submit a revised IOC Oceanographic Data Exchange Policy to the IOC Assembly at its 32nd Session in 2023.

<u>Modalities</u>: The IWG-DATAPOLICY aims to have at least three meetings (second half 2021, first half 2022). The group may meet online, face-to-face or mixed as appropriate. For face-to-face meetings participation will be self-funded.

<u>Membership</u>: The IWG-DATAPOLICY will be composed, inter alia, of:

- · Chair of the working group (to be designated by the group)
- · Invited experts from the global data and information communities including UN agencies
- · Representatives of IOC programmes and projects
- · IOC (including IODE) Secretariat

IV – The UNESCO/IOC Project Office for IODE

<u>Having examined</u> the Proposal to renew the MoU between VLIZ and the IOC regarding the IOC Project Office for IODE contained in document IOC/A-31/3.4.2.Doc(3),

<u>Recalling</u>:

- (i) IOC Resolution XXII-7 which accepted the offer of the Government of Flanders (Kingdom of Belgium) and the city of Ostend to host the IODE Project Office,
- (ii) IOC Resolution XXII-1 which adopted the Guidelines for the Establishment of IOC Decentralized Offices, subsequently published in Document IOC/INF-1193,

<u>Noting with appreciation</u>:

- (i) the positive results of the review the IOC Project Office for IODE (2020 presented in document is IOC/A-31/3.4.2.Doc(3)),
- (ii) that the IOC Project Office for IODE has been successfully implementing its objectives:
    - o the successful development and hosting of data/information products/services such as web sites and databases,
    - o the successful development and hosting of the training system OceanTeacher Global Academy,

> o the continued management of an excellent international meeting and conference centre,
>
> (iii) the considerable financial support provided by the Government of Flanders (Kingdom of Belgium) to the IOC in general and to the IOC Project Office for IODE in particular, and the excellent in-kind support provided by the Flanders Marine Institute (VLIZ),
>
> (iv) the complementary nature of the activities carried out at the Project Office and the financial support provided by the Government of Flanders (Kingdom of Belgium) through the UNESCO/Flanders Fund-in-Trust for the support of UNESCO's activities in the field of Science (FUST),
>
> (v) the contribution by the IOC Project Office for IODE (as the IODE Secretariat and Meeting & Training Facility) to the further development of Ocean Data and Information Networks in developing regions,
>
> (vi) the efficient and effective management of the Project Office and the professionalism of its Staff,

Expressing its profound gratitude to the Government of Flanders (Kingdom of Belgium) and the Flanders Marine Institute (VLIZ) for the considerable support provided, both financially and by hosting the Project Office since April 2005,

Invites the Government of Flanders to continue hosting the IOC Project Office for IODE as well as its considerable financial and in-kind contributions and support;

Agrees to

> (i) the continuation of the IOC Project Office for IODE; and
>
> (ii) the renewal of the Memorandum of Understanding between UNESCO/IOC and the Government of Flanders (Kingdom of Belgium) through the Flanders Marine Institute (VLIZ) that establishes the IOC Project Office for IODE in Ostend, Belgium.

3.2   STATUS OF THE IODE NETWORK

3.2.1   New NODCs, ADUs, AIUs, accredited NODCs, ADUs, and AIUs

26   This agenda item was introduced by **Mr Greg Reed**, IODE Consultant and Chair of the SG-QMF (Quality Management Framework)**,** referring to URL https://www.iode.org/datacentres. He recalled the objectives of the IODE Quality Management Framework are to (i) provide the overall strategy, advice and guidance to NODCs (National Oceanographic Data Centres) to establish organizational quality management systems for the delivery of oceanographic and related data, products and services, (ii) initiate and review existing standards and Manuals and Guides with respect to the inclusion of quality management procedures and practices, and (iii) apply the necessary capacity development activities to ensure accreditation of NODCs according to agreed criteria in order to bring all NODCs to a minimum agreed level

27   During the intersessional period, three applications for (re)accreditation have been reviewed and recommended by the SG-QMF and the following NODCs / ADUs (Associate Data Units) have received accreditation:
* South African Marine Information Management System (MIMS) has been awarded the status of Accredited IODE Associate Data Unit.
* Marine Institute, Ireland has been re-accredited and maintains the status of Accredited IODE National Oceanographic Data Centre
* Norwegian Marine Data Centre (NMD) has been awarded the status of Accredited IODE National Oceanographic Data Centre.

28   In response to an email sent by the IODE Secretariat on 3 August 2022, twelve NODCs and ADUs have expressed interest in accreditation but have not yet taken action.

29 Mr Reed noted that only 10 NODCs and 2 ADUs were now accredited by IODE, namely, NODC Belgium (BMDC), NODC Belgium/Flanders (VLIZ), NODC China (NMDIS), NODC France (SISMER), NODC Islamic Republic of Iran (INCOD), NODC Ireland (Marine Institute), NODC Japan (JODC), NODC Republic of Korea (KODC), NODC United Kingdom (BODC), NODC Norway (NMD), ADU Malaysia (INOS) and ADU South Africa (MIMS).

30 During the past inter-sessional 2 Member States (Panama, Portugal) established an NODC, and 7 organizations sent in ADU applications, including one that also applied for accreditation (South Africa MIMS). One AIU (Associate Information Unit) application was received from the SEAFDEC Aquaculture Department (SEAFDEC/AQD) (Philippines) in 2021 and approved, bringing the total number of AIUs to 6.

31 IODE-XXVI had invited (i) Estonia (Tallinn University of Technology); (ii) Finland (Finnish Meteorological Institute); (iii) Portugal (Instituto Hidrografico); and (iv) Trinidad and Tobago (Institute of Marine Affairs) to join the IODE network as NODC or ADU. Regrettably only one (Portugal) informed the IODE Secretariat of any steps taken.

32 Figure 1 shows the evolution of establishment of NODCs, accreditation of NODCs, applications (and establishment) of ADUs and accreditation of ADUs between 2010 and 2022. The figure shows that the impact of the adoption of Recommendation IODE-XXII.16 (IODE Associate Data Unit (ADU)) which established the ADU as a new structural element of IODE had an immediate impact with 1 application in 2013, 11 in 2014 and 8 in 2015. OBIS nodes were especially responsive, requesting to be recognized as IODE ADUs. Similarly in response to Recommendation IODE-XXII.16 which established the IODE Quality Management Framework (IODE-QMF) accreditation applications from NODCs were received largely in 2017 (6) and 2018 (3).
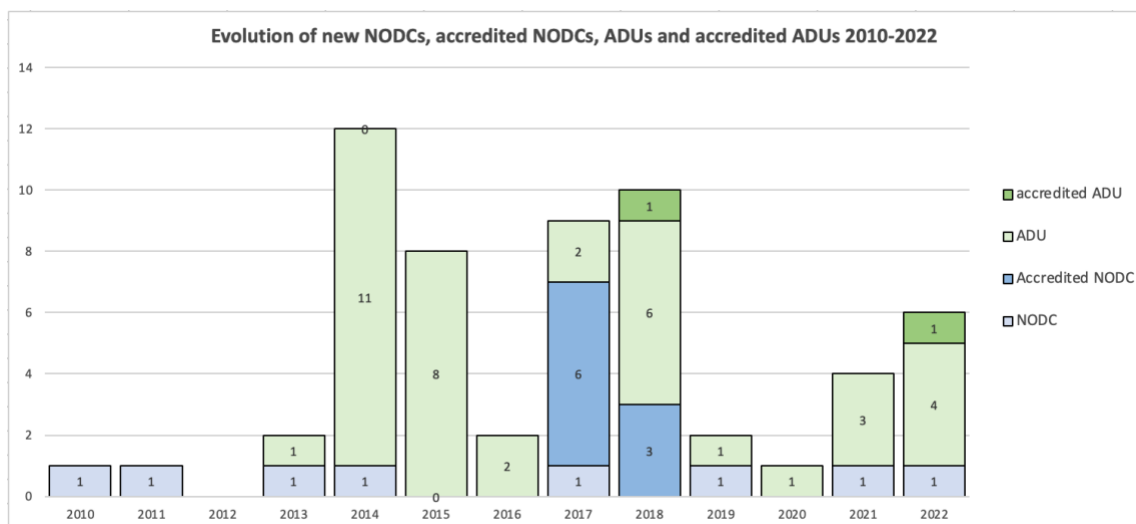
Figure 1: Evolution of new NODCs, accredited NODCs, ADUs and accredited ADUs 2010-2022

33 **The Committee congratulated** the South African Marine Information Management System (South Africa), the Marine Institute (Ireland), and the Norwegian Marine Data Centre (Norway) for their accreditation.

34 **The Committee called** on NODCs and ADUs to apply for accreditation as a "quality seal" demonstrating that the data services provided are of the highest quality standards.

35 **The Committee stressed** the importance of hosting an NODC **and urged** IOC Member States that have not yet established an NODC to do so to ensure their ocean data are shared

globally and that their national ocean scientists have easy access to the global ocean data commons.

36   **The Committee stressed the importance** of hosting an AIU and **urged** marine libraries and information centres that have not yet established an AIU to do so to ensure their ocean information is shared globally and that their national ocean scientists have easy access to the global ocean information commons.

37   **The Committee invited** accredited NODCs, ADUs and AIUs to provide assistance and mentoring services to other NODCs, ADUs and AIUs that wish to apply for accreditation.

38   The Co-Chairs presented the three newly accredited data centres the "IODE Certificate of Accreditation".

3.2.2 Reporting summary of NODCs, ADUs and AIUs

39   This agenda item was introduced by **Mr Greg Reed**, IODE Consultant and Chair of the SG-QMF, referring to Document IOC/IODE-XXVII/3.2.2. (Reporting Summary of IODE NODCs and ADUs). An online version of the report will be made available through https://surveys.iode.org. He noted that due to the small number of responses (11) no report had been prepared for AIUs.

40   He reported that 74 responses were received to the NODC/ADU survey and 11 to the AIU survey. This was slightly better than for the previous (2019-2020) survey.

41   He informed the Committee that the report now compared the results of the 2021-2022 with the 2019-2020 to reveal any significant changes.

42   He then briefly summarized significant outcomes of the survey:

(i)   There seem to be a slightly <u>higher number of data centres that have their own data policy</u> since the previous survey (Q8) while the number of data centres that apply the IOC data policy has not changed;

(ii)   Approximately <u>6% more organizations now have a QMS</u> in place since the previous survey (Q9);

(iii)   The number of <u>data centres that hold ISO9001 certification remains stable around 30%</u> (Q10);

(iv)   We see an <u>increase of approx. 10% intention to apply the IODE QMF</u> and 4.5% who have applied the QMF already (Q11);

(v)   Respondents report an <u>increase of staff</u> (15% more that for the previous survey report an increase) (Q13);

(vi)   The <u>budget of most of the data centres either remained the same or increased</u> (Q15);

(vii)   Participation in IODE projects (Q16) has evolved as follows between 2019-2020 and 2021-2022:

     i. GODAR, after a sharp loss in the previous period is regaining growth;

     ii. GOSUD and GTSPP are growing steadily; (iii) ICAN is stable;

     iii. IQuOD is cause for concern due to the sharp loss of 20% in its partnership;

     iv. Reporting on ODP requires further investigation as the project was halted;

     v. OBIS' growth of data added to the OBIS database is steady, while the loss of OBIS nodes was less than the previous period;

      vi.   OBPS growth continues and is substantial;

     vii.   OIH/ODIS growth continues and is substantial.

   viii.   OceanExpert growth is steady;

     ix.   OTGA growth is steady;

      x.   QMF growth is high and steady.

(viii)   Measurements from vessels for which data centres manage the data see an increase for data related to biology (except for seabed sampling) but a decline for geology/geophysics and physics, while chemistry remains stable (Q18);

(ix)   Measurement from fixed stations/platforms see increases for biology (except for moored buoys), chemistry (except for beach/intertidal zone structures), geology/geophysics but a decline for marine meteorology (except for sub-surface moorings) and physics (Q19);

(x)   Measurements from moving platforms see a decline for chemistry, geology/geophysics (Q20);

(xi)   There is a decline of 6.6% in delayed mode data and an increase of 4.7% in real-time data (Q22);

(xii)   There is an increase in data centres managing GOOS EOVs (out of the 31 EOVs, 23 show an increase and only 5 a decrease) (Q24);

(xiii)   There is a significant decline in the data centres that report a data discovery portal (9%). This requires further investigation (Q25) but we note a substantial increase (15.8%) in portals that are openly accessible (Q26);

(xiv)   A significant number of data centres ended their activities related to quality-controlled delayed-mode data sets, access to real-time data, data atlases, numerical modelling outputs and, to a lesser extent, maps, GIS layers and statistics (Q28);

(xv)   33% less data centres charge for online data access as compared to the previous survey (Q30);

(xvi)   In terms of users, we see an increase in researchers, government policy/decision makers. Private sector has remained stable. There is also a substantial increase in users from the general public. Environmental groups have declined (Q32). There appears to be a decline of regional users but a slight increase in international users (Q33);

(xvii)   We see a 4% increase of submissions to the Silver Spring USA WDC (Q36);

(xviii)   More than 19% of the respondents reported spending 0 days on IODE matters (5% increase compared to the previous survey). The majority (47%) spend between 1 and 10 days on IODE matters. A shift is noticeable towards less time spent on IODE matters (Q41);

(xix)   The majority of respondents was not able to answer this question indicating that the data centre probably does not have control of this matter (Q42);

(xx)   Regarding the provision of visiting experts/secondments to the IOC Project Office for IODE we see a 5% increase in "No". In cases of a positive response we see a decline in duration (Q43);

(xxi)   10% less respondents are planning activities for the UN Decade of Ocean Science for Sustainable Development (Q46).

43   The Committee was invited to review the results of the 2021-2022 survey (and its comparison to the 2019-2020 survey).

44   **The Committee**, while welcoming the increase in resources of the data centres, **noted with concern** the decrease in data centres that report a data discovery portal.

45   **The Committee instructed** the Secretariat to further investigate this matter and **invited** data centres to establish data discovery portals.

46   **The Committee invited** IODE NODCs, ADUs and AIUs to report (as part of the reporting in preparation for IODE Committee meetings) on projects, programmes and other initiatives in which they are involved and relevant to IODE.

3.2.3   Review of NODC health status within the IODE network

47   This agenda item was introduced by **Dr Sergey Belov,** IODE Co-Chair. He recalled that IODE-XXVI had decided to extend the Inter-sessional working group on the review of NODC health status within the IODE network and instructed it to provide (i) a revision of IOC Manuals and Guides No. 5 (Guide for Establishing a National Oceanographic Data Centre); (ii) a revision of IOC Manuals and Guides No. 67 (IODE Quality Management Framework for National Oceanographic Data Centres and Associate Data Units (Revised edition)); and (iii) finalise IODE data centre health check procedures, for submission to the IODE Management Group for its January 2022 meeting.

48   Dr Belov reported that a revised version of IOC Manuals and Guides No. 5 (Guide for Establishing an IODE National Oceanographic Data Centre, IODE Associate Data Unit or IODE Associate Information Unit (3rd revised edition)) has been prepared and is published on https://oceanexpert.org/document/30863

49   Dr Belov reported that the revision of IOC Manuals and Guides No. 67 (IODE Quality Management Framework for National Oceanographic Data Centres and Associate Data Units (Revised edition)) has been completed and published in 2019 on https://oceanexpert.org/document/12661

50   Dr Belov reported that a revision of IOC Manuals and Guides No. 73 (Guidelines for a Data Management Plan) has been completed and published in 2022 on https://oceanexpert.org/document/31418.

51   Dr Belov reported that the IODE data centre health check procedures had not been finalized as planned and were not submitted to the IODE Management Group held in March 2022.

52   Dr Belov further noted that for a number of IODE NODCs and ADUs no response had been received to requests to update contact information (e.g. through IOC Circular Letter 2892 of 2 June 2022 and follow-up emails of 18 August 2022). In some cases, no contact had been made for over four years. He invited the Committee to consider actions that should be taken in such cases.

53   Reference was made to the OBIS node health check (https://manual.obis.org/nodes.html#obis-node-health-status-check-and-transition-strategy) which outlines a procedure for regular health checks and remedial measures.

54   **The Committee noted** the slow progress on the IODE data centre health check procedures, although a short progress report has been made available very recently, **decided** to extend the "Inter-sessional working group on the review of NODC health status within the IODE network" for another inter-sessional period and **instructed** the working group to (i) provide a status report on the procedures to the IODE Management Group (2024); and (ii) finalize the procedures for submission to the 28th Session of the IODE Committee (2025).

55   **The Committee instructed** the IODE Management Group to take into account the procedures used by the SG-OBIS as a possible model in their deliberations.

56   **The Committee invited** experts to join the working group and **welcomed** Sissy Iona (Greece), Sheldon Carter (OBIS ADU ISA, Jamaica), Lotta Fyrberg (Sweden), Lennert Tyberghein (OBIS SG), Yang Jinkun (China) as members of the group.

57   **The Committee further decided** that, once a year, the IODE Secretariat should send out an IOC Circular Letter to all IOC Member States, inviting them to designate or update information on IODE national coordinators (data management and information management) and update the list on the IODE web site.

58   **The Committee noted** the revision of IOC Manuals and Guides No. 5 (Guide for Establishing an IODE National Oceanographic Data Centre, IODE Associate Data Unit or IODE Associate Information Unit) and **thanked** contributors for their work.

59   **The Committee noted** the revision of IOC Manuals and Guides No. 67 (IODE Quality Management Framework for National Oceanographic Data Centres and Associate Data Units (Revised edition)) and **thanked** contributors for their work.

60   **The Committee noted** the revision of IOC Manuals and Guides No. 73 (Guidelines for a Data Management Plan) and **thanked** contributors for their work.

3.2.4   Possible actions to further expand the network

61   This agenda item was introduced by **Mr Greg Reed,** IODE Consultant and Chair of the SG-QMF. He started by recalling the instruction given by IODE-XXVI: "*The Committee instructed the Secretariat to contact the IOC focal points of IOC Member States that have not established NODC or ADU and invite them to consider establishing such as facility, and to offer to meet with the contact to discuss in more detail. Expanding the network requires an understanding the challenges interested member states are facing in terms of resourcing, national buy-in, etc. If the representative is interested but not in a position to participate through full NODCs/ADUs, IODE should work with the member state in an outreach capacity, working with the member state to seek opportunities to participate in a sustainable way, possibly through partnership with other regions, etc. It is strongly recommended that the NODC and ADU Community Surveys be used as a supporting resource in this work*".

62   He then provided an overview of the current status (15 December 2022) of the IODE network (also reflected in https://www.iode.org/datacentres :

- Total number of IOC Member States with one or more NODC or ADU: 68
- Total number of data centres (NODC or ADU) in the IODE network: 98 (of which 18 in Africa, 11 in Latin America and 10 in the WESTPAC region)
- Total number of NODCs: 58 (10 inactive or closed)
- Total number of ADUs: 40
- Total number of AIUs: 6
- Total number of accredited NODCs: 9
- Total number of accredited ADUs: 2

63   He informed the Committee that an email campaign had been started in May 2021 whereby an email was sent to 78 IOC Member States that had not established an NODC or ADU. Out of these 39 Member States received the email but did not respond; for 14 Member States no valid email address was available for the IOC focal point. Contact was established with 21 Member States: Angola, Barbados, Belize, Cabo Verde, Congo (DR), Cook Islands, Costa Rica, Dominican Republic, Estonia, Finland, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Poland, Portugal, Trinidad & Tobago, Venezuela and Vietnam.

64   The number of IODE national coordinators for data management has now increased (3 August 2022) to 89 for 86 Member States. The number of IODE national coordinators for marine information management is 40 for 38 Member States.

65   On 2 June 2022 IOC Circular Letter No. 2892 (Nomination and/or updating of details on IODE National Coordinators for Oceanographic Data Management and IODE National Coordinators for Marine Information Management) was issued with a deadline for response on 1 July 2022. To date (19 October 2022) 45 Member States responded.

66   The Committee was invited to consider the slow progress in recruiting new members of the IODE community of data and information centres.

67   **The Committee noted with regret** the continuing small number of IODE Associated Information Units (AIUs) and **requested** a concerted recruitment effort be made to increase the number before IODE-XXVIII in close collaboration with ASFA and IAMSLIC.

68   **The Committee invited** information centres, marine libraries and librarians as well as professional organizations such as IAMSLIC and ASFA to collaborate with IODE activities directly.

69   **The Committee, noting** the slow and limited establishment of NODCs by Member States, **recommended** that a statement inviting Member States to actively establish NODCs should be included in the Assembly draft decision on IODE.

70   **The Committee welcomed** the steady growth in the number of IODE ADUs and **invited** organizations that manage oceanographic data currently not involved in IODE, to consider joining IODE as ADUs.

3.3   PROGRESS REPORTS OF IODE PROJECTS

3.3.1 Global Projects

71   This agenda item was introduced by **Mr Greg Reed,** IODE Consultant and Chair of the SG-QMF. He referred to Document IOC/IODE-XXVII/3.3.1 (IODE Project Reporting Review). He informed the Committee that, due to the very limited time available it would not be possible to provide oral presentations on the progress reports of all projects. Instead, reporting has been requested from all projects and included in the mentioned document.

72   Mr Reed explained that all IODE projects must meet the specified evaluation criteria and are evaluated by the IODE-MG Executive annually, based on the reports provided by each project. The criteria for evaluation of ongoing project performance are described in IOC Manuals and Guides No. 81rev2 (Procedures for Proposing and Evaluating IODE Projects and Activities (2ndRevised edition)). Ongoing projects that do not receive a positive evaluation (<60% of maximum score) will be notified of what actions need to be taken to improve performance and given an appropriate time frame for improvement.

73   Reporting is included in the above-mentioned document on the following global projects:

1. AquaDocs
2. GODAR/WOD
3. GOSUD
4. GTSPP
5. ICAN
6. IQuOD

7. ODP
8. OBIS
9. OBPS (IODE/GOOS)
10. Ocean InfoHub (including OIH extension project)
11. ODIS (including ODISCat)
12. OceanExpert
13. OceanTeacher Global Academy (including Alumni project)
14. PacMAN
15. IODE QMF

74 **Mr Taco De Bruin,** IODE Co-Chair invited Chairs of project steering groups to briefly address the Committee to address specific issues or concerns related to their projects that require consideration by the Committee, a decision or formal recommendation.

3.3.1.1. AquaDocs

75 **Ms Jennifer Walton**, SG-AquaDocs Co-Chair informed the Committee that AquaDocs is the joint open access repository of the UNESCO/IOC International Oceanographic Data and Information Exchange (IODE) and the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) with support from the FAO Aquatic Sciences and Fisheries Abstracts (ASFA).

76 AquaDocs contains more than 36,000 publications covering the natural marine, coastal, estuarine/brackish and freshwater environments, and was created by merging content from two repositories (OceanDocs and Aquatic Commons). AquaDocs serves as a repository for more than 130 organizations and projects to make their aquatic and marine science information Findable, Accessible, Interoperable, Reusable (FAIR). Since its launch on August 17, 2021, the repository has grown by almost 1000 publications.

77 IODE and IAMSLIC jointly manage and operate the AquaDocs project. AquaDocs includes IOC, UNESCO and IODE publications, providing access to their document series, national and project reports, meeting reports, etc. AquaDocs offers persistent identifiers called Handles (similar to DOIs) which simplifies citing and linking to documents and ensures linking access if the IODE website or OceanExpert are re-developed. AquaDocs can serve as a repository for other IODE projects and also other ocean projects and organizations. As a trusted repository for ocean information, AquaDocs may serve as the repository for the information products and documents produced by the over 200 Decade Projects, creating a central location for the reports and documents created by the projects and increasing their discoverability. Recent examples include the Partnership for Observation of the Global Ocean (POGO) and Scientific Committee on Oceanic Research (SCOR). In addition, other emerging data products (e.g. Harmful Algal Information System) could link to specific documents already available in AquaDocs.

78 AquaDocs is a target resource in the ODIS/OIH ecosystem which increases discoverability of the AquaDocs collection including IODE documents. Next year the Steering Group will explore the possibility of linking to OceanExpert records, further contributing to the ODIS/OIH data ecosystem.

79 The AquaDocs Steering Group (SG) conducted a survey from 17 January to 3 February, 2023 to hear from stakeholders about their experiences with AquaDocs, and to solicit ideas to improve the repository and user support. 91% of respondents expressed satisfaction with their overall experience of AquaDocs, and with the support they received (e.g., guides, training, one-on-one support). The top reason for using AquaDocs to find publications is that it's a

dedicated aquatic and marine science open access full text repository. The top reasons to submit publications to AquaDocs are that it's a trusted repository hosted by recognized aquatic and marine science organizations, and it serves as a repository for organizations to make their publications openly accessible. Respondents also offered suggestions for improvements. There are two known technical issues that the SG continues to work on, namely that the embedded ASFA thesaurus is slow to load, and access to usage statistics can be problematic. There is a desire for faster editorial review in some regions which the SG will address by recruiting more editors to handle the volume of submissions. The respondents called for an increase in efforts to promote AquaDocs to potential users and submitters, and to recruit content from specific regions. The SG will continue to do outreach through IAMSLIC, IODE and ASFA channels to reach new users and grow the repository.

80   Ms Walton noted that discussions were being held and concerns raised regarding the future hosting and maintenance of AquaDocs, taking into account cost and availability of funds.

81   **The Committee expressed its appreciation** for the progress made by AquaDocs and **decided** to continue this project.

82   **The Committee instructed** all IODE projects and **invited** Member States to contribute research and informational documents to AquaDocs.

83   **The Committee invited** institutions and organizations, with insufficient capacity to host their own repository, to use AquaDocs.

84   **The Committee recommended** that AquaDocs serve as the repository for reports and documents generated by the Decade Actions.

85   FAO, given the role of IOC/IODE in the Ocean Decade, expressed support for the proposed action item for Aquadocs to be the repository for documents of the Ocean Science decade action that support the SDGs. As part of its adoption of a new business model, which includes the launch of OpenASFA, ASFA thanked AquaDocs for the successfully completed joint activities during 2021 which included: (i) knowledge management training provided to country librarians from IAMSLIC and ASFA communities ; (ii) harvesting of metadata from AquaDocs to OpenASFA, hence to encourage the ASFA providers to use Aquadocs when they can submit full text together with abstracts. ASFA will support IOC and Aquadocs on this newly proposed action item and invites IOC and IAMSLIC for any follow-up action required to make this objective a success, also building on completed joint activities between ASFA and AquaDocs.

3.3.1.2.   GODAR/WOD

86   **Dr Hernan Garcia**, GODAR Project Leader, reported that the IODE Global Oceanographic Data Archaeology and Rescue (GODAR) project is tasked to identify historic ocean profile data which are not readily available publicly and may be in danger of disappearing from the public record, and adding it to the World Ocean Database (WOD) for preservation and open public access. WOD is an IODE project. Historic in this context means any oceanographic data taken more than five years from the present date. The GODAR project added historic oceanographic profile casts to the WOD over the last two years. GODAR expects to continue and expand communications with oceanographic data centres worldwide to increase data access including the World Data Service for Oceanography. IODE is urged to continue to facilitate this communication and continue to remind member states of the great need to share historic data in danger of obsolescence to the WOD for sustained open availability. GODAR will continue to devote resources to this digitization effort and to work closely with atmospheric

and marine meteorological data rescue efforts. GODAR plans include working through the IODE Secretariat to assess and prioritize global ocean science-based data digitization needs.

87 **Dr Hernan Garcia,** representing Mr Tim Boyer, WOD, reported that data with global geographic distribution were added since the last IODE meeting. Major sources of recent data in WOD continue to be the Global Temperature and Salinity Profile Project (GTSPP, 89,248 casts), the Argo program (171.890 casts), and the Pacific Marine Environmental Laboratory's tropical moored buoy program (NOAA/PMEL, 18,565 casts). He noted that GTSPP casts in WOD are far less than the number of oceanographic stations new to GTSPP for 2022, as the majority of GTSPP stations are single level coastal stations, and not ocean profile casts. Major sources which are updated quarterly in WOD include the CLIVAR and Carbon Hydrographic Data Office. One major source from years past which has not been available in 2022 is the International Council for the Exploration of the Seas (ICES). The flow of data to the WOD was impacted by the global pandemic which hindered deployment of instruments from research ships, maintenance of moored buoys, and replenishment of automated observing arrays. The European effort to develop of a federated European FAIR and Open Research Ecosystem for oceans, seas, coastal and inland waters (namely Blue-Cloud and Blue-Cloud 2026) has expressed interest in mobilising and making available validated and harmonised in-situ data from major European data resources as SeaDataNet, EMODnet and Copernicus to WOD The *World Ocean Database Programme (WODP): Openly discoverable, accessible, adaptable, and comprehensive digital global profile oceanographic data of known quality*, is an approved action of the Ocean Decade.

88 Dr Garcia further informed the Committee on ongoing discussions between WOD and the Ocean InfoHub project on granular oceanographic cast level discovery and access of the WOD through OIH.

89 **The Committee welcomed** the discussions between WOD and OIH aimed at integrating WOD in the ODIS ecosystem.

90 **The Committee** noted with appreciation the progress made by WOD and GODAR and **decided** that these projects should be continued.

3.3.1.3. GOSUD

91 **Mr Ludovic Drouineau**, GOSUD Project Leader, reported the main objective of GOSUD (Global Ocean Surface Underway Data Project) is to collect, process, archive and disseminate in real time and delayed mode, sea surface salinity and other variables collected underway, by research and opportunity ships.

92 The Ocean Observations Panel for Climate, OOPC, and its predecessors examined the usefulness of surface salinity data in the context of climate change detection. They state that "At high latitude, sea surface salinity is known to be critical for decadal and longer time scale variations associated with deep ocean overturning and the hydrological cycle. In the tropics, and in particular in the western Pacific, and Indonesian Seas, and in upwelling zones salinity is also believed to be important." They quote the benchmark sampling strategy to be one sample per 200 km square every 10 days and with an accuracy of 0.1 PSU. They also state that the tropical western Pacific and Indian Oceans and high latitudes should receive the highest priority. CLIVAR (Climate and Ocean: Variability, Predictability and Change) planners have stated what they think are the attributes of a successful data and information management system. In the Proceedings of the International CLIVAR Conference held in Paris in 1998, one attendee states that the following points are likely to be prominent: (i) Swift

assembly and distribution of data, ready availability and free access; (ii) Data sets and products are comprehensive in terms of the variables; (iii) Encourage exploration of historical and paleo data sets; (iv) Encourage processing methods that eliminate or minimize the production of spurious signals; (v) Ensure that adequate and timely data are available for the initialization and validation of climate forecast systems; (vi) Maximize the utility of the sustained observing system for various process or intensive studies; and (vii) Work with GOOS/GCOS, World Weather Watch and Global Atmosphere Watch in development and implementation of the strategy.

93   Mr Drouineau recalled that GOSUD was established as an IODE Project at IODE-XVI through Recommendation IODE-XVI/10 (2000) as the "Underway Sea Surface Salinity Data Archiving Project". In addition, the JCOMM-1 meeting supported such a project urging that integration with other data collected at the same time be properly considered.

94   The IODE Steering Group, during is 2022 meeting, recommended to revise the Terms of Reference of GOSUD and change the name to "Underway Sea Surface Salinity Data Archiving Project (GOSUD)".

95   **The Committee welcomed** the revitalization of GOSUD and the linkage with the OOPC.

96   **The Committee expressed its appreciation** for the progress made by GOSUD and **decided** to continue this project.

97   **The Committee expressed its great appreciation** to Dr Loic Petit de la Villéon for his active leadership of GOSUD and to the past members of the SG-GOSUD for their contribution to GOSUD.

98   **The Committee adopted** Decision IODE-XXVII.3.3.1.3

3.3.1.4.   GTSPP

99   **Mr Taco De Bruin** explained that **Mr Christopher Paver**, GTSPP (Global Temperature-Salinity Profile Program) Project Leader could not attend. Mr De Bruin reported that the mission of GTSPP is to acquire, synthesize, and generate data products for near-real time and delayed mode (i.e. science quality) water temperature and salinity profiles. The main sources of the data are the Global Telecommunications System (GTS) mostly for near real time data and directly from contributing SOT SOOP regional Data Assembly Centres (DACs) for delayed mode data. US NOAA/NCEI continues to maintain the synthesized profile database and generate operational Real Time and Best Copy data products. Canada DFO continues to acquire data from the GTS and process for submission to US NOAA/NCEI. The regional DACs (i.e. US NOAA/AOML, University of California San Diego - SCRIPPS, Australia CSIRO) continue to submit delayed mode data to US NOAA/NCEI.

100   Due to staffing and IT issues within some of the contributing organizations over the past couple of years, gaps in data acquisition and processing have become an issue. For example, data being made available over the GTS in the relatively newer GTS file format BUFR, are not being acquired, save the near-real time Argo data. Canada DFO is suffering from both staff shortages and IT issues that have precluded them from developing the software needed to regularly acquire data in the BUFR format. There is currently no backup facility to acquire this data. US NOAA/NCEI has reduced staffing in support of the program. As a result, data submitted by the DACs are not being included into the synthesized database or in the resulting operational products, however they are being included into the World Ocean Database and subsequent products.

101 <mark>**The Committee instructed** the GTSPP project to engage with the GOOS OCG Open-GTS project to explore the possibility of filling in the missing data gaps.</mark>

102 <mark>**The Committee expressed its appreciation** for the progress made by GTSPP and **decided** to continue this project.</mark>

3.3.1.5. ICAN

103 **Ms Tanya Haddad** (co-chair of the ICAN Steering Group) reported the International Coastal Atlas Network (ICAN) has had a productive 2021-2022 work period. During this time the project built upon its investments in an improved web platform to reinvigorate its outreach to the worldwide Coastal Atlas community with a very productive programme. This included high participation from steering group members throughout the biennium, and a very successful ICAN workshop in September of 2021, and summer scholar programme in 2022. The ICAN 9 workshop involved over 35 invited speakers over the course of 3 days, was attended by over 150 participants from over 40 countries, and live streamed in 4 languages. Each day focused on a specific topic relevant to the overarching theme: Local to Global - Benefits of Coastal Web Atlas Sharing & Connectivity where day 1 was dedicated to introduce new and established resources and connect with the wider coastal web atlas (CWA) community, day 2 explored how our CWA's can contribute to and link in with the UN Decade of Ocean Sciences and the Sustainability Goals and day 3 explored how Atlases can share their content more effectively and make connections to the OceanInfoHub project.

104 In 2022, ICAN built upon the success of the 2021 workshop by hosting two Sea Grant Summer Scholars to continue engagement of ICAN members around the globe. These scholars conducted research and updates to the ICAN online directory of coastal atlas projects, conducted interviews with many Atlas owners and developed a series of articles for the ICAN website (35+ articles and 95+ directory entries) and newsletter to improve the sharing of information between Atlas owners around the world. In addition, the ICAN Tech team members participated in a variety of Ocean InfoHub activities and contributed to various OIH outreach efforts, particularly within the African Coastal and Marine Atlas community, and remain committed to assisting Atlas owners with making interoperable connections to the global OIH effort. ICAN Steering Group members remain committed to supporting this effort into the coming 2023-2024 biennium.

105 <mark>**The Committee welcomed** the discussions between ICAN and OIH aimed at increasing participation of ICAN members in the ODIS ecosystem.</mark>

106 <mark>**The Committee expressed its appreciation** for the progress made by ICAN and **decided** to continue this project.</mark>

3.3.1.6. IQuOD

107 **Dr Udaya Bhaskar,** on behalf of the IQuOD (International Quality Controlled Ocean Database) Project Leader, reported that through the coordination of resources and expertise into a single best practice international community effort, the IQuOD project aims to produce, freely distribute and curate the highest quality, most complete and consistent global ocean subsurface temperature profile repository for Earth system, climate and ocean studies, with (intelligent) metadata and an uncertainty estimate for every observation. Major recent activities included: (i) Publication of automatic quality control work (https://www.frontiersin.org/articles/10.3389/fmars.2022.1075510/full) ; (ii) Continued implementation of the expert quality control system on AWS infrastructure; (iii) Spin up of a

task team on duplicate detection. In addition to being an IODE project, IQuOD is currently a working group of SCOR (https://scor-int.org/group/148/). IQuOD's SCOR working group activities are expected to finish by the end of 2023. He further informed the Committee that a joint meeting was planned between IQuOD and IUGG (International Union of Geodesy and Geophysics), July 2023 in Potsdam, Germany.

108 ==The Committee noted with appreciation the progress made by IQuOD and **decided** to continue this project.==

109 ==The Committee invited IQuOD to explore cooperation with other IODE projects such as ODIS/OIH, OTGA and others.==

3.3.1.7. ODP (Ocean Data Portal)

110 Dr Sergey Belov gave a brief overview of achievements and challenges during the inter-sessional period. Ocean Data Portal has been established in 2007 through Recommendation IODE-XIX.4 to facilitate and promote the exchange and dissemination marine data and services, provide seamless access to collections and inventories of marine data from the NODCs in the IODE network and allowing the discovery, evaluation (through visualisation and metadata review) and access to data via web services. During the project a stack of technologies for creating and maintaining metadata, intelligent connection of data from databases and file sources, processing, visualization and their provision in the mode of web-services was developed. There was a series of training courses and installations in the ODIN regions (Africa, Asia, Latin America). However, with the development of the ODIS concept, the OceanInfoHub brokers, and, what is also important, the expiration of the memorandum between the IOC-UNESCO and Roshydromet on the Partnership Center for ODP, it was decided to prepare a new memorandum, which will be discussed separately in agenda item 6.3.Between 2021 to 2023 the work of the project consisted in ensuring the stable operation of the project network nodes, developing technical solutions for the evolution of the ODP to provide a contribution to ODIS, Ocean InfoHub and ODISCat. This work is currently ongoing.

111 Due to the rapid growth of cloud technologies, as well as new approaches of managing metadata and data, the existing technology stack of the project requires significant modernization. Thus, it seems logical to close the project in its current form and prepare a new structural element for IODE, transferring to the new technology tools and services still actual and required, and improving and/or implementing new facets for the IODE digital ecosystem.

112 The representative of the Russian Federation informed the Committee that the Russian Federation supports the closure of the Ocean Data Portal project, initiated in 2007 by the Russian Federation and which has increased the capacity for data exchange of a number of UNESCO IOC member countries and announced their readiness to prepare an application for a new IODE project, the successor of the Ocean Data Portal project, as an element of ODIS and for the benefit of the Decade of Ocean Sciences, after the procedures for submitting applications for new programme components, activities and projects will be developed and approved by the Twenty-eighth Session of the IOC Committee on International Oceanographic Data and Information Exchange.

113 ==The Committee, taking into account the evolution towards ODIS, **decided** to close the Ocean Data Portal project. It **expressed its gratitude** to Dr Belov and his team for their work on ODP since its establishment in 2007 through Recommendation IODE-XIX.4, Reference was made also to agenda item 6.3.==

3.3.1.8. OBIS

114 **Dr Lennert Tyberghein,** representing **Dr Martha Vides** (co-chair of SG-OBIS) reported that since the previous IODE Committee session (April 2021) OBIS published 37.64 million new taxon occurrence records from 16,600 marine species previously not in OBIS (Ocean Biodiversity Information System) integrated from 796 new datasets, and 17 million new measurements or facts. OBIS now has a total of 108 million records of 170,000 marine species, and 185 million measurements or facts, integrated from 4,665 datasets. This is the same number of records OBIS normally published in a decade. A large part of this (exponential) growth can be assigned to the new capability at OBIS to deal with DNA derived data, which accounts for almost 22 million records. We also saw a duplication of the number of sessions/visitors to our website since Oct/Nov 2021 and 85% more papers citing OBIS are published compared to previous years.

115 The OBIS Secretariat grew from 3 to 5 staff members (albeit 4 of them on a temporary basis), which means we now have more capacity to (i) support the various OBIS task teams, (ii) develop more training resources, (iii) actively support local science capacity building with two eDNA projects (one in Pacific Islands to monitor marine invasive species and a global one in UNESCO's World Heritage marine sites to monitor biodiversity and vulnerability to climate change) and (iv) support the Global Ocean Observing System by providing the GOOS BioEco portal and helpdesk to monitor the status of the biological ocean observing system. These extrabudgetary projects also provided necessary resources for further technological developments of the global data system, such as a bioinformatics pipeline to manage species occurrences based on DNA sequences. The increase in capacity also attracted new funding and we are therefore pleased to report that OBIS managed to obtain two new grants as part of two new large European Horizon projects: MARine COastal BiOdiversity Long-term Observations (MARCO-BOLO) and Marine Protected Areas Europe (MPA Europe). One new OBIS node was added to the network, the International Seabed Authority joined OBIS in June 2021. Unfortunately, CRODT/OBIS Senegal has not been able to reactivate its activities (see project report) and the OBIS steering group requests the IODE Committee to remove OBIS Senegal from the list of OBIS nodes. If OBIS Senegal has the capacity to become active again, they are welcome to re-join.

116 On 17-20 May 2022, 44 participants from 23 countries representing 26 OBIS nodes participated in the 10th session of the IODE Steering Group for OBIS (SG-OBIS). The session was held online. The OBIS steering group adopted the 2022 work plan. Among many other things, OBIS will submit a Ocean Decade project proposal for which a writing workshop took place in October 2022 at the new premises in Ostend. OBIS will develop recommendations for historical data and data from archaeological and paleontological sources through a new OBIS Historical Data Project Team (HDPT). GBIF (Global Biodiversity Information Facility) is currently exploring a new data model for a unified common model capable of supporting expanded data-publishing capabilities. Therefore, a new OBIS Grand Unified Data Model Project Team (GUMPT) has been formed to provide direction and guidance into how the model can best represent OBIS community data and an opportunity for OBIS to prepare for this new direction. The OBIS steering group stressed the importance of being recognized as the marine network in GBIF as well as having all marine biodiversity data published in both GBIF and OBIS. It agreed on a single publishing workflow, which should lead to a better synchronization of marine data in both GBIF and OBIS. The OBIS steering group regretted the severe budget cuts to our parent programme IODE, which also impacts the ability to execute our work and to ensure the network stays connected. For OBIS the demand for biodiversity data to support international processes has never been greater and never been more pertinent, such as the

need to provide data for indicators adopted under the new CBD (Convention on Biological Diversity) Global Biodiversity Framework, the future activities under the new BBNJ ((Marine Biodiversity of Areas Beyond National Jurisdiction) treaty as well as assessments under IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services), and World Ocean Assessment and the requests to support the other IOC programmes such as HAB, and GOOS. OBIS therefore urged Member States and donors to provide financial support to OBIS including the OBIS nodes. Without a dedicated training officer and a data manager, the OBIS Secretariat is currently unable to support the network and maintain the system.

117 **The Committee congratulated** the network of OBIS nodes and the Secretariat for the important achievements and **reiterated** its past requests to the IOC Executive Secretary to create a regular programme position for the OBIS data manager.

118 **The Committee expressed its appreciation** for the progress made by OBIS and **decided** to continue this project.

119 **The Committee noted** the review of the health status of OBIS nodes and **agreed with regret** with the proposal from the SG-OBIS to remove inactive OBIS nodes from the network and invited them to re-join when they have the necessary capacity.

3.3.1.9.   OBPS (IODE/GOOS)

120 **Prof René Garello** (OBPS Co-Chair) reported that OBPS (IODE/GOOS Ocean Best Practices System) continues to expand its support across disciplines as it moves further in its strategy of providing visibility and discovery of known methods, facilitating transparency of information and improved global level interoperability. Understanding the flow from data to information to knowledge leading to decision-making will make ocean management more effective. But there are challenges. Each discipline has its own vocabulary and customs. There are also challenges in adopting best practices globally due to the differences in infrastructure, personnel capacity and national and regional issues. OBPS has a Task Team to adapt best practices to regions of limited infrastructure, to further global interoperability. The OBPS Ocean Decade Programme, OceanPractices (OP), is expanding under the new leadership of Rebecca Zitoun and Aileen Tan and will be the focal point for further globalizing methods and collaborating with the many other Ocean Decade programmes. The OBPS has also instituted an "Ambassador programme" with Early Career Ocean Professionals from five continents.

121 During 2022, OBPS continued its contribution to international projects: European Union H2020 Programme Projects, EuroSea, and JERICO-S3, both of which come to an end 2023/early 2024, and with support from IEEE France, CAPARDUS (Capacity-building in Arctic standardisation development) and ILIAD (a Digital Twin of the Ocean project). Continuing collaborations with other proposed projects are essential and encouraged. OBPS supported workshops that included aquaculture, fisheries, modelling, policy as well as observation sciences and data management. The OBPS 2022 Workshop VI (1152 registrations, 600 active global participants), included a broad range of 19 Theme Sessions over the two-week workshop period, expanding OBPS global reach further into ocean value chain communities. However, the OBPS Steering Group is concerned that impetus will be curtailed by the much-regretted severe budget cuts to IODE, which will impact the OBPS ability to progress its work and to take forward user recommendations. In this regard, Prof Garello informed the Committee of the OBPS Steering Group's decision to investigate the feasibility of creating an OBPS/OP AISBL (Association International Sans But Lucratif).. The AISBL can provide a mechanism for receiving grants from governments and other organizations. Typically, the

advanced development of the OBPS repository and other community supporting activities are done through such grants, The AISBL will not replace OBPS as an IOC project but will support OBPS' sustainability and development.

122   *The year 2022 has seen the addition of seven new Steering Group Members bringing a diverse heritage to OBPS work of propagating best practices. In addition, the new Co-Chairs, George Petihakis and René Garello, bring extensive management experience and understanding of best practices on ocean observation, data and information and applications. They take over the co-chair lead from Johannes Karstensen and Jay Pearlman who have guided the growth of OBPS as an IOC project under the sponsorship of IODE and GOOS.*

123   **The Committee expressed its appreciation** for the progress made by OBPS and **decided** to continue this project.

124   **The Committee urged** the IODE community to further document their methodologies and best practices and share them in the Ocean Best Practices System.

3.3.1.10. Ocean InfoHub (including OIH extension project)

125   **Ms Lucy Scott**, OIH Project Manager on behalf of Mr Harrison Ong'anda, SG-OIH Chair, reported the Ocean InfoHub Project is a project, funded by the Government of Flanders (Kingdom of Belgium), that will support the initial development of the Ocean Data and Information System (ODIS) architecture, as well as develop communities of practice (information systems and their end users) in three pilot regions: Africa, the Latin America and Caribbean region and the Pacific Island Developing states. The three regions have developed considerably over the past year, with new partners, and will continue to expand and evolve, feeding end-user needs into the ODIS-architecture development process. With additional co-funding from NORAD during 2022, three more nodes are being supported, in partnership with National Oceanographic Data Centres in Africa and Asia. A pilot portal will also be established for Areas Beyond National Jurisdiction. OIH has successfully implemented global and regional search and discovery hubs as a demonstration of this system (https://search.oceaninfohub.org/) and these will be further developed over the duration of the project, to improve and refine services offered. The Ocean InfoHub Project provides an opportunity for partners and users to contribute to and access the Ocean Decade global data ecosystem while also offering capacity development opportunities to all to participate equitably in the Ocean Decade data ecosystem.

126   Brazil expressed interest in joining the Ocean InfoHub project.

127   **The Committee expressed its appreciation** for the progress made by the Ocean InfoHub Project (OIH) and **decided** to continue this project.

128   **The Committee called on** Member States to participate in the Ocean InfoHub Project (OIH) to increase the visibility of their data holdings to the world, and to enable improved and more efficient access to global Ocean data.

3.3.1.11. ODIS (including ODISCat)

129   **Ms Lucy Scott,** OIH Project Manager, on behalf of the SG-ODIS, explained that the Ocean InfoHub Project has supported the initial development of the Ocean Data and Information System (ODIS), which provides the interoperability layer and supporting technology 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.

As such, ODIS is not a new portal or centralised system, but provides a collaborative solution to interlink distributed systems for common goals. Together with global project partners and partners in three pilot regions, a process of co-design has enabled a number of global and regional nodes to test the proof of concept for the ODIS.

130 An expert technical working group has been convened, now with over 120 technical experts from partner projects and pilot regions, with technical working platforms on Slack (over 4100 posts) and Github. The global ODIS-architecture has been established, and proof-of-concept achieved with the indexing and sharing of over 500,000 content items from multiple sources. The documentation for the ODIS-architecture is openly available online https://book.oceaninfohub.org/index.html. 57 Pilot partner organisations (working spreadsheet available here) are working with the project to demonstrate proof-of-concept of the ODIS architecture, and 18 of these are now ODIS-architecture compliant and can be discovered through the ODIS network.

131 The ODIS Catalogue of Sources (ODISCat) (https://catalogue.odis.org) is a closely related and linked initiative, which is an annotated catalogue of online resources serving ocean-related data and information products, currently containing over 3080 records.

132 Ms Scott reported that there were no special issues with the projects. Reference was made to agenda item 6.5 for more information on ODIS.

133 **The Committee expressed its appreciation** for the progress made by ODIS and ODISCat and **decided** to continue these projects.

3.3.1.12. OceanExpert

134 **Ms Sofie de Baenst**, OceanExpert Project Manager, explained that OceanExpert continues to be used by many IOC programmes and partners. The OE team (2 people working 20-25% of their staff time – in kind) are working on improving the database and user interface responding to evolving security requirements as well as user feedback, taking care of quality control, handling requests and updates by the end-users (the number of experts keeps on growing in the directory). More IOC websites are using OceanExpert content (people, organizations, events, documents) through the single sign-on system. In 2023 some IOC websites will be updated, where the API connection will need to be reintegrated and tested. The registration process of new users is rewritten and is currently developed and tested on the test website of OceanExpert. Once final, this will be updated to the live OceanExpert website.

135 **The Committee expressed its appreciation** for the progress made by OceanExpert and **decided** to continue this project.

3.3.1.13. OceanTeacher Global Academy (OTGA)

136 **Mr Greg Reed**, IODE Consultant and OTGA Project Manager, informed the Committee that this topic will be discussed under agenda item 4.1.1.

3.3.1.14. PacMAN

137 **Mr Ward Appeltans**, PacMAN Project Manager, reported that the PacMAN project (Pacific Islands Marine Bioinvasions Alert Network), funded by the Government of Flanders (Kingdom of Belgium), is developing an early-detection monitoring system for marine invasive species that will provide early warnings based on environmental DNA analyses. During 2022, PacMAN sampling protocols have been extensively tested in the field, at the Suva Port in Fiji.

Coordinated by the University of South Pacific (USP) and in collaboration with the Biosecurity Authority of Fiji (BAF), the project has gained widespread support from major stakeholders dealing with the marine environment in Fiji. Participants from 7 institutions were trained on the optimized PacMAN protocols in the first ever course on environmental DNA in Fiji. With the easing of COVID restrictions in 2022, the first on-site local stakeholder meeting was also held, where all institutions came together to discuss the progress of the project and the needs for a decision support tool. During the following year the project will operationalize the sampling and molecular analysis, perform the data management and develop and test models required to deliver a decision support tool that will empower the local community to interpret the results from the monitoring program in an efficient manner. A training workshop on the decision support tools and a large outreach event will conclude the project in the first half of 2024. PacMAN is fully funded via the FUST (Flanders-UNESCO Trust Fund for Science) and as such has no budget implications for IODE.

138 **The Committee expressed its appreciation** for the progress made by PacMAN, **decided** to continue this project and **requested** Member States to support the Secretariat and partners involved in PacMAN to further build upon and replicate PacMAN in other states, especially developing states and SIDS that are more vulnerable to the socio-economic impacts of marine invasive species. This will directly support Member States in implementing target 6 of the recently adopted CBD COP15 Kunming-Montreal 2030 targets, which aims to reduce the introduction of new invasive alien species by 50%, and puts emphasis on priority sites, such as islands.

3.3.1.15. IODE QMF

139 See 3.2.1 and 3.4.

140 **The Committee expressed its appreciation** for the progress made by the IODE QMF and **decided** to continue this project.

141 **The Committee noted with** appreciation the progress made by the 15 global projects.

3.3.2 Regional activities

142 Coordinators of the ODIN projects were invited to briefly summarize activities during the past inter-sessional period. No report was received for ODINCINDIO.

3.3.2.1 ODINAFRICA

143 **Dr Sergey Belov** explained that Mr Mika Odido, IOC Coordinator in Africa could not attend. Dr Belov reported on the actions that have been taken to revitalize the Ocean data and Information Network for Africa (ODINAFRICA). This included the organization of an online workshop in March 2022 with stakeholders to deliberate on the revitalization of the network to support the development of an African node for the Ocean InfoHub. The ODINAFRICA Steering Group, established during the workshop developed a Strategic Plan for revitalization of the network, focussing on 3 areas:
(i)   Establishment and advancing the development of a regional 'digital twin' for Africa;
(ii)   Establishment of the ODINAFRICA portal as the African regional node for the Ocean InfoHub (OIH) Project's Ocean Data and Information System (ODIS);
(iii)   Enhancement of capacity development for safe and efficient gathering, quality control, processing, dissemination, and preservation of ocean data generated by national and international agencies.

144 Progress has been made in the development of the ODINAFRICA portal focussing on the six thematic areas for the Ocean InfoHub. The African Coastal and Marine Atlas has been migrated to a new Geonode platform developed with support from ICAN. Linkages have been established with the Seabed2030 project to advance the mapping of the sea floor around Africa.

145 The focus in the coming biennium will be on populating and quality control of the databases that have been developed, as well as capacity development and the generation of data and information products for sustainable management of the ocean and coastal resources and environment.

3.3.2.2 ODINCARSA

146 **Mr Ariel Troisi**, IOC Chair reporting on behalf of ODINCARSA (Ocean Data and Information Network for the Caribbean and South America), reported that the activities implemented, and results achieved during the inter-sessional period are directly associated to Ocean Teacher Global Academy 2 (with its three RTCs and one STC), as well as to Ocean InfoHub and the LAC regional node. In keeping with Decision IODE-XXVI.4.1.2, closer links were established with IOCARIBE. Nevertheless, the region continues suffering from extremely limited financial resources to support activities. The asymmetrical distribution of capacities in terms of human resources and infrastructure reported in previous IODE Committee meetings remains a challenge. Despite the efforts made and the activities carried out during the inter-sessional period, several shortcomings persist. Although the critical importance of proper data and information management and associated capacity development remains unchallenged, the continuation of ODINCARSA-LA under its current form and structure requires revision.

3.3.2.3 ODINWESTPAC

147 **Dr Sun Miao,** on behalf of Dr Shi Suixiang, Project Coordinator of ODINWESTPAC (Ocean Data and Information Network for the Western Pacific) reported on the operation of ODINWESTPAC. The ODINWESTPAC project was established by recommendation IODE-24.4 in 2017. It is operationally run by National Marine Data and Information Service (NMDIS) of China. During 2021-2022, ODINWESTPAC focused on the main areas including resource pooling and integration, thematic products development, and resource sharing, continuously serving the data and products needs in the region. It kept on integrating and collection of ocean data resources in the Western Pacific region and has formed a multi-channel data integration and aggregation mode. A new generation of global high-resolution ice-sea coupled reanalysis products CORA (China Ocean ReAnalysis) v2.0 was developed. The website of ODINWESTPAC was upgraded, and a new thematic module of the "21st Century Maritime Silk Road" was added to provide data and information from oceanographic stations, buoys and forecast along the Maritime Silk Road. Currently, the system has over 1000 registered users, and the total service volume has reached more than 150,000 times.

3.3.2.4 Future of the ODIN Projects

148 Regarding regional activities (ODINs) **Dr Sergey Belov** (IODE Co-Chair) recalled that IODE-XXVI had adopted Decision IODE-XXVI.4.1.2 that decided:

- to continue ODINs as IODE projects,
- to link ODINs more closely to IOC regional subsidiary bodies (IOCARIBE, IOCAFRICA, IOCINDIO, WESTPAC),

- to continue the governance of ODINs fully as IODE projects in cases where no IOC subsidiary body exists,
- that ODINs are encouraged to collaborate with and strengthen the regional implementation of IODE projects (e.g., OBIS, OTGA, OIH),
- to establish an inter-ODIN forum to provide closer connections between the ODINs and with other IOC global programmes and facilitate the sharing of best practices,

IODE-XXVI had also:

- invited IOC regional subsidiary bodies to include representatives of ODIN projects (through their Steering Group Chair(s)) in their respective "board of officers",
- instructed the IODE Co-Chairs to discuss this IODE decision with the respective regional subsidiary body Chairs,
- instructed each ODIN to submit a detailed project proposal including a work plan and budget to IODE-XXVII, following the instructions for projects provided in IOC Manual and Guides Nr 81 and to take into account opportunities offered by the UN Decade of Ocean Science for Sustainable Development,
- established an inter-sessional working group to revise the terms of reference of IODE Ocean Data and Information Networks (ODINs) and develop a strategy for sustainability of the ODINs and to submit its report to the next meeting of the IODE Management Group (2022).

149 The Committee was informed that no progress had been made during the inter-sessional period.

150 **The Committee,** while recognizing the importance of IODE related capacity development in the regions, **decided to suspend** the ODIN (Ocean Data and Information Networks) projects, **noting** that IODE has become very active in most regions through its OBIS, ODIS/OIH, OTGA, OBPS, AquaDocs and others.

151 **The Committee encouraged** that IODE activities should be included in the work plans of the IOC Regional Subsidiary Bodies (RSBs) through active participation of IODE national coordinators (data management and information management), NODCs, ADUs and AIUs in meetings of the RSBs, and **requested** the IODE Secretariat to contact the regional IOC offices to ensure inclusion of data/information in the agenda of RSB meetings.

152 **The Committee welcomed** the offer by NMDIS (China), as ODINWESTPAC Secretariat, to actively participate in OIH/ODIS in preparation for new future arrangements of ODINs.

3.3.3 Structural Elements of the IODE Programme

153 This agenda item was introduced by **Mr Taco De Bruin**, IODE Co-Chair. Mr De Bruin noted that the IODE programme has been using the term "project" for all its activities since the 1990s for global as well as regional activities. Most of the projects have been formally established through an IODE Recommendation that was subsequently approved by the IOC Assembly (usually part of the overall Assembly decision on IODE. IODE Recommendations are usually submitted to the IOC Assembly because IODE Committee meetings are typically organized a few months before sessions of the IOC Assembly). The IODE Recommendation includes the terms of reference of the project as well as the terms of reference and initial membership of the project's steering group. Reference is made to agenda item 3.3.4 where rules of procedures are proposed to harmonize arrangements for all projects.

154 For some time however, it has been observed that naming our activities "project" creates the perception that these are activities that are limited in duration and thus also with finite resources. This is hampering IODE efforts to partner with other programmes and organizations that do not wish to embark on collaboration unless long-term sustainability of this collaboration can be expected.

155 Mr De Bruin therefore proposed a more appropriate naming of IODE activities:
  - **Programme Component (PC):** activity with core UNESCO/IOC RP funding and staff support, supplemented by in-kind and/or extra-budgetary support, that enables the activity to operate on a sustainable basis;
  - **Programme Activity (PA)**: Long-term activity receiving minimal UNESCO/IOC RP funding supplemented by in-kind and/or extra-budgetary support;
  - **Project**: Activity that is limited in time and is fully funded from extra-budgetary sources.

156 As an initial effort to express the long-term commitment of IOC/IODE to its activities Mr De Bruin proposed that ODIS, OBIS and OTGA should be considered as Programme Component. He noted that this should not change the rules of procedure discussed under agenda item 3.3.4 in terms of the creation of programme activities or their governance and management arrangements.

157 **The Committee approved** the designation of IODE activities as Programme Components, Programme Activities and Projects, considering that this should make IODE activities more attractive to partners for cooperation.

158 **The Committee decided** to designate ODIS, OBIS and OTGA as Programme Components and to take this into consideration in the work plan and budget 2023-2025.

159 **The Committee instructed** the IODE Management Group to (i) further clarify and finetune the naming definitions; (ii) propose the designation of all other IODE activities; and (iii) propose procedures to guide applications for new components, activities and projects, and submit these to the 28th Session of the IODE Committee in 2025.

3.3.4 Rules of procedure for IODE projects

160 This agenda item was introduced by **Mr Greg Reed,** IODE Consultant and Chair of the SG-QMF. He referred to Document IOC/IODE-XXVII/3.3.4 (Rules of Procedure for IODE Programme Components, Programme Activities or Projects).

161 He noted that IODE now has 15 projects. Most of these have been established through an IODE Recommendation submitted to the IOC Assembly for approval. The recommendations included the terms of reference of the project, the terms of reference of the steering group and in many cases the initial membership of the steering group. In most cases the steering group elected its own (Co-)Chair(s) and added members as needed. In some cases, a project manager was recruited (mostly for projects funded from extra-budgetary sources).

162 However, IODE has not adopted or documented any "rules of procedure" that assist new as well as existing projects in the drafting of the projects and steering group terms of reference, election of (Co-)Chair(s) and their terms of reference, election procedures etc. Document IOC/IODE-XXVII/3.3.4 (Rules of Procedure for IODE projects) proposes such rules of procedure for adoption by all IODE projects.

163 **The Committee thanked** the Secretariat for drafting the Rules of Procedure for IODE Programme Components, Programme Activities or Projects.

164 **The Committee approved** the "Rules of Procedure for IODE Programme Components, Programme Activities or Projects" and **instructed** all projects to adopt these in their management structure by the next meeting of the IODE Management Group (December 2023/January 2024).

165 **The Committee instructed** the Secretariat to publish the "Rules of Procedure for IODE Programme Components, Programme Activities or Projects" in the IOC Manuals and Guides series.

3.4   IODE QUALITY MANAGEMENT FRAMEWORK IMPLEMENTATION

3.4.1   Data Centre/ Information Centre accreditation: status and way forward

166 This agenda item was introduced by **Mr Greg Reed,** IODE Consultant and Chair of the SG-QMF. He referred to agenda item 3.2.1 which had covered applications for accreditation.

167 The Steering Group for the Quality Management Framework (SG-QMF) noted that some NODCs/ADUs have been accredited through another process, namely the Core Trust Seal (CTS) which certifies data repositories. Other data centres are considering CTS certification as has been noted in the responses received from the NODCs/ADUs. CTS certification is very similar to the IODE accreditation (see https://www.coretrustseal.org), however there are a few criteria in the IODE accreditation not covered by CTS, namely, IODE criteria 1.5 (Provide national reports to the IODE Committee) and 2.1 (Adherence to IODE Standards and Best Practice) which are IODE specific. The Steering Group recommended changes to the IODE accreditation process to include certification by CTS as meeting the requirements for IODE accreditation. Any NODC or ADU which has been certified by CTS will be awarded the status of Accredited IODE National Oceanographic Data Centre or Accredited IODE Associate Data Unit provided they can show evidence of (i) providing national reports to the IODE Committee and (ii) adherence to IODE Manuals and Guides No. 67. It was noted that all NODCs, ADUs and AIUs are invited to provide national reports but this has not been a formal requirement.

168 China (NMDIS) expressed its agreement with the suggestions put forward by SG-QMF and are willing to share the experience and technology of the National Marine Data and Information Service in applying for the QMF accreditation and recommend experts to join in the SG-QMF for the next intersessional period.

169 **The Committee welcomed** the progress of the IODE-QMF project while **noting** that more applications for accreditation would be welcomed.

170 **The Committee instructed** the SG-QMF to revise IOC Manuals and Guides No. 67 (IODE Quality Management Framework for National Oceanographic Data Centres and Associate Data Units (Revised edition)) to include the changes to the accreditation process.

171 **The Committee invited** Member States to nominate suitably qualified experts with experience in implementing quality management systems for management of oceanographic data to the SG-QMF for the next intersessional period and **instructed** the Secretariat to send out the call for experts as soon as possible.

3.4.2   IODE Project and activity performance evaluation: status and way forward

172 This agenda item was introduced by **Mr Greg Reed,** IODE Consultant and Chair of the SG-QMF. He recalled that IODE-XXVI had welcomed the proposed revision of IOC Manuals and Guides No. 81 and requested that all project leaders/managers use the new reporting form, included in the revised MG81 as Annex 2.

173 Mr Reed informed the Committee that the revision had been completed and is available as **IOC Manuals and Guides No. 81, rev2** on https://oceanexpert.org/document/29638

174 He further informed the Committee that all projects had been invited to use the revised document for the preparation of their project reports (see agenda item 3.3.1). He referred to Document IOC/IODE-XXVII/3.3.1 (IODE Annual Projects and Activities Reports 2021-2022).

3.5   PROGRESS REPORTS OF JOINT ACTIVITIES WITH OTHER IOC PROGRAMMES AND OTHER PARTNERS

3.5.1   IOC global programmes

175 This agenda item was introduced by **Mr Taco De Bruin**. He reported on cooperation with other IOC programmes:

Ocean Sciences (see Document IOC/IODE-XXVII/3.5.1)

- **Harmful Algal Information System (HAIS)**

176 **Ms Kirsten Isensee,** on behalf of Mr Henrik Enevoldsen, a.i. Head of IOC Ocean Sciences, reported that as part of the Flanders FUST funded DIPS-4 (Development of Information Products and Services for Ocean Assessments) project (2014-2021) the IOC published the first ever UN Global HAB Status Report (GHSR), which was released on 8 June 2021 and was an unprecedented analysis of Harmful Algal Bloom (HAB) events worldwide over the past 33 years. The co-authors of the GHSR mined both the global Harmful Algae Event Database (HAEDAT), which at the time consisted of 9,503 events with one or more impacts on human society, and the Ocean Biodiversity Information System (OBIS) database, which contained 7 million microalgal observation records, including 289,668 toxic algal species occurrences. Regional trends of microalgal observations in OBIS were used as a proxy for monitoring effort. Thanks to the financial support from DIPS-4-Ocean Assessments, the IODE/OBIS team also developed a new HAIS data portal (https://data.hais.ioc-unesco.org) which visualises the event data from HAEDAT with the HAB species occurrences from OBIS. Currently new funding is sought to support the further development and maintenance of the Harmful Algal Information System (HAIS) data systems including HAEDAT and OBIS HAB, which are both hosted by IODE.

177 **The Committee welcomed** the latest developments related to the HAIS data portal.

178 **The Committee expressed its support** for the continued development of and fundraising for the HAIS data portal, which will be crucial to future editions of the GHSR.

- **Global Ocean Oxygen Database and Atlas(GO$_2$DAT)**

179 **Ms Kirsten Isensee**, Programme Specialist, Ocean Science Section, presented a new initiative by the IOC working group 'Global Ocean Oxygen Network' (GO$_2$NE) and its Ocean Decade Programme 'Global Ocean Oxygen Decade'. The group is working toward the

implementation of the 'Global Ocean Oxygen Database and ATlas' (GO$_2$DAT, Ocean Decade project. The aim is to launch a coordinated international effort towards the building of an open-access GO$_2$DAT complying with the FAIR principles, providing access to data from the coastal and open ocean, measured from Eulerian and Lagrangian platforms, adopting a community-agreed metadata format, fully documented quality control and flagging procedures. A roadmap towards GO$_2$DAT involving the scientific community, data providers, data managers and end-users was published in December 2021 (Grégoire et al., 2021).

180   GO$_2$DAT would allow harnessing the potential of the increasing number of O$_2$ profiles, expected to quadruple in the frame of the future GOOS strategy. It will allow the user to make an informed choice on data that are fit for purpose and will facilitate the dissemination of information on ocean deoxygenation to a wide community of stakeholders. GO2DAT products will support the education of the young generation and general public.

181   IODE is a key partner in this effort to harness and establish, if required, standard operating mechanisms (OBPS), to build capacities (OTGA) and to connect with NODCs and ADUs, many of which are key stakeholders. Additional financial support will be required to develop GO$_2$DAT, with technical support provided by IODE, as GO$_2$DAT is expected to be a main contribution to Ocean InfoHub and at a later stage to ODIS.

182   GO$_2$DAT is suggested to make use of existing infrastructure and expertise from SeaDataNet and EMODnet both of which are built on the EU network of NODCs.

183   Ms Isensee expressed strong interest in collaboration with EMODnet.

184   The GO$_2$DAT Steering Committee, which comprises experts representing different communities (e.g. ARGO, regional and global databases and products, as well as GO2NE members), considers to establish an ocean oxygen ADU.

185   The Committee thanked Ms Isensee for the presentation and the introduction to the GO2NE/GOOD efforts.

186   **The Committee welcomed** the development of GO$_2$DAT, the cooperation with the IOC WG GO$_2$NE and GO$_2$DAT Steering Committee.

187   **The Committee encouraged** Member States, NODCs and ADUs to support the development of GO$_2$DAT financially and in-kind.

- **Cooperation with IOC Ocean Science Section in SDG 14.3.1 data portal**

188   **Ms Kirsten Isensee,** Programme Specialist, Ocean Science Section, informed the Committee that the SDG 14.3.1 Data Portal (https://oa.iode.org/), hosted and technically maintained at IODE, is a tool for the submission, collection, validation, storage and sharing of ocean acidification data and metadata submitted towards the Sustainable Development Goal 14.3.1 Indicator: Average marine acidity (pH) measured at agreed suite of representative sampling stations. In 2015, the United Nations adopted the 2030 Agenda and a set of Sustainable Development Goals (SDG), including a goal dedicated to the ocean, SDG 14, which calls to "conserve and sustainably use the oceans, seas and marine resources for sustainable development". The IOC of UNESCO was identified as the custodian agency for the SDG Target 14.3: "Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels", and the associated SDG Indicator 14.3.1 ("Average marine acidity (pH) measured at agreed suite of representative sampling stations").

189   Thanks to the cooperation and support provided by IODE, IOC is able to receive SDG 14.3.1 data and metadata. To further facilitate the submission, the version control and to lift the

burden of scientists, who are asked to provide data to several databases during the year. IOC established two tasks team, which work on the metadata and the vocabulary for ocean acidification data, with the aim to develop a federated system for ocean acidification data. With continuous support by IODE, the SDG 14.3.1 portal would become one of the platforms to be harvested on a regular basis and could act as a mirror to support visualization/ exchange and ensure long term availability of the data. Additional financial support was obtained to develop some, but not all, additional functionalities in the SDG 14.3.1 portal: (i) allow upload of data sets to the in other formats than excel; (ii) identification of relevant data bases and agree on similar metadata templates; (iii) establishment of a federated system to harvest SDG 14.3.1 relevant data on a regular basis (adoption of ERDDAP technology), (iv) improve the visualization available on the 14.3.1 SDG indicator portal.

190 EMODnet expressed its willingness to contribute data to the SDG 14.3.1 data portal. Ms Isensee noted however that the capacity currently does not exist to harvest data.

191 **The Committee welcomed** the latest developments related to the SDG 14.3.1 data portal presented.

192 **The Committee invited** NODCs and ADUs, as well as relevant existing regional networks, to participate in the upcoming data collection calls.

193 **The Committee expressed its support** for the continued involvement of the IODE Secretariat in the further development of the SDG 14.3.1 data portal, which will be a crucial contribution to ODIS.

Global Ocean Observing System (GOOS)

194 **Ms Emma Heslop,** Head OOS, reported that with technical support from the IODE/OBIS team, the Global Ocean Observing System (GOOS) has been able to develop and launch the GOOS BioEco Portal on 21 July 2022, online at https://bioeco.goosocean.org. The Portal provides an interactive map that delivers a global picture of the sustained biological and ecosystem ocean observing programmes. The information about each programme includes the variables observed, the state of development of the programme, the standardisations and specifications used to collect observations, and the programme's observing capability (or readiness level). This information from the metadata that travels with the observation data. The observation data collected by each programme can be found in data systems such as OBIS, and links to the data can be added in the Portal. The portal currently has information from 592 monitoring programmes globally. One of the future goals of the BioEco Portal is to create an automated flow of data and metadata from ocean observing programmes to the Portal and data management systems such as OBIS. By 2025, OBIS is aiming for 90% of active BioEco monitoring programmes to have up-to-date entries in the BioEco Portal, with 80% having established data flow connections to OBIS. By 2025, the BioEco Portal is also aiming to have established a m2m (machine to machine) connection with the GOOS monitoring and support facility hosted by OceanOPS in Brest, which will make views across physical, biogeochemical, biological and ecological observing possible, and also facilitate linking BioEco observation information to the annual Ocean Observing System Report Card, which provides an annual an assessment of the status of the ocean observing system (see https://www.ocean-ops.org/reportcard).

195 She further reported on the GOOS Observations Coordination Group (OCG) cross-network data implementation management strategy which is focused on developing requirements and implementing data best practices that will improve access, use, and interoperability of the data collected by the individual OCG networks. This work builds on the OCG effort in the

intersessional period to map the data flows of the 12 global ocean observing networks under the OCG (see https://www.goosocean.org/index.php?option=com_oe&task=viewDocumentRecord&docID=31176). The goals of the implementation strategy are to ensure high- quality data are: 1) freely available through findable and accessible services, 2) well documented, 3) preserved for future generations and, 4) citable. The strategy is based around the FAIR (Findable, Accessible, Interoperable and Reusable) data principles and fully leverages existing standards and best practices found within the community, where possible. She also reported on the goal of the GOOS OCG to develop a Federated network of data services as part of the strategy which will provide increased discoverability and availability of OCG data and metadata, in close cooperation with OceanOPS. This federated network will serve as the connection to IODE as it will be the focal point through which the relevant information will flow into the ODIS. This Strategy will be a living document, enabling agility in the face of technological and data management innovations. Lastly, she emphasized the continuing success of the OCG networks in providing near-real time data to the global operational centers, through the WMO Global Telecommunication System (GTS), in support of forecasting requirements. She further referred to agenda item 3.3.1.9 (IODE/GOOS OBPS) demonstrating close cooperation between GOOS and IODE.

196 **Dr David Berry**, WMO, noted that there was an upcoming webinar (18th April 2023) on the replacement of the WMO GTS and the evolution of the WMO Information System (WIS 2.0). Information on the GOOS webinars can be found at: https://www.goosocean.org/index.php?option=com_oe&task=eventCalendar&ID=34&Itemid=131 . Further information on the WMO Information System can also be found in IOC/IODE-XXVII/3.5.3inf2 (https://oceanexpert.org/document/31954).

197 **The Committee instructed its Co-Chairs** to engage with the OCG Data Strategy Implementation Plan to ensure that it is fit for purpose from the ocean data management community standpoint.

198 **The Committee urged** IODE experts to participate in (online) OCG meetings.

199 **The Committee noted with appreciation** the ambitious plan for a BioEco Data Portal that is an integrated resource for national, regional and global ocean observing system monitoring and planning, and **instructed** IODE OBIS to identify the resource needs to fulfil this in a 2023-2025 planning proposal.

Tsunami Resilience Section (TSR) and the IOC Tsunami Information Systems

200 **Mr Denis Chang Seng** was not present at the Session so this agenda item was briefly summarized by **Mr Taco De Bruin**. He explained that the IOC Tsunami Resilience Section is working with the OceanTeacher Global Academy to develop training courses to be delivered by the two OTGA Specialized Training Centres (STCs) in Indonesia and at ITIC. Courses planned 2023-24 include:

- Tsunami Awareness. An overview covering hazard assessment, warning, preparedness, mitigation, response;
- Tsunami Early Warning Systems (TEWS). Components of, and requirements for robust, reliable, and effective TWS;
- TWC Staff Basic Competencies. Information and skill requirements for TWC staff.

201 **The Committee** took note of the activities undertaken with the TSR and **invited** TSR to consider more extensive collaboration through relevant IODE activities.

202   **The Committee noted with appreciation** the continued support by the Flanders Marine Institute (VLIZ), an IODE NODC, of the IOC Sea level Station Monitoring Facility (SLSMF).

Marine Policy and Regions

203   **Mr Taco De Bruin** informed the Committee that no reporting had been received from IOC/MPR. He briefly informed the Committee that discussions were being held to create courses in OTGA for the MSP Global 2.0 project that is expected to start in 2023.

3.5.2   IOC regional programmes (sub-commissions and regional committees)

204   This agenda item was introduced by **Mr Ward Appeltans**. He reported that no input was received from the regional Secretariats except from IOC/WESTPAC.

WESTPAC

205   The IOC Sub-Commission for the Western Pacific has been making continued efforts in encouraging IOC Member States in the region to develop capacity for ocean data and information management, and share data and information via established NODCs, and IODE ADUs and OBIS country nodes in the region, to the IODE global network and beyond. However, it seems most of these institutions are faced with grand challenges, including limited human and financial resources and adequate policy support, which impede the delivery of more quality services to meet the needs of member states. The Regional Secretariat has been understaffed and overstretched with unprecedented demands of Member States in the region. Reinforcing the regional Secretariat is necessary in order to assist Member States in further developing their data and information management in the region.

206   Mr Appeltans noted that, while no reporting had been received from IOCAFRICA, IOCARIBE (due to the departure of Dr Cesar Toro early 2022, replaced by Lorna Inniss in 2023) and IOCINDIO there were several IODE activities ongoing in the regions:
-    OTGA: this project is active in the IOCARIBE, IOCAFRICA, IOCINDIO and WESTPAC regions through its network of Regional Training Centres and Specialized Training Centres (see agenda item 4.1.1);
-    Ocean InfoHub/ODIS: The OIH project is active in Latin America (including IOCARIBE), IOCAFRICA and Pacific SIDS (see agenda 6.5).

207   **The Committee thanked** the Government of Flanders (Kingdom of Belgium), Norway (NORAD) as well as Member States hosting training centres and contributing to OIH/ODIS and **urged** them to continue this support.

208   **The Committee noted** the concerns expressed by the WESTPAC Secretariat and **recommended** that discussions should be held between the WESTPAC Member States, NODCs, ADUs and AIUs in that region, to identify needs and possible supporting measures.

3.5.3   Post JCOMM: JCB

209   This agenda item was introduced by **Dr Sergey Belov,** IODE Co-Chair. He informed the Committee that two information documents have been submitted by WMO, available from the IODE-XXVII web site. He recalled that IODE-XXVI "noting the restructuring of WMO, recommended that further discussions on this topic would be needed with the Joint WMO-IOC Collaborative Board (JCB) and requested Dr Sergey Belov, IODE Co-Chair, to start those discussions." and "noting the abolishment of JCOMM, decided to abolish the ETDMP and

invited IOC to discuss with WMO through the Joint WMO-IOC Collaborative Board (JCB) the form of future collaborations on data and formation management and ocean best practices aspects via the joint projects, ETs, other forms." On behalf of WMO and IOC, in 2021 the JCB has developed "WMO-IOC Collaborative Strategy (2022-2025) to maintain, strengthen and promote links among the weather, water, climate, and ocean communities in order to achieve the Visions of both IOC and WMO, building on a long history of cooperation". Second session of the JCB met online on 1 March, 2022 (report can be found at https://oceanexpert.org/document/30477). The meeting discussed a series of co-developed IOC/WMO presentations, looking at potential areas for collaboration across research, observations, data, modelling, services, and capacity development. This gave the JCB a view of progress of over the past year and where joint action could add value. A joint collaborative workplan for 2022-2023 was agreed. IODE continued to promote and expand on the work being done through its projects and activities (OTGA, OBPS, OIH, etc.). It was agreed that WMO and IODE will collaborate on the global data ecosystem under decade and using ODIS and WIS and Coordinate the data-related activities under the UN Decade of Ocean Science for Sustainable Development (2021-2030).

210   **The Committee welcomed** the development of the "WMO-IOC Collaborative Strategy (2022 - 2025)".

211   **The Committee urged** IOC Member states to work on closer collaboration on interoperability between IOC/IODE OIH/ODIS and WMO WIS 2.0.

212   **The Committee instructed** the Secretariat to invite WMO to join IODE activities under the Ocean Decade.

3.5.4   Participation in European Commission Projects

213   **Mr Ward Appeltans** introduced this agenda item. To implement the European Green Deal and the European Biodiversity Strategy, Europe has launched the Horizon Europe 2021-2024 framework with five missions of which 'Restore our Ocean and Waters' and 'Adaptation to Climate change' are directly relevant to us.

214   Currently the IODE Secretariat (through OBIS) participates in four new EU Horizon projects:
- Under Mission Climate, Cluster 6 Biodiversity and ecosystem services:
  - HORIZON-CL6-2021-BIODIV-01-12: Improved science based maritime spatial planning and identification of marine protected areas
    - Project: Marine Protected Areas Europe (MPA Europe)
  - HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems
    - Project: MARine COastal BiOdiversity Long-term Observations (Marco-Bolo)
- Under Mission Ocean:
  - HORIZON-MISS-2022-OCEAN-01-07: Integration of biodiversity monitoring data into the Digital Twin Ocean
    - Project: DTO_BioFlow (led by VLIZ)
  - HORIZON-MISS-2022-OCEAN-01-09: Towards a European e-DNA library of marine and freshwater species
    - Project: A Plan towards an eDNA reference library and data repository for Aquatic Organisms, navigating Europe towards the next generation biodiversity monitoring (eDNAquaPlan)

215 Italy noted that there are many new initiatives that involve NODCs and regretted that these other initiatives are not mentioned. The IODE Co-Chair noted that the above list refers to projects in which IODE is directly involved.

216 **The Committee invited** IODE NODCs, ADUs and AIUs to report (as part of the reporting in preparation for IODE Committee meetings) on projects, programmes and other initiatives in which they are involved and relevant to IODE.

217 The representative of the European Commission welcomed the participation of IODE secretariat and members in EC funded Projects related to Ocean Observation, Data and the development of related added-value Services, including Digital Twins of the Ocean. The European Commission related projects aim to support European and international capacity in the aforementioned subjects and provide direct and indirect contributions to the objectives of the UN Ocean Decade and for this, collaboration with existing structures as the IODE, is necessary and desirable.

218 The representatives from DG-MARE (Z. Konstantinou) and EMODnet (J-B Calewaert) explained that EMODnet is a long-term operational service and they intend to map their decade activities.

219 **The Committee welcomed** the active participation of the IODE Secretariat in these Horizon Europe projects which strengthen IODE projects, brings additional staffing resources and brings an international perspective into these EU projects.

220 **The Committee strongly recommended** NODCs and ADUs in Europe to consider involving IOC/IODE as a partner in future EU project proposals.

3.5.5   ISC World Data System (WDS)

221 **Mr Taco De Bruin,** IODE Co-Chair invited **Ms Meredith P. Goins**, Executive Director, WDS International Program Office to briefly introduce this agenda item. Ms Goins informed the Committee that WDS, an affiliate member of the ISC (formerly the ICSU), continues to support its membership of scientific data repositories through engagement, training, and programming. Recent and upcoming programs include:

(i)   International Data Week, held in partnership with Research Data Alliance, CODATA, and local hosts organizations in Seoul, Republic of Korea in 2022, with future locations to include Salzburg, Austria, in 2023, Brisbane, Australia, in 2025 and Cape Town, South Africa, in 2027;

(ii) Towards a FAIRer World: Implementing the UNESCO Recommendation on Open Science to address global challenges, a symposium co-organized by UNESCO, International Science Council (ISC) Committee on Data (CODATA) and World Data System (WDS) 29 March 2023

(iii) Canadian CoreTrustSeal Cohort trainings

(iv) Polar to Global Online Interoperability and Data Sharing virtual workshop/hackathon 26 January 2023

(v)   WDS Sustainability Summit for current and potential members will be held July 2023 in Knoxville, TN, United States.

222 WDS noted that CoreTrustSeal certification is required for its members and repositories and encourages IODE members to work towards new or maintaining certification of their repositories to continue to build a trusted network of repositories and data services. Additionally, in addition to domain specific standards and principles, WDS advocates for the

implementation and use of agreed-upon international standards and principles, such as the FAIR, CARE, and TRUST principles.

223   **The Committee thanked** all data repositories for their continued engagement in global open science.

3.5.6   Aquatic Sciences and Fisheries Abstracts (ASFA)

224   This agenda item was introduced by **Ms Tamsin Vicary** (ASFA Secretariat, Fisheries Information and Knowledge Management Team (NFISI), Food and Agriculture Organization of the United Nations)**.** She reported that IOC (through IODE) is a founding partner of the FAO ASFA and is a member of the ASFA Advisory Board. Through the AquaDocs Project, IODE is working with the new OpenASFA repository initiative under a Letter of Agreement to provide updates to the IOC document deposits. In addition, the LOA Agreement includes working together on hosting a 2022 joint conference, training sessions, harvesting, import/export scripts and vocabularies.

225   **The Committee proposed** that the ASFA Secretariat impact study explores further cooperation between OpenASFA and AquaDocs assessing the impact on user communities and identifying any actions to support SDGs, the Ocean Decade and joint market opportunities.

3.5.7   Cooperation with the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC)

226   This agenda item was introduced by **Ms Jennifer Walton** on behalf of Ms Saida Messaoudi (IAMSLIC President 2022-2023). She reported that IODE has an enduring relationship with (IAMSLIC) and over the years has supported many IAMSLIC initiatives under a joint MOU. A new MOU requires to be discussed but the main area of cooperation is the successful AquaDocs, the joint repository of IODE and IAMSLIC (merged from OceanDocs and the Aquatic Commons Repositories) where IAMSLIC provides the staff resources for repository management and IODE supports the hosted repository subscription. IAMSLIC also offers IODE access to their 200+ marine science information professionals.

227   **The Committee recommended** IODE and IAMSLIC to continue their relationship and create a new MOU of activities of mutual interest, including the provision of ongoing support by IOC/IODE and IAMSLIC to ensure the continuity of the AquaDocs Repository.

3.5.8   Cooperation of IODE in the Ocean Decade

228   This topic is covered under agenda item 6.1.

3.6 OUTCOME OF THE "INTERNATIONAL OCEAN DATA CONFERENCE - THE DATA WE NEED FOR THE OCEAN WE WANT" I AND II

3.6.1 International Ocean Data Conference I - The Data We Need for the Ocean We Want"

229 This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair. He referred to the web site of the Conference available from https://oceandataconference.org. The first conference (the first in a planned series) was held in Sopot, Poland, between 14-16 February 2022 as a hybrid event. It was organized jointly by the Government of Poland through the Institute of Oceanology, Polish Academy of Sciences (IOPAN), the IODE Programme of the IOC and the Decade Coordination Unit. It was attended by 591 online and 60 on-site participants. The main objectives of this Conference were **to consider regional and global strategies and policies needed to achieve the digital ecosystem, to discuss existing and required technological developments and their implementation, and to identify future directions in ocean data and information management.** The mentioned objectives would furthermore be considered within the multi-sectoral vision of the Ocean Decade.

230 The conference made several recommendations to be acted upon mainly by the global ocean data and information management community:
- need for increased efforts in standardisation, best practices and harmonization as well as wider application of FAIR and CARE principles;
- increase the widest community engagement including citizen science, indigenous knowledge and improving data literacy;
- need to increase efforts in global data and information system interoperability and networking to achieve a global ocean digital commons and data ecosystem, also achieving interconnection and integration of data systems (digital twins) from different disciplines and sectors (including private sector) related to the ocean;
- foster integrated multi-hazard warning systems within Earth System Observation, Research, and Prediction programmes, not only aiming on ocean health, but manifesting the 7 Decade's societal outcomes underlining the qualities of the ocean and of the people.

231 In the context of the Ocean Decade, the global ocean data and marine value chain community will have collectively enabled a 'living' digital ocean data ecosystem:
- data provenance will be fully traceable via a common set of metadata enriched with thematic/sector/uptake relevant tagging information e.g., relevance to EOVs, SDGs;
- the ocean data ecosystem will be fully machine-machine searchable and actionable, meaning that when data or metadata are updated these are automatically updated throughout the data pipeline and when new data are made available these are automatically harvested and made available through the global digital commons;
- networks of information are needed that are globally distributed to achieve the harmonisation of standards;
- science-based quality requirements are also needed – co-developed by the marine data community – so that data and information are fit for multiple use.

232 Extensive news reporting was carried out by the IOC and IODE Secretariats on the outcome of the conference (e.g. https://ioc.unesco.org/news/international-ocean-data-conference-2022-concludes-new-commitments-achieving-global-ocean)

233 Nearly all presentations together with abstracts are available on https://oceandataconference.org/programme/ . A summary of the outcomes was prepared.

234 Mr De Bruin further informed the Committee that a short survey had been organized after the Conference to obtain feedback from the participants. The results of the survey are available from Document IOC/IODE-MG-2022-5.2. Mr de Bruin briefly summarized the outcome:

- 85% found the programme interesting and well designed;
- 73% found the presentations just long enough and 24% found them too short;
- 89% found the quality of the presentations excellent or good;
- 53% had no technical problems with their online participation while 14% had some problems;
- 92% found that the next Conference should also be organized as a hybrid event.

3.6.2 International Ocean Data Conference II - The Data We Need for the Ocean We Want"

235 This agenda item was introduced by **Mr Taco De Bruin**, IODE Co-Chair. He referred to the web site of the Conference available from https://oceandataconference.org. The second Conference was held at UNESCO Headquarters in Paris, France as a hybrid event between 20-22 March 2023, just prior to IODE-XXVII. The event was attended by 160 participants on site and 296 online. A detailed summary report is attached as Annex IV.

236 Mr de Bruin reported that the goal of IODC-II was to focus on the implementation of the commitments and main recommendations identified at IODC-I, and therefore was organized around four sessions following those recommendations:

(i) **Session 1: Implementing the FAIR and CARE principles for ocean science and sustainable development -** Specific recommendations:
  - The community should continue investing on developing systematic data integration services // Importance to create rich and consistent metadata models [SimonsCMAP]
  - Sharing data does not mean it is FAIR! Formats are important, as well as providing APIs in combination with rich metadata to enhance data discovery & harvesting [ASFA]
  - Connection across communities with different levels of technological maturity is important, to enhance capacity building [ASFA]
  - Controlled vocabularies are important to reach harmonised FAIR data [ASFA]
  - Terms Of Use/licensing: recommended to keep as open as possible - CC BY and the removal of restrictions to data unless it is absolutely essential [EuroGOOS Data Policy]

(ii) **Session 2: Community engagement and capacity development in data literacy** – Recommendations:
  - Improve cooperation mechanisms for multi-stakeholder partnerships, especially between scientific and educational institutions. This is specifally true when we discuss about the role of education and how collaboration with educational institutions can help not only in training and mentoring of early career professionals, but also in inculcating more positive perception and awareness about the ocean and ocean related careers. And this can start as early as primary schools, in collaboration with aquariums, museums and other related institutions. Perhaps many of us are now active in the ocean

domain because of an interest in the ocean that was awaken from a specific experience when we were young.

- Innovative and creative approaches especially on outreach and communication strategies to reach wider potential user communities, such as the youth, indigenous groups, non-technical community groups and specific stakeholder sectors. All the high technical knowledge and background on ocean data can be intimidating especially for non-technical communities outside of professional ocean networks with no background or training in ocean science. Thus the need for innovative and creative ways to break down complex, difficult concepts into intuitive, human-friendly models or creative channels that can entice stakeholders to be motivated in participating and contributing to our common goals especially when there is guidance and support available to specific stakeholder groups.
- Enhanced documentation of experiences and promoting best practices on community engagement and empowerment. Other than replication purposes, best practices can also support communities' engagement and interoperability through sharing broadly the same baseline of understanding and references from respective communities of practice.
- Embed capacity development through transdisciplinary approaches and co-design from project conceptualization to implementation. This is critical to ensure that existing capacity and resources are considered in project designs and their capacity development needs are embedded and addressed in every stage as part of the project outcomes and deliverables.

(iii) **Session 3: Global ocean digital ecosystem** – Recommendations:

- Foremost, coordination, co-governance, and continuous testing of digital interoperability norms is needed at all levels of the ocean digital ecosystem
  - o Consensus building is hard, but when it works, it multiplies effectiveness.
  - o The DCOs, DCCs, and similar mechanisms should dovetail recommendations with those of OGC, RDA, ISO, TDWG, and other prevailing standards organisations - we need to evolve what's there, not build new "standards and best practices" when they're not needed.
  - o We should have clear, common, and computable maps of data and service flows, so we're all on the same page and can resolve niche crowding or gaps.
- We must update our metrics for success: how well new components (large or small) are embedded within the ocean digital ecosystem is key
  - o When each regional, national, thematic, or other digital system can federate queries/responses to others in one go, we're transforming the game.
  - o One stop shops are useful, but globally accessible digital supply chains are more valuable to more stakeholders.
- The Decade Data & Information Strategy will focus on the engineering of a global digital ecosystem
  - o As potential/actual co-implementers, we should rally and challenge this strategy and the implementation plan that will emerge over the

next year.

(iv) **Session 4: Interdisciplinary, societal needs** – Recommendations:
- There is a need for reflexive, policy-relevant, and engaged ocean science.
- The conference calls for more inter- and transdisciplinary research practices, ensuring more diversity, transparency, equity, inclusion and trust, which are necessary to bring transformational change to our society.
- Efforts to improve ocean data use require social sciences' support to analyse user needs and how different actors with different data practices can best collaborate, integrate their knowledge, and avoid injustices and discrimination. Social sciences should assess underlying needs, values, and norms of scientists or database managers that shape data-related practices, and these qualitative insights may be fruitfully aligned with insights from quantitative analyses of data usages and information flow patterns at larger scales.

237 **The Committee instructed** the IODE Co-Chairs to prepare a brief statement for the 32nd Session of the IOC Assembly (June 2023) on the outcome of IODC-II.

238 **The Committee instructed** the IODE Management Group to prepare a proposal on the way forward to take the recommendations from IODC1 and IODC2 into consideration in the work plan of IODE during the next inter-sessional period (April 2023-March 2025) as well as in the preparations for IODE-XXVIII.

239 **The Committee thanked** the local organizers for the excellent organization of the Conference which was attended by 160 participants on site and 296 online.

4.   IODE CAPACITY DEVELOPMENT

4.1   CONTRIBUTIONS OF IODE TOWARDS THE IMPLEMENTATION OF THE IOC CAPACITY DEVELOPMENT STRATEGY

4.1.1   OceanTeacher Global Academy project: Phase 2

240 This agenda item was introduced by **Mr Greg Reed** (OTGA Project Manager).

241 He informed that the new ISO 29993 Certification of the IOC Project Office for IODE, Oostende, Belgium as a learning services provider was awarded in March 2022, following a forced pause due to the COVID 19 pandemic which prevented the necessary onsite audit to take place in 2021.

242 He reported that the OTGA-2 project implementation was highly impacted by the pandemic, but this has provided an opportunity to explore the possibility of implementing online learning and developing best practices on how to better address the training needs of the IODE and wider IOC community. Despite the necessary adaptations, most training centres successfully delivered at least one online training course during this reporting period. The OTGA Secretariat made an important effort in guiding and supporting all training centres in adapting to this new mode of course delivery, including recruiting an e-Learning Designer and providing

a training course on Designing Online Training courses as well as one to one coaching for every course and uploading training contents on the e-Learning Platform.

243   He added that between May 2021 and August 2022 the OTGA delivered 37 courses in 3 languages and hosted another 10 courses for other organisations/stakeholders, including VLIZ, BODC/MEDIN, IALA and POGO/AWI Centre of Excellence. All courses during this period have been delivered online and instructor-led, with a small number of self-paced offered. Over 1800 people started a course and of these over 60% successfully completed it. For the first time the courses delivered in Spanish outnumbered those delivered in English, thanks to the active training centres in Latin America. A large number of learners from the Pacific Islands have also received training.

244   The third OTGA 2 Steering Group meeting was held between 21-23 November 2022 as a hybrid event. The Steering Group welcomed the IOC Science and Communication Centre on Harmful Algae from the University of Copenhagen, Denmark as an OTGA Specialized Training Centre. The SG-OTGA elected Mr Udaya Bhaskar (RTC-India) and Mr Aidy Muslim (RTC Malaysia) as the Co-Chairs of the Steering Group.

245   The OTGA Secretariat implemented a Small-Scale Activity (funded by FUST) to better manage the administration of learners and to provide required project reporting. The OceanTeacher Global Academy Alumni System has implemented interaction between the OTGA administration and the learners through a system which will be able to manage alumni data of OTGA past and present learners and provide a single registration for learners, through Ocean Expert, when enrolling for OTGA courses. The system will improve the overall IOC CD reporting requirements for UNESCO as well as to individual Member States.

246   The OceanTeacher website was fully redesigned and now runs on Moodle version 3.11.

247   The OceanTeacher Global Academy was endorsed as an action under the UN Decade of Ocean Science for Sustainable Development in October 2021.

248   He further informed the Committee that Dr Cláudia Delgado had left the IOC Project Office for IODE on 15 January 2023 to take up a position at the University of Ghent (Belgium) dealing with Marinetraining.eu which is also a partner in the Ocean InfoHub.

249   China extended congratulations to the OTGA project on its success during the inter-sessional period. Despite the impacts of the COVID-19, OTGA moved forward with exciting progress. OTGA China Regional Training Centre, which is co-host by National Marine Data and Information Service (NMDIS) and National Centre for Oceanographic Standards and Metrology (NCOSM) organized two online training courses in 2021 and 2022. The next training course on marine information technologies will be held in May 2023. The enrolment has begun with the assistance of the OTGA Secretariat. Many thanks to the OTGA Secretariat for their instruction and support. Meanwhile, NMDIS operates the International Ocean Institute (IOI)-China Regional Center for the Western Pacific Region, providing annual training on integrated ocean governance and marine information technology. There are over 600 alumni of IOI-China from over 30 countries in the Western Pacific region, Africa and Pacific Island countries. As the host centre of both IOI-China and OTGA China, NMDIS would like to explore the collaborative opportunities between IODE and IOI, making better contribution to the capacity development of IOC Members in the Western Pacific region.

250   INVEMAR (Colombia) proposed recommended member states to cooperate with Regional Training Centres as well as Specialized Training Centres to explore opportunities for near future project proposals to apply to international calls that involve training in ocean data and information management.

251 **The Committee expressed its great gratitude** to Dr Cláudia Delgado who, as leader of the OTGA team during more than 10 years, has turned the old training paradigm of continuous professional development (CPD) with ad hoc in-person courses taught in a classroom environment, into a vibrant inclusive hybrid environment including in-person courses held in a growing network of regional (RTCs) and specialized training centres (STCs) around the world. **The Committee wished her well** in her new position and also looked forward to continued cooperation.

252 **The Committee thanked** the Government of Flanders (Kingdom of Belgium) for its continued support of IODE and its OceanTeacher Global Academy.

253 **The Committee further** thanked the institutions that have agreed to host and support an IODE OTGA Regional or Specialized Training Centre.

4.1.2 CD activities of other IODE projects

254 **Mr Ward Appeltans,** IODE Secretariat and OBIS project manager, reported that with support from NORAD, OBIS has been developing short tutorials as a step-by-step guide to support Member States to manage, publish and access data from biological observing systems through OBIS following internationally agreed standards and best practices. These tutorials (notebooks and videos) are posted on the OBIS YouTube channel, the OBIS online manual (https://manual.obis.org) and are available for OBIS training courses on the OTGA e-Learning Platform. So far, OBIS has trained 362 people from 73 Member States at 24 OBIS training courses (see alumni list by country: https://obis.org/training/alumni/). The OBIS manual captures most of the information, but we realised that to scale up and reach a wider audience, we needed to redesign and diversify our training resources. Short notebooks and tutorial videos add a visual aid to the topics, which are often very technical. We hope this way we can reach thousands of professionals.

255 As part of the PacMAN project, we organised the first Marine Invasive Species Early Detection: Utilising Molecular Tools training course in Fiji, which ran from 31 October until 18 November 2022 and included an online self-paced part covering the theoretical aspects and a week-long face-to-face part covering the practical field and lab activities. Twenty-one (21) managers and technical staff from 7 local and regional governmental agencies were trained in sample collection and organism sorting, including taxonomy and processing for DNA extraction, eDNA and PCR analyses, as well as data analysis and data sharing protocols. Developing the scientific capacity in Fiji for early detection using environmental DNA is an important step in the establishment of a regional early warning system (alert network) for marine invasive species in the Pacific Islands. In 2023, the project will enter into the operational phase with regular monitoring and a risk analysis and decision support system. We hope by developing the capacity locally this will become a long-term sustained activity in Fiji and gradually will be rolled out in other Island states effectively forming a network of interconnected nodes, which is important for the prevention and mitigation of the spread of invasive species.

256 The IOC/OTGA/OIH Training course: Implementing the Ocean Data and Information System (ODIS) architecture remains open online for asynchronous participation. https://classroom.oceanteacher.org/course/view.php?id=722. The course has just been translated into Spanish, French and Portuguese, and courses in these languages will be available as from April 2023 https://oceanexpert.org/event/3827. Two short in-person training sessions have been held at the GeoBluePlanet Symposium (Ghana 23-28 October 2022).

257 <mark>**The Committee** welcomed the training related activities undertaken by OBIS and OIH with support from OTGA and **thanked** the Government of Flanders (FUST) (Kingdom of Belgium) and Government of Norway (NORAD) for their financial support which made this possible.</mark>

4.1.3 Other potential IODE contributions towards the CD strategy

258 This agenda item was introduced by **Ms Johanna Diwa**, IOC CD Consultant. She reported that the 31st Session of the IOC Assembly (IOC-XXI) adopted Decision IOC-A-31/3.5.3 extending the IOC Capacity Development Strategy until July 2023. The IOC Assembly also approved the revision of the Terms of Reference of the IOC Group of Experts on Capacity Development and instructed the group to continue its work on the revision of the IOC Capacity Development Strategy.

259 At the fourth Session of the GE-CD, held as a hybrid event on 25 November 2022, the Group renewed its membership, and approved the draft IOC CD Strategy 2023-2030 for submission and adoption by the 32nd IOC Assembly in 2023, including an outreach proposal to promote greater visibility and reach.

260 The draft IOC CD Strategy 2023-2030 identified 6 outcomes, 16 activities and 31 actions. While it retained the major outputs from the earlier version of the Strategy, the proposed draft builds on ongoing activities making use of existing initiatives to respond to desired outcomes which are all interrelated and essential. Since the IODE has a very extensive range of relevant CD actions responding to many of these outputs, it is envisioned that the IODE will continue to make use of its existing CD focused programmes and projects.

261 By providing equitable access to global databases and better visibility of national and regional data holdings while also offering capacity development opportunities to all to participate equitably, the Ocean InfoHub ocean data ecosystem project contributes to the implementation of the proposed Strategy by promoting and facilitating access to ocean data and information that focuses on transfer or local knowledge, supporting early career ocean professionals and addressing gender disparity by increasing access to information, technologies and opportunities.

262 OBIS projects, through PacMAN and eDNA expeditions, can further contribute to develop local science capacity through collaborative efforts involving (citizen) scientists and local stakeholders, and through the creation of manuals and tutorials for training courses on biological monitoring using eDNA, including how to manage and analyze and interpret these molecular data.

263 The Ocean CD-Hub (https://oceancd.org), an online search tool for capacity development opportunities around the world was launched on 3 February 2023. Since this global search platform for capacity development opportunities in ocean science and management will be coordinated by IODE Project Office, NODC/ADUs can streamline its CD activities and contribute to ensuring a better-targeted approach for CD interventions that are country-driven and needs-based, providing access and relevance to specific national priorities and needs of Member States.

264 The Committee was informed that the planned Decade CD Facility (funded by the Government of Flanders, Kingdom of Belgium) will use the Ocean CD-Hub to allow storage of CD opportunities within the framework of the Decade.

265 INVEMAR (Colombia) welcomed the CD-Hub initiative and recommends having OTGA clearly visible in the Hub. This could be accomplished by including a box, in the same style of the ones already in the CD-Hub webpage with the label "OTGA Training Opportunities".

266 <mark>**The Committee welcomed** the development of the Ocean CD-Hub as a useful tool to implement CD-related activities of IODE's existing programmes and projects.</mark>

267 <mark>**The Committee encouraged** NODCs/ADUs/AIUs to explore ways and opportunities to streamline their CD activities utilizing the Ocean CD-Hub.</mark>

4.1.4   Reporting on the ODINs

268 This agenda item was discussed under agenda item 3.3.2.

5.   IODE COMMUNICATION AND OUTREACH

5.1   RE-DEVELOPMENT OF THE IODE WEB SITE

269 This agenda item was introduced by **Ms Sofie de Baenst,** IODE Secretariat. She recalled that IODE-XXVI had recommended to allocate funds in the 2021 budget for the redesign of the IODE web site, taking into account the recommendations of the review. Unfortunately, due to the budget reductions as from 2022 this was not possible. IODE-XXVI had also instructed the IODE Secretariat and Co-Chairs to establish a small working group of volunteers to draft the new structure of the IODE web site, prior to contracting the redesign and other technical tasks.

270 Ms de Baenst reported that the working group discussed a new structure in 2021 and a company was contacted to study the cost of redesign. As there was no budget anymore and due to limited time, the communication with the contractor and with the small working group did not continue.
INVEMAR (Colombia) recommended increased use of social media for communication. In this regard INVEMAR offered to send information items to the IODE Secretariat,

271 <mark>**The Committee instructed** the working group (to draft the new structure of the IODE web site), to restart the discussions on the restructuring of the website and the IODE Secretariat to proceed with the redevelopment by end of 2023.</mark>

6.   THE FUTURE OF IODE

6.1   IODE CONTRIBUTION TO THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

6.1.1 The IWG-SODIS

272 This agenda was introduced by **Dr Hernan Garcia,** Chair IWG-SODIS. He recalled that IODE-XXV adopted Recommendation IODE-XXV.5.3 on the establishment of the inter-sessional working group to propose a strategy on ocean data and information stewardship for the Ocean Decade (IWG-SODIS) which, inter alia, was instructed to "Prepare a proposed Ocean Data and Information Stewardship Strategy". The IWG-SODIS has elaborated a data and information strategy for the Ocean Decade. Reference was made to Document IOC/IODE-MG-2021/5.1 (Proposed Data and Information Strategy for the Ocean Decade (prepared by IWG-SODIS).

273 He further recalled that IODE-XXVI had adopted [Decision IODE-XXVI.6.2](#) "IODE contributions to the UN Decade of Ocean Science for Sustainable Development (2021-2030) and establishment of an IODE inter-sessional working group". Through that Decision IODE established the IODE Intersessional Working Group (IWG) to identify the IODE contribution to the UN Decade of Ocean Science for Sustainable Development (2021-2030) with the following terms of reference:

  (i) develop an inventory of IODE data and information management assets and tools that could help serve the needs of the Ocean Decade data and information access needs;

  (ii) collaborate and coordinate with the Decade Coordination Unit (DCU) to identify gaps and scope;

  (iii) submit its report with recommendations for further action to the IODE XXVII Session.

274 Dr Garcia reported that the final report of IWG-SODIS "Proposed Data and Information Strategy for the Ocean Decade" is available in a document https://oceanexpert.org/document/27573. The vision was to recommend actionable goals to enable equitable and openly discoverable, accessible, and adaptable digital ocean data and information. This is necessary to enable the development of solution-oriented products and services by and for all countries. To accomplish this vision, the group recommended two goals: (1) Deploy a globally distributed, reliable, and interoperable high-volume network; and (2) Adopt a science-based quality requirements framework for data and information.

275 Dr Garcia also reported that the IWG-SODIS report is being used as a reference steppingstone by the Ocean Decade Data Coordination Group (DCG) to build an Ocean Decade Data & Information Strategic Plan. Dr Hernan Garcia, Mr Taco De Bruin, and others are active members of the DCG working on the strategic plan.

276 **The Committee thanked** Dr Hernan Garcia for his leadership and all the international subject matter experts that contributed to developing the IWG-SODIS plan.

277 **The Committee decided** to disband the IWG-SODIS given the new DCG effort to develop a UN Decade data and information strategic plan.

6.1.2   Establishment of the Decade Coordination Office (DCO) for Ocean Data

278 This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair. He provided a brief introduction on Decade Coordination Offices. He referred to Figure 2 available in "The Ocean Decade Series 23" (April 2021):

279 The figure shows that the DCO is hierarchically positioned just below the DCU. It oversees the work of the Decade Collaboration Centres and links with the

Figure 2: Ocean Decade Governance and Coordination Structures
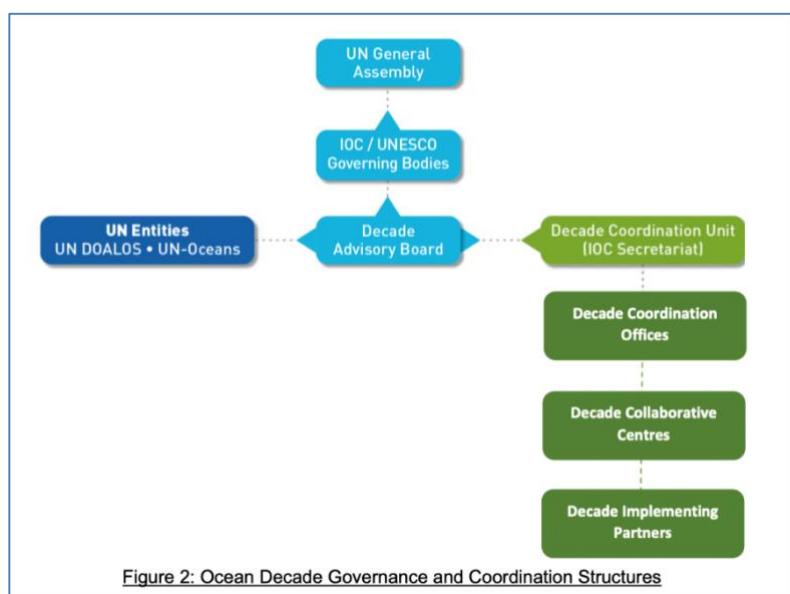
Decade Implementing Partners. It should be hosted by a UN entity and/or UN Member State acting as a host of a UN Secretariat.

280   The main roles of the DCO are: "Acts as sub-unit of the central Decade Coordination Unit. Catalysis and coordination of Decade Actions including of Calls for Decade Actions, organise and coordinate Decade review processes, promote cooperation amongst UN and Member State partners, communications, monitoring, and resource mobilisation."

281   The DCO has a geographic or thematic scope which can be an ocean basin or related to one or more Ocean Decade Challenges. In terms of expected resource commitments, the DCO should have a small team of dedicated UN staff, premises and office operational costs.

282   The IODE Co-Chairs recommended that IODE should host such an office considering the 60+ years of experience by the IODE programme and its community of oceanographic data centres in the joint management and sharing of oceanographic data. They considered that this experience can be extremely useful and beneficial towards reaching the goals of the Decade in the area of oceanographic data. Mr De Bruin noted that there should be one DCO per Decade challenge.

283   Mr De Bruin informed the Management Group that a proposal for the IODE Project Office to host a Decade Coordination Office (DCO) had been prepared and submitted to the DCU on 21 February 2022. Comments and suggestions were received from the DCU, and a final version was prepared for the consideration of the IODE MG after a consultation meeting with the DCU on 4 March, 2022 (which has been circulated to the MG members by email). The Management Group, at its meeting in March 2022, approved the proposal and decided to submit the proposal to the DCU on behalf of IODE for endorsement.

284   Mr De Bruin further explained that the DCO should have 3 staff (1 P-4 professional staff, 1 P-3 professional staff and 1 G-2 administrative staff). The total cost for 5 years (staff and operations) would be US$ 3,350,000 or US$ 670,000/year. The Secretariat was informed by the DCU that proposals can be accepted without firm resource commitments. It is understood that the DCO will only commence operations if resources have been assured.

285   The DCU approved the proposal for the IODE Project Office to host a Decade Coordination Office (DCO).

286   Mr De Bruin informed the Committee that actions are ongoing to recruit the required experts for the DCO to initiate its activities. For this recruitment, IODE and DCU are working together along two parallel paths: direct recruitment of a consultant on an 11-month contract through Ocean Decade funds; and organising meetings with IOC member state representatives to seek secondments. This resourcing activity started in January 2023 and is expected that we will have at least 1 expert recruited by April 2023.

287   Mr Jan-Bart Calewaert (Co-Chair Decade Data Coordination Group) thanked members of the IWG-SODIS for their assistance with the development of the decade data and information strategy. He announced that this document will be released shortly. The next step will be the development of an action plan and he invited IODE experts to participate in this process. He welcomed the establishment of the DCO for data sharing.

288   **The Committee welcomed** the active involvement of IODE in the UN Ocean Decade and the hosting of the Decade Coordination Office for data sharing by the IOC Project Office for IODE in Oostende, Belgium.

6.1.3   Submission of, and participation in, Ocean Decade actions by IODE

289   This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair. He recalled that IODE-XXVI had adopted Decision IODE-XXVI.6.2 (IODE CONTRIBUTIONS TO THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT (2021-2030) AND ESTABLISHMENT OF AN IODE INTER-SESSIONAL WORKING GROUP) which:

1) Decided to register OTGA, OBIS, OIH/ODIS and PacMAN as Ocean Decade Action following the procedure established for UN entities in the UN Decade of Ocean Science for Sustainable Development (2021-2030) Implementation Plan;

2) Instructed the IODE Secretariat, in close coordination with the IODE MG, to prepare the necessary documentation to register future IODE Decade Actions during the intersessional period;

3) Decided to establish the IODE Intersessional Working Group (IWG) to identify the IODE contribution to the UN Decade of Ocean Science for Sustainable Development (2021-2030) with the following terms of reference:

   (i)   develop an inventory of IODE data and information management assets and tools that could help serve the needs of the Ocean Decade data and information access needs;

   (ii) collaborate and coordinate with the Decade Coordination Unit (DCU) to identify gaps and scope;

   (iii) submit its report with recommendations for further action to the IODE XXVII Session.

290   Regarding (1) he reported that the following Decade Actions have been submitted by IODE and approved by the Decade:

- e-DNA expeditions in marine World Heritage sites (Ward Appeltans)
- Ocean Practices for the Decade (Peter Pissierssens on behalf of OBPS)
- OceanTeacher Global Academy: Building Capacity and Accelerated Technology Transfer for the Ocean Decade (Cláudia Delgado, Greg Reed, Sofie de Baenst)
- Pacific Islands Marine Bioinvasions Alert Network (PacMAN) (Ward Appeltans, Pieter Provoost)
- OceanData-2030 (Lucy Scott)
- OBIS 2030 (Ward Appeltans)

291   In addition, several proposals were submitted in cooperation with IODE:

- The World Ocean Database Programme (WODP): Openly discoverable, accessible, adaptable, and comprehensive digital global profile oceanographic data of known quality (submitted by Hernan Garcia, NCEI/NOAA, United States as a Decade contribution)
- CoastPredict - Observing and Predicting the Global Coastal Ocean (Nadia Pinardi, Italy)
- Ocean Observing Co-Design: evolving ocean observing for a sustainable future
- Marine Life 2030

292   Mr De Bruin noted that while the above projects had been included in the Decade action list this does not imply funding. Each Decade Action will need to seek funding separately. Nevertheless, it is hoped that projects identified as Decade Actions will have a higher chance of obtaining funding than if they were not so identified.

293 FAO (Mr Marc Taconet) mentioned that there are 2 Actions submitted by FAO. Mr Taconet expressed surprise with the selection process for Decade Actions. Mr Demargne (DCU) explained the process for calls and endorsement of Decade Actions. He also referred to the next call announced for 15 April focusing on Challenges 1 and 3.

294 China attaches great importance to the 2030 Agenda for Sustainable Development and the UN Ocean Decade. The Ministry of Natural Resources of China has led and coordinated the establishment of the National Committee on Ocean Decade. NMDIS, as the IODE NODC, is willing to participate in the Decade Actions under the guidance of the IODE. We have submitted the proposal to host the Decade Implementing Partnership for Blue Economy Cooperation, and will further communicate with the IODE and the IOC Sub-Commission for the Western Pacific to initiate action plans, focusing on ocean digital ecosystem of the WESTPAC, global and regional capacity development, and marine big data technology application, and so on. We appreciate IODE for its contribution to the UN Decade and look forward to cooperate with IODE in this regard.

295 **The Committee urged** IODE NODCs, ADUs and AIUs to also submit projects, preferably as IODE Actions or including IODE as a "partner" in projects.

296 **The Committee invited** the IODE World Ocean Database (WOD) project to submit a Decade Action proposal via the IODE Secretariat.

297 **The Committee requested** the DCU to keep the IODE Secretariat updated on any funding opportunities for the submitted Decade Actions and **instructed** the IODE Secretariat to update the IODE Management Group and IODE Committee on progress in this regard.

298 Regarding (2) above he reported that no action had been taken during the past intersessional period.

299 Regarding (3) above he reported that no action had been taken during the past intersessional period.

300 **The Committee instructed** the "IODE Intersessional Working Group (IWG) to identify the IODE contribution to the UN Decade of Ocean Science for Sustainable Development (2021-2030)" to focus its work on elements 2 and 3 of its terms of reference.

301 **The Committee welcomed** the numerous submissions of Decade Actions by IODE and involvement in several other Decade Actions but **called on** the DCU for pro-active action to attract funding to enable the implementation of the submitted Actions.

302 **The Committee called** for the Decade's more active participation in IODE programme elements such as ODIS, OBIS, OTGA and others as these can all contribute substantially to the data and information requirements of the Decade.

6.1.4 Other areas of cooperation with the Ocean Decade

303 This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair. Mr De Bruin informed the Committee that the DCU was planning to develop an "expert roster". The Ocean Decade Expert Roster will have the three following roles: (i) input to strategic ambition and target setting for the Ocean Decade Challenges; (ii) input to the technical review of Decade programme and project submissions to inform the deliberations of the Ocean Decade Advisory Board, and the decisions on endorsement by the IOC Executive Secretary; and (iii) input to Decade review processes, including the State of the Decade reports and discussions during the Ocean Decade Conference series. More information is available on https://www.oceandecade.org/expert-roster/.

304 Taking into account the over 20 years history of OceanExpert, the IODE Secretariat offered to adapt OceanExpert to be used also as the Decade expert roster. Several meetings were held between the IODE Secretariat and the DCU which were considered positive. It was considered that such cooperation would be mutually beneficial for IODE and the DCU and for experts it would avoid the need to register in two systems. Regrettably the Secretariat was informed in August 2022 that funding had been received by the DCU to develop a new expert roster and OceanExpert would not be used for this purpose.

305 It was noted that as funds are limited it should be preferred to make use and improve what is already existing. In addition, the sustainability of a new system beyond the Decade should be considered.

306 **The Committee expressed its disappointment** about the decision of the DCU to reject cooperation between IODE's OceanExpert and the DCU on the Decade Expert Roster **stating** that this was a missed opportunity to forge a close cooperation between IODE and the Ocean Decade.

307 **The Committee instructed** the IODE Co-Chairs to contact the IOC Executive Secretary and DCU management to inform them about the potential benefits of OceanExpert to the Ocean Decade and extend the offer again.

6.2 REVISION OF THE IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION MANAGEMENT (2022-2026)

308 This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair, referring to IOC Manuals and Guides 92 - IODE27 Draft (IOC Strategic Plan for Ocean Data and Information Management (2023-2029)).

309 He recalled that IODE-XXVI had established the inter-sessional working group to revise the IOC strategic plan for oceanographic data and information management through Decision IODE-XXVI.6.3. It was noted that the systems following the IOC Data and Information Management strategic plan will deliver: (i) interoperable, quality-controlled data on a diverse range of variables, generated according to scientifically and operationally sound methods and persistently archived in well-documented, globally applicable standards and formats, (ii) timely dissemination of data on a diverse range of variables (generated from observations and model outputs) both in real-time and delayed modes depending on the needs of user groups and their technical capabilities ("on demand" as well as automatically scheduled), and (iii) easy discovery and access to data and information about a diverse range of variables and derived products (including forecasts, alerts and warnings) by users who have a broad range of capabilities.

310 The working group, through the terms of reference defined by IODE-XXVI was given a list of 16 elements that would need to be taken into consideration.

311 The IODE Management Group, during its March 2022 meeting, had decided that no further action was required in view of the development of a Data and Information Management Strategy by the Ocean Decade's data coordination group. However, this decision was reversed in June 2022 and the working group proceeded with its work as set out on Decision IODE-XXVI.6.3.

312 Mr De Bruin further noted that the proposed strategic plan would cover the period 2023-2029 so it will cover the UN Decade of Ocean Science for Sustainable Development (2021-2030).

IODE and DCU staff will work together to ensure alignment between the IOC Strategic Plan and the Ocean Decade Data and Information Strategy

313 **The Committee adopted** Recommendation IODE-XXVII/6.2

6.3   ESTABLISHMENT OF THE IODE PARTNERSHIP CENTRE FOR ODIS

314 This agenda item was introduced by **Dr Sergey Belov,** IODE Co-Chair. He recalled that IODE-XXVI had adopted Decision IODE-XXVI.6.1.2 (REVISION OF THE TERMS OF REFERENCE OF THE PARTNERSHIP CENTRE FOR THE IODE OCEAN DATA PORTAL). The decision decided to rename the "Partnership Centre for the IODE Ocean Data Portal" to "IODE Partnership Centre for ODIS", and to revise the terms of reference of the Partnership Centre for the IODE Ocean Data Portal.

315 Dr Belov reported that events that had taken place in 2022 had made it impossible for the Partnership Centre to be established.

316 The Russian Federation informed the Committee that they will continue planning for the submission of a proposal for the hosting of an IODE Partnership Centre for ODIS (ref to 3.3.1.7)

317 **The IODE Committee**, taking into account the 2022 events and their global impact, **decided** (i) not to proceed with the establishment of the IODE Partnership Centre for ODIS during the next inter-sessional period and **(ii)** to consider this matter again at the 28th Session of the IODE Committee in 2025.

6.4   REVISION OF THE IOC OCEANOGRAPHIC DATA EXCHANGE POLICY

318 This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair. He referred to Document IOC/IODE-XXVI/6.4 (IOC Data Policy and Terms of Use (2023)).

319 He recalled that the 31st Session of the IOC Assembly (June 2021) recognized that a revision of the 20-year-old IOC data exchange policy was timely and adopted Decision A-31/3.4.2 (International Oceanographic Data and Information Exchange) including part III Revision of the IOC Oceanographic Data Exchange Policy (2003, 2019) which established the IOC Intersessional Working Group on the Revision of the IOC Oceanographic Data Exchange Policy (2003, 2019) (IWG-DATAPOLICY).

320   The Group was given the following terms of reference:
    (i)   Create an inventory of existing international, national and organizational data policies,
    (ii)   Review and compare existing international, national and organizational data policies
    (iii)   Develop a glossary with clear definitions (e.g., open vs free and unrestricted; data vs metadata vs information, licence options),
    (iv)   Investigate the expansion of scope and name of the IOC Oceanographic Data Exchange Policy,
    (v)   Gather advice from partner/sister organizations and recognized data provider/manager organizations,

     (vi)   Organize a broad consultation on the proposed revised IOC Ocean Data Policy with Member States, IOC global and regional programmes,

     (vii)   Submit a revised IOC Oceanographic Data Exchange Policy to the 32nd Session of the IOC Assembly (2023).

321   Mr Greg Reed, taking into account his long experience in IODE, was invited to complete (i) to (iii). This work resulted in Document IOC/IWG-DATAPOLICY-I/5 (Desk Study on existing data policies (IOC, UN, non-UN)).

322   Mr De Bruin reported that the working group had invited membership as instructed by IODE-XXVI and included representatives from IOC global and regional programmes (GOOS, IODE, HAB, Ocean Acidification, GOSR, Tsunami, IOCAfrica, and WESTPAC). MPR, IOCARIBE and IOCINDIO did not respond to the invitation.

323   IOC Circular Letter No. 2864 was issued on 9 November 2021 and outlined the process to facilitate the work of the IWG-DATAPOLICY and timeline.

324   The first meeting of the IWG-DATAPOLICY was held as a hybrid meeting on 5-6 April 2022. It reviewed its terms of reference and the proposed next steps and timeline. More information on the meeting is available on https://oceanexpert.org/event/3406.

325   The second meeting of the IWG-DATAPOLICY was held as a brief online meeting on 17 May 2022. It reviewed progress made with the online drafting of the new policy. The third meeting of the IWG-DATAPOLICY was held as a brief online meeting on 23 May 2022. It finalized the draft that was sent to a series of IOC/IODE partner organizations on 6 June 2022 inviting their comments and suggestions. Based upon these comments and suggestions a revision was prepared by the Secretariat which was circulated to the members of the IWG for consultation with their communities (IOC global and regional programmes).

326   As a next step an information session was organized on 21 October 2022 to present the draft policy to IOC Member States (national focal points). The event was attended by 60 participants from 18 Member States (including Member State representatives, IWG-DATAPOLICY members and IOC staff). Only a few recommendations were made for further revision of the draft policy. On 5 December 2022 the Secretariat invited the IWG-DATAPOLICY to review the revised version. No further revisions were requested by the IWG after which Document IOC/IODE-XXVI/6.4 (IOC Data Policy and Terms of Use (2023) was finalized and made available on the IODE-XXVII web site.

327   The Committee was invited to comment on the proposed policy and to consider adopting the associated recommendation for submission to the 2023 Session of the IOC Assembly.

328   **The Committee expressed its great appreciation** to the intersessional working group as well as all other experts who participated in the process leading to the new Policy.

329   **The Committee adopted** Recommendation IODE-XXVII/6.4

6.5 THE IOC OCEAN DATA AND INFORMATION SYSTEM (ODIS) - PROGRESS AND WAY FORWARD

330   This agenda item was introduced by **Ms Lucy Scott**, OIH Project Manager, referring to Document IOC/IODE-XXVII/6.5 (The Ocean Data and Information System (ODIS) - Progress and way forward).

331   She recalled that the ODIS project had been proposed by IODE-XXVI through Recommendation IODE-XXVI.6.1.1 (Establishment of the IOC Ocean Data and Information

System (ODIS) and formally approved by the 31st Session of the IOC Assembly in June 2021 through IOC Decision A-31/2.4.2-II (International Oceanographic Data and Information Exchange), (Establishment of the IOC Ocean Data and Information System Project (ODIS)). She further informed the Committee that the development of ODIS had gone hand in hand with the implementation of the Ocean InfoHub Project and the ODISCat (IOC Ocean Data and Information System Catalogue of Sources Project (ODISCat)) which had been established by IODE-XXV in 2019. Regarding ODISCat she noted that the catalogue now contains 3089 references to online sources of data and information.

332 The first session of the IODE Steering Group for the ODIS Project was held on 22 August 2022 as a hybrid event, back-to-back with the third session of the IODE Steering Group for the Ocean InfoHub Project.

333 The Ocean Data and Information System (ODIS) is a long-term solution for NODCs, ADUs and new partners to keep ownership and complete control over their data holdings, while choosing which metadata to share with a growing global ocean digital ecosystem.

334 It is noted that the "ocean digital ecosystem" concept promoted and developed through OIH/ODIS is adopted also by the UN Decade of Ocean Science for Sustainable Development and is referred to in the "Data & Information Strategy for the UN Ocean Decade" to be published in April 2023. It will furthermore be promoted by the Decade Coordination Office (DCO) for Data Sharing, that has been approved for establishment by the IOC Executive Council (2022) and will be hosted by the IOC Project Office for IODE, Oostende, Belgium. It is therefore clear that Ocean InfoHub (and the underpinning ODIS architecture) is a "trailblazer" for the Ocean Decade's ocean digital ecosystem.

335 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. The programme will play a central role in supporting the Ocean Decade mission to catalyse transformative ocean science solutions for sustainable development, connecting people and the ocean. In order to achieve the Ocean Decade vision of 'the science we need for the ocean we want'.

336 EMODnet (Mr Jan-Bart Calewaert) recognized the importance of the development of ODIS and the Ocean InfoHub project and he expressed EMODnet's strong support. He recommended that, when ODIS is fully operational, the ODIS should be renamed to "service" instead of "system" as ODIS should be a service to all data providers and users. ODIS should be a backbone if the Ocean decade and for ocean management.

337 China appreciates the establishment of ODIS and congratulates on the progress being made so far. ODIS is of great significance in the future global ocean data and information management and sharing. It will also play an indispensable role in tackling the challenges of the "Ocean Decade". Through National Marine Data and Information Service (NMDIS), China actively participates in ODIS. The data portals and data sharing nodes run by NMDIS like ODINWESTPAC, the WMO-IOC Centre for Marine-Meteorological and Ocean Climate Data, Tianjin, China (CMOC/China), China NEAR-GOOS Delayed Mode Database, China Digital Marine Library etc. are providing operational data and information service through ODIS. NMDIS is willing to continue the efforts in this field, join in the OIH and OceanData-2030 projects, supporting the development of the UN Decade digital ecosystem. Colombia and INVEMAR (as ADU), celebrate the ODIS progress and supports its role as a long-term solution for NODCs, ADUs and new partners.

338 <mark>**The Committee called on** Member States to participate in the Ocean Data and Information System (ODIS), the Ocean InfoHub Project (OIH) and OceanData-2030 to increase the visibility of their data and information holdings to the world, and to enable improved and more efficient access to global Ocean data and information.</mark>

6.6 RENEWAL OF THE MOU BETWEEN THE FLANDERS MARINE INSTITUTE AND IOC REGARDING THE IOC PROJECT OFFICE FOR IODE

339 This agenda item was covered under agenda item 7.4.1.

7. INTRODUCTION TO WORK PLAN AND BUDGET (FINANCIAL RESOURCES 2023-2025)

7.1 UNESCO REGULAR PROGRAMME FINANCIAL RESOURCES REMAINING FOR THE BIENNIUM 2022-2023

340 This agenda item was introduced by **Mr Peter Pissierssens,** IODE Technical Secretary. He reported that the funding provided to IODE from the UNESCO Regular Programme was split into approximately USD72,500 for 2022 and USD72,500 for 2023. This represents a cut of 38% compared to the previous biennium 2020-2021. He added that the organisational cost for IODE-XXVII and the Scientific Conference left very limited funds for operational expenses in 2023. Available funds from the Regular Programme for 2023 are approximately US$ 70,000.

7.2 UNESCO REGULAR PROGRAMME FINANCIAL RESOURCES EXPECTED FOR THE BIENNIUM 2024-2025

341 This agenda item was introduced by **Mr Peter Pissierssens**, IODE Technical Secretary. He informed the Committee that at the time of the Committee Session no confirmed information could be available on the funding provided to IODE from the UNESCO Regular Programme for 2024-2025 as UNESCO as a whole is at the beginning of the budgeting and programming process. In accordance with the decision of the UNESCO Executive Board, the next session in May 2023 would be invited to consider 2 scenarios (ZNG (zero nominal growth) = same budget as for 2022-2023 and BCS (Base Case Scenario) = +30M overall). Depending on the outcome of the discussion, further adjustments may be made and presented to the Board in the fall of 2023, with the final programme and budget to be adopted by the UNESCO General Conference in November 2023, as per usual process.

342 For the ZNG the Regular Programme budget available to IODE would remain at approx. US$ 70,000. The base case scenarios (BCS) could result in a substantial increase to approx. US$175,000/year-US$197,500 for 2024 and 2025, with IODE work prioritized in accordance with the vision for the sustainable delivery and expansion of core programmes proposed in the CL 2912.

343 Figure 2 (below) shows the contributions to the IODE budget from the UNESCO Regular Programme between 2004 and 2023 (and unconfirmed estimates for 2024-2027). Severe cuts were made in the 2022-2023 RP budget reducing the annual RP income to approx. US$

77,500. For 2024-2025 this could remain the same (Figure 2, based on the zero nominal growth (ZNG) scenario), or it could increase.
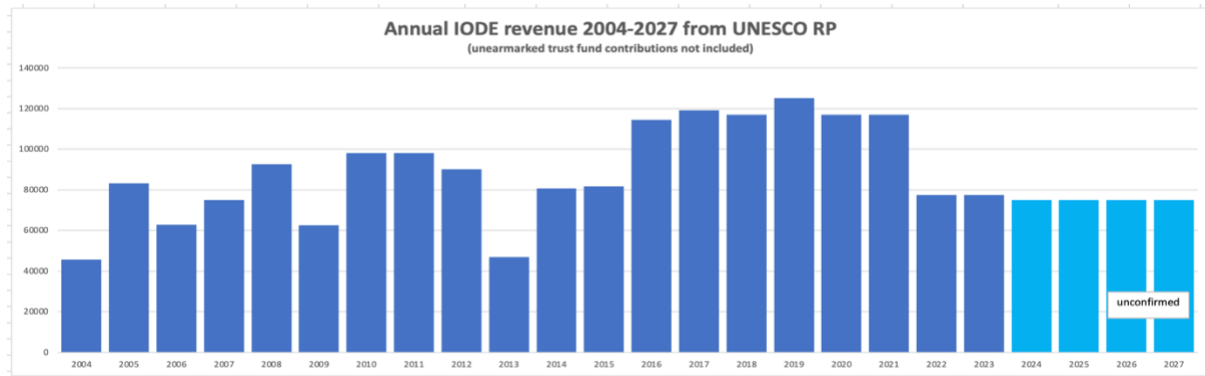
Fig 2: contributions to the IODE budget from the UNESCO Regular Programme between 2004 and 2027

344 **The Committee called** on UNESCO Member States to approve one of the Base Case scenarios **noting** that the ZNG scenario would bring IODE below the minimum level of viability.

7.3   IODE HUMAN RESOURCES (CURRENT AND REQUIRED)

7.3.1   UNESCO Regular Programme, Government of Flanders staff contribution and extra-budgetary project staff

345 This agenda item was introduced by **Mr Peter Pissierssens,** IODE Technical Secretary. He reported that IODE Project Office staff was now at a level of 14 (8 posted in Oostende, Belgium) and 6 in their home countries. An additional 2 staff are expected to be recruited in 2023.

346 He noted that Ms Cláudia Delgado, OTGA project manager, had left the IOC Project Office for IODE on 15 January 2023 and had taken up a new appointment. Her position had been advertised by the Flanders Marine Institute on 18 November 2022. Mr Pissierssens reported on progress with recruitment.

347 Mr Pissierssens introduced Figure 3 which shows the staffing situation between January 2023 and December 2026. This demonstrates a considerable uncertainty regarding staff support for IODE as from mid-2024. It also shows the unresolved staff shortages for OBIS.

Figure 3: Staffing Table IODE 2023-2026

348 **The Committee thanked** the Government of Flanders (Kingdom of Belgium) for continuing to provide three full-time staff members to the IOC Project Office for IODE and **invited** the Government of Flanders (Kingdom of Belgium) to continue this support.

349 **The Committee expressed its great gratitude** to Dr Cláudia Delgado who, as leader of the OTGA team, has turned the old training paradigm of continuous professional development (CPD) with ad hoc in-person courses taught in a classroom environment, into a vibrant inclusive hybrid environment including in-person courses held in a growing network of regional (RTCs) and specialized training centres (STCs) around the world. **The Committee** wished Dr Delgado all the best in her new position.

350 **The Committee expressed its disappointment** that, despite several requests at previous Sessions of the IODE Committee, no additional regular positions had been created and that other priorities had been decided upon.

351 **The Committee noted** that lack of stable staffing at the IODE Secretariat could seriously harm IOC and its IODE as extra-budgetary funding by IODE's main donor(s) could no longer be expected to assure the long-term sustainability of its core programme activities such as OBIS but also new IOC core activities such as ODIS, OIH, OBPS, OTGA and others.

352 **The Committee urged** the IOC Executive Secretary to provide additional staff to IODE.

7.3.2   Internships and Secondments

353 This agenda item was introduced by **Mr Peter Pissierssens,** IODE Technical Secretary. He noted with regret that no internships or secondments had been offered during the past inter-sessional period. He also referred to the results of the NODC/ADU survey which indicated that, even if secondments could be provided, they would likely be of short duration.

354 **The Committee called on** Member States, philanthropic organizations or private companies to consider seconding, either at the IOC Project Office for IODE, in Oostende, Belgium or in-kind (working from their usual place of work) in order to strengthen the IODE Secretariat.

7.4   CONFIRMED EXTRA-BUDGETARY FINANCIAL RESOURCES

7.4.1   Government of Flanders (VLIZ)

355 This agenda item was introduced by **Mr Peter Pissierssens,** IODE Technical Secretary. He informed the Committee that the Government of Flanders decided that there will "*for the time being, not be a heading 'training courses' in the IODE PO section… in the VLIZ budget*". However, the provision of three local staff members remained, together with the provision of office space. These contributions are described in the new Memorandum of Understanding, signed by the Flanders Marine Institute (VLIZ) and IOC in October 2022, covering the period January 2022 to December 2026.

356 Support by the Government of Flanders to IOC is also provided through the UNESCO/Flanders Fund-in-Trust for the support of UNESCO's activities in the field of Science. The currently supported large-scale projects include OceanTeacher Global Academy 2, Ocean InfoHub and PacMAN, and eDNA expeditions funded jointly by FUST and the general Flanders UNESCO Trust Fund (FUT). These projects will end June 2024. A FUST external evaluation will be organized in 2023 resulting in two different outcomes: (a) the assessment of the single mid-term self-evaluations produced for each above-mentioned large-scale project; (b) the assessment of the overall governance framework. The submission of the

final evaluation report will be expected by September 2023 for subsequent submission to the Government of Flanders. Depending on the outcome of the review of the projects the Government of Flanders may decide to continue its support to IOC and its IODE.

357   In September 2022 the Flanders Marine Institute (VLIZ) together with its partner organizations that include IODE, moved into a new building (Jacobsenstraat, Oostende). The IOC Project Office for IODE is located on the 6th floor of the building.

358   **The Committee thanked** the Government of Flanders (Kingdom of Belgium) and Flanders Marine Institute (VLIZ) for their support as an essential contribution to the resources needed by the IODE Programme and **called on** the Government of Flanders (Kingdom of Belgium) and VLIZ to continue their support.

7.4.2 Other

359   This agenda item was introduced by **Mr Ward Appeltans,** IODE Secretariat. Figure 3 (below) shows the different sources of revenue between 2016 and 2027. An increase in revenue from participation in European Commission funded projects is observed as from 2023. As the current FUST agreement (Flanders-UNESCO) is terminating in 2024 it is not yet known if continued funding will be obtained from this source in 2024 and beyond. As mentioned in agenda item 7.2 the figure assumes a BCS scenario for RP income for 2024-2025 and beyond. Any additional funding through the Ocean Decade is not taken into account.
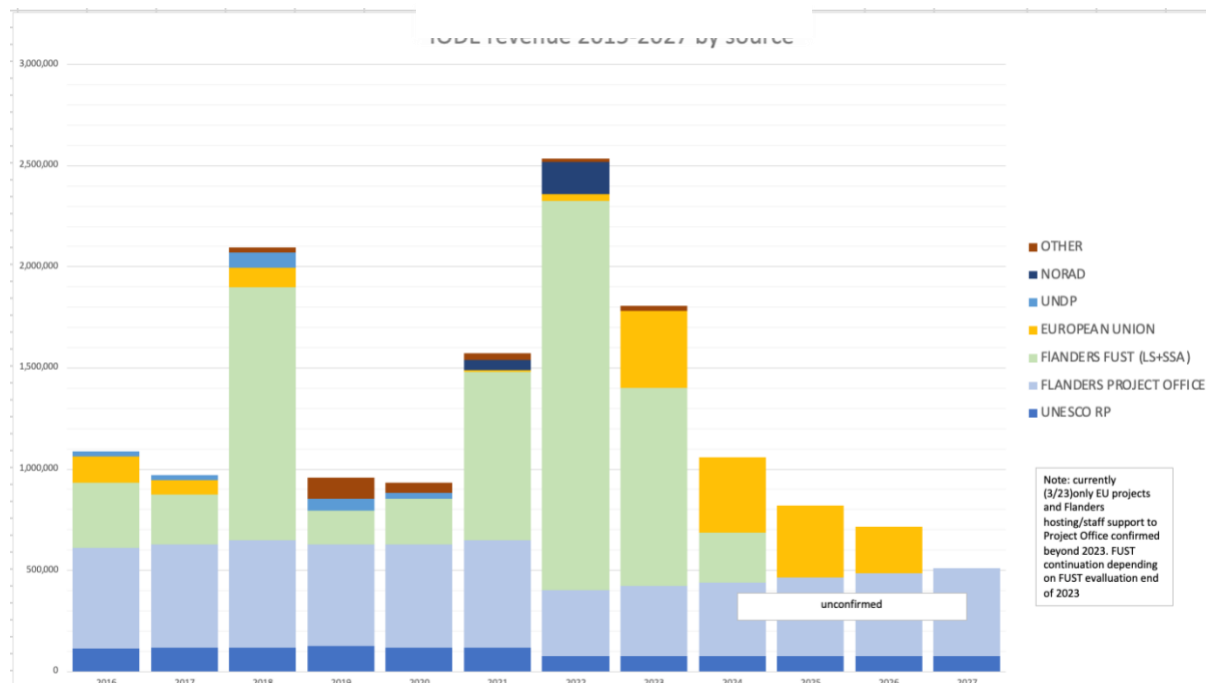
Figure 3: IODE Revenue 2016-2027 by source

360   **The Committee strongly urged** IOC Member States to follow the Government of Flanders (Kingdom of Belgium) example and establish structural funding agreements to support IODE.

361   **The Committee called on** its members and parent institutions to involve IODE in any project proposal that includes data or information management elements.

7.5   OTHER RESOURCE OPPORTUNITIES FOR 2023-2025

362   This agenda item was introduced by **Mr Ward Appeltans**. IODE Secretariat. He recalled that in 2022 funding had been received from the government of Norway through NORAD (US\$ 500,000/year for capacity development related activities) for some IODE activities. However, it was unclear if this support would be continued and at what level.

8.   PROPOSED WORK PLAN FOR THE NEXT INTER-SESSIONAL PERIOD (2023-2025)

8.1   CURRENT PROJECTS

363   This was covered under agenda item 3.3.

8.2   NEW INITIATIVES

364   This agenda item was introduced by **Mr Greg Reed,** IODE Consultant. He reported that no new projects were submitted.

8.3   IODE PROMOTION OPPORTUNITIES 2023-2025

365   This agenda item was introduced by **Mr Taco De Bruin,** IODE Co-Chair. He invited participants to identify opportunities to showcase IODE activities during the next two years (eg international conferences). The following were mentioned:
- UN Ocean Decade Conference: 10-12 April, 2024 (Barcelona): a call is expected to ocean community to propose activities, side events for the conference (which may be before, during or after the Conference)
- IMDIS: April/May 2024 (Bergen, Norway) co-organized between SeaDataNet AISBL, IFREMER and others'
- UNFCCC/COP28: 28/11-12/12 (Dubai)
- European Maritime Day: 24 May 2023, (Brest, France)
- IEEE Oceans: 6-9 June 2023 (Limerick, Ireland)
- EMODnet Open Conference: 29-30 November 2023
- 3rd Ocean Conference: 2025 (Nice, France) and mid-time conference (Costa Rica, 2024)
- EURASLIC 2023: 3-5 May 2023 (Brussels, Belgium)
- IAMSLIC 2023: October 2023 (online, Univ British Columbia, Canada)
- Ocean Sciences meeting: 18-23 February 2024 (New Orleans, USA)
- 6th world conference on biodiversity: 2-5 July 2023 (Malaysia)
- International Data Week (WDS/CODATA): October 2023 (Salzburg, Austria)
- OBPS virtual meeting: October 2023
- IEEE Oceans conference: 16-19 June 2025 (Brest, France)
- PICES annual meeting: October 2023 (Seattle, WA, USA)
- Biennial fisheries and resources monitoring system (FIRMS): 26-30 June (London, UK) and Coordinating working party on fisheries statistics, same week
- ASFA advisor board meeting: September/October, venue to be confirmed
- Annual Science Conference: 11-14 September 2023 (Bilbao, Spain)

- 5th Int. symposium on effects of climate change on the world ocean: 17-21 April 2023 (Bergen, Norway)
- 10th EuroGOOS international conference: 3-5 October (Galway, Ireland)
- Volvo Ocean Race: May/June 2023 (multiple locations)

366   **The Committee requested** that relevant events should be included in the OceanExpert calendar.

367   **The Committee invited** IOC regional offices to inform the IODE Secretariat on relevant events in their region.

368   **The Committee recommended** to the Ocean Decade Strategic Communication Group, to promote the importance of data and information inviting IODE and to join with the Ocean Decade events, among others, in which the Ocean Science community participates.

8.4   WORK PLAN AND BUDGET 2023-2024

369   This agenda item was introduced by **Mr Greg Reed,** IODE Consultant. He reported that the sessional working group for work plan and budget had prepared a work plan and budget for 2023 and 2024based on the work plans submitted by all projects and revised by the Committee based on available resources.

370   The sessional working group for work plan and budget met to review the proposed work plan and budget for 2023 and 2024. This work plan and budget has been prepared based on the work plans submitted by all projects and has been revised based on available resources. As stated by the Executive Secretary the financial situation of IOC and IODE has been at a critical level in 2022-2023. For 2024/2025 two scenarios will be presented to the UNESCO General Conference in November 2023: These are the base case and ZNG (zero nominal growth). The BCS will result in a substantial increase for IOC and its IODE while the ZNG will keep the budget at its current level. The budget table shows the two scenarios for 2024.

371   **The Committee adopted** Recommendation IODE-XXVII/8.4

372   **The Committee adopted** the work plan and budget for the next inter-sessional period and **invited** Member States to provide additional support to IODE.

9.   ANY OTHER BUSINESS

373   This agenda item was introduced by **Mr Taco De Bruin** based upon input from the Committee under agenda item 2.1.

9.1   Establishment of an Inter-Sessional Working Group on the Review of IODE Structure and Working Methods

374   This agenda item was introduced by **Mr Ariel Troisi** (Argentina). He explained that the sessional working group on the future of IODE had focused its attention on the need to review the IODE structure and working methods and to evaluate for efficacy and efficiency. In attention the sessional working group had identified the need to develop a proposal of required measures to adjust programme structure and working methods. Accordingly, the sessional working group had drafted a decision.

375   **The Committee adopted** Decision IODE-XXVII/9.1

376   <mark>The Committee instructed</mark> the Secretariat to send out a Circular Letter to invite additional members of the Inter-sessional working group on the review of IODE structure and working methods.

9.2   World Meteorological Day

377   The WMO representative (Mr Peiliang Shi) made the following statement: On this year's World Meteorological Day, as we celebrate the WMO's 150th anniversary, we are grateful for the opportunity to participate in the 27th Session of the IODE Committee and extend an invitation to all attendees to celebrate the World Meteorological Day. It is particularly poignant to note that the International Meteorological Organization, which preceded the WMO, was born out of a need to coordinate the exchange of ocean and marine meteorological data. The issues discussed at this session remain as relevant today as they were 150 years ago. We look forward to continuing our collaboration with the ocean data community, and specifically with IODE, in the future.

10.   DATE AND PLACE OF THE NEXT SESSION (IODE-XXVIII, 2025)

378   This agenda item was introduced by **Mr Taco De Bruin**, IODE Co-Chair. The Committee was invited to consider holding the meeting during the month of March 2025, taking into consideration the need to report to the IOC Assembly in June 2025.

379   Countries that would be prepared to host the next Session were kindly requested to inform the IODE Secretariat of their intention to host, not later than 12 months before the next Session dates, (i.e., before March 2024). Full information on the in-kind contributions expected from a Host are available upon request from the IODE Secretariat.

380   Colombia (Dr Francisco Arias-Isaza) informed the Committee that the next meeting of IODE coincides with a review of the UN Ocean Decade and with the anniversary of the creation of the IODE Project Office so these are important dates to celebrate and added "*As Director of Colombia ADU INVEMAR which is one of the support offices for IODE and in our opinion has developed important activities in D&IM but also because we supported OTGA and we now operate as pilot for OIH, we would initially propose to have the meeting in Santa Marta, Colombia taking into account whatever may happen in next years, and after we have received confirmation from our Government. We will do the possible to achieve this*".

11.   ELECTION OF THE CO-CHAIRS

381   The IODE Technical Secretary, **Mr Peter Pissierssens**, introduced this item by referring to the IOC Rules of Procedure (Document IOC/INF-1166), and more particularly to Rule 25, para 2. The Technical Secretary informed the Committee that, in accordance with the above Rules, the current two Co-Chairs (Dr Sergey Belov and Mr Taco De Bruin) had completed two terms and therefore were required to step down.

382   The IODE Technical Secretary then informed the Committee that IOC Circular Letter No 2885 (Call for Candidatures for the Positions of IOC Committee on International Oceanographic Data and Information Exchange (IODE) Co-Chair for the Inter-sessional period 2023–2025) had been issued on 20 April 2022.

383 Mr Pissierssens then informed the Committee on the valid candidatures received:

- Ms Lotta Fyrberg (Sweden)
- Dr Paula Sierra (Colombia)

384 **The Committee thanked** Dr Sergey Belov and Mr Taco De Bruin for their considerable contribution to IODE during the past inter-sessional periods, referring especially to the considerable challenges posed by the Covid pandemic.

385 **The Committee elected** Ms Lotta Fyrberg and Ms Paula Sierra as IODE Co-Chairs for the next inter-sessional period.

386 The incoming Co-Chairs briefly addressed the Committee.

387 Ms Lotta Fyrberg expressed her appreciation to the entire IODE Committee for the confidence it expressed by giving her the opportunity to serve as Co-Chair for the next intersessional period together with Dr Sierra. She noted that this is the first time Sweden is co-chairing the IODE Committee. She then thanked Mr de Bruin and Dr Belov for the excellent work they have done in guiding IODE over the past four years including revision of the IOC Oceanographic Data Exchange Policy and overseeing the updating of the IOC Strategic Plan for Ocean Data and Information Management and other IOC Manuals and Guides. Not only Mr de Bruin and Dr Belov made substantial work but also worked under the restrictions caused by the pandemic. She then expressed her gratitude to the IODE Secretariat for its excellent work and she looked forward to working with the Secretariat and to continuing and further expand IODE's important mission. I invited the outgoing Co-Chairs to actively continue assisting IODE and hoped she would be able to turn to them for advice. She noted that IODE's high profile and widely used global data projects, like the World Ocean Database (WOD) and the Ocean Biodiversity Information System (OBIS), must continuously be updated, developed and enhanced and the marine collaborations with WMO and GOOS further strengthened. Due to the launch of the UN Decade of Ocean Science for Sustainable Development, the spotlights are on the ocean. It is a once in a lifetime opportunity for all of us to highlight Ocean Literacy and Citizen Science in our own domains, to create "The Science We Need for the Ocean We Want". The progress of IOC Ocean Data Information System (ODIS) is vital and must be prioritized by all IODE Member States to become the global catalogue for everyone to search for continuously updated information and products. She ended by expressing confidence that the revised IOC Oceanographic Data Exchange Policy constitutes our solid foundation for future work.

388 Ms Paula Sierra then thanked the outgoing co-chairs Sergey Belov and Taco De Bruin, noting that they have made an outstanding work and put all their effort in the inter-sessional periods between 2019 to 2023, in a very challenging time with untimely and unexpected confinement by a pandemic. She thanked them for making it possible to develop the new data policy, data management strategy and for representing IODE at countless virtual and meetings relevant to our IODE community. Ms Sierra expressed her intention to help and to put all her efforts in IODE. She stated that this is an important opportunity, and noted "I'd be lying if I say I'm not somehow scared", but when thinking about the important role of data and information for the ocean science decade, as well as the many issues threatening the oceans, and even for the survival of our blue planet, she expressed her strong commitment to accept this challenge. Ms Sierra said she looked forward to promoting IODE's global and regional presence to encourage the provision, the use of data and mostly the information analysis not only for our community but also for other players to reach the sustainable development goals and to support them in front of the three drivers of environmental loss era: biodiversity loss, pollution,

and climate change. She also promised to promote training people, with emphasis on women and early career scientists, in the use of new technologies to take advantage of the benefits that information sciences has to offer for the collection of direct and indirect data, as well as to visualize, disseminate and present the data in the appropriate way for different audiences, and to attract the attention from disciplines different from ocean science, to decision-makers and to industry as supports and potential donors for IODE. We need data to be simple enough for those who require simple information, but having the scientific rigor demanded by researchers. OTGA, one of the IOC successful capacity building strategies, may be the partner we need to strengthen our efforts, especially at the regional level. She expressed her hope that we all together will be able to raise visibility and public awareness and be constantly teaching on the role of the oceans, making public and providing easy access to marine data and information using the Ocean InfoHub as the Ocean Decade information facility. If each-one of the ocean projects we might design includes a small obligation to put the data and metadata into the global information system, a huge difference will be made. She invited members of the IODE community, nothing will be possible without them, not to hesitate offering recommendations, insights and support.

389   Mr Taco De Bruin, outgoing Co-Chair addressed the Committee. He welcomed two women from different continents with excellent qualifications as the new IODE Co-Chairs. The best times of IODE are yet to come. He thanked the IODE committee and especially the IODE Secretariat staff.

390   Dr Sergey Belov, outgoing Co-Chair addressed the Committee noted that we are now going through turbulent times but we hope for a calm sea. He stated that it has been a great honour to serve as IODE Co-Chair. He expressed his deep gratitude for the trust given by the IODE community. He expressed huge thanks to the IODE Secretariat and wished success to the new Chairs. He ended by expressing his availability to help and provide advice when needed.

12.   IODE ACHIEVEMENT AWARDS 2023

391   This agenda item was introduced by **Mr Peter Pissierssens**. He recalled that IODE Sessions have been bestowing "IODE Achievement Awards" since the twentieth Session of the IODE Committee in 2009 to express special appreciation to some of these experts who contributed time and effort to the IODE programme. Between 2009 and 2021 a total of 36 awards have been given. The award ceremony was traditionally held during the session reception. A full list of awards issued during previous sessions is found on http://www.iode.org/awards .

392   Mr Taco De Bruin recalled that the IODE Management Group had decided to give the awards in 2021 "virtually" (naming the recipients) at IODE-XXVI.

393   The Management Group had also decided to issue a separate award for early career experts in data and information management. Criteria would need to be agreed upon. Mr De Bruin reported that, due to the heavy workload during the past inter-sessional period no action had been taken on this matter.

394   IODE Achievement Awards (2023) were bestowed to the following experts, who contributed exceptional time and effort to the IODE programme:

- **Mr Francisco A. Arias-Isaza**
  In recognition of his commitment and contribution to IODE in the IOCARIBE region and to the OceanTeacher Global Academy.

- **Ms Paula Cristina Sierra Correa**
  In recognition of her commitment and contribution to IODE in the IOCARIBE region through the Caribbean Marine Atlas.
- **Mr Jay S. Pearlman and Mr Johannes Karstensen**
  In recognition of their commitment and contribution to the IODE/GOOS Ocean Best Practices Project
- **Ms Cláudia M. Neves Delgado**
  In recognition of her commitment and contribution to the IODE OceanTeacher Global Academy Project
- **Ms Kristin de Lichtervelde**
  In recognition of her outstanding commitment and contribution to IODE since 2005
- **Mr Sergey Belov and Mr Taco De Bruin**
  In recognition of their leadership as IODE Co-Chairs 2019-2023
- **Mr Peter Pissierssens**
  In recognition of his service to IODE

395 **The Committee expressed its great gratitude** to the nine recipients of the 2023 IODE achievement awards **thanking** them for their exceptional contributions to continue building "our" IODE.

13. ADOPTION OF DECISIONS AND RECOMMENDATIONS

396 This Agenda Item was introduced by both Co-Chairs. The Committee was invited to adopt the Decisions and Recommendations which had been reviewed during the Session and included in the action paper.

14. ADOPTION OF THE SUMMARY REPORT

397 **The Committee requested** its Co-Chairs and the IODE Secretariat to make editorial corrections as necessary, taking into account the discussions held during the session.

398 **The Committee requested** the IODE Co-Chairs to present the Executive Summary to the Thirty Second Session of the IOC Assembly that would take place in June 2023.

399 **The Committee expressed** its great appreciation to Colombia, Russian Federation and the IODE Secretariat for proofreading and correcting the machine translations of the Action Paper.

15. CLOSURE

400 The Co-Chairs addressed the Committee. They thanked the Committee members and interpreters for their assistance during the meeting.

401 The Co-Chairs closed the Session on Thursday 23 March at 17:40.

Annex I

AGENDA

1. **OPENING**

2. **ADMINISTRATIVE ARRANGEMENTS**
   2.1. ADOPTION OF THE AGENDA
   2.2. DESIGNATION OF A RAPPORTEUR
   2.3. SESSION TIMETABLE AND DOCUMENTATION
   2.4. ESTABLISHMENT OF SESSIONAL WORKING GROUPS
   2.5. TECHNICAL ARRANGEMENTS

3. **REPORT ON THE PAST INTER-SESSIONAL PERIOD (2021-2022)**
   3.1. PROGRESS REPORT ON THE IODE-XXVI WORK PLAN (IODE-XXVI ACTION SHEET)
      3.1.1 Outcome of IOC-31
   3.2. STATUS OF THE IODE NETWORK
      3.2.1 New NODCs, accredited NODCs, ADUs, accredited ADUs and AIUs
      3.2.2 Reporting summary of NODCs, ADUs and AIUs
      3.2.3 Review of NODC health status within the IODE network
      3.2.4 Possible actions to further expand the network
   3.3. PROGRESS REPORTS OF IODE PROJECTS
      3.3.1 Global Projects
      3.3.2 Regional activities
      3.3.3 Structural Elements of the IODE Programme
      3.3.4 Rules of procedure for IODE projects
   3.4. IODE QUALITY MANAGEMENT FRAMEWORK IMPLEMENTATION
      3.4.1 Data Centre/ Information Centre accreditation: status and way forward
      3.4.2 IODE Project and activity performance evaluation: status and way forward
   3.5. PROGRESS REPORTS OF JOINT ACTIVITIES WITH OTHER IOC PROGRAMMES AND OTHER PARTNERS
      3.5.1 IOC global programmes
      3.5.2 IOC regional programmes (sub-commissions and regional committees)
      3.5.3 Post JCOMM: JCB
      3.5.4 Participation in European Commission Projects
      3.5.5 ICSU World Data System (WDS)
      3.5.6 Aquatic Sciences and Fisheries Abstracts (ASFA)
      3.5.7 Cooperation with the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC)
      3.5.8 Cooperation of IODE in the UN Ocean Decade
   3.6. OUTCOME OF THE "INTERNATIONAL OCEAN DATA CONFERENCE - THE DATA WE NEED FOR THE OCEAN WE WANT" 2022 AND 2023
      3.6.1 International Ocean Data Conference 2022 - The Data We Need for the Ocean We Want"
      3.6.2 International Ocean Data Conference 2023 - The Data We Need for the Ocean We Want"

4. **IODE CAPACITY DEVELOPMENT**
   4.1. CONTRIBUTIONS OF IODE TOWARDS THE IMPLEMENTATION OF THE IOC CAPACITY DEVELOPMENT STRATEGY
   4.1.1 OceanTeacher Global Academy project: Phase 2
   4.1.2 CD activities of other IODE projects
   4.1.3 Other potential IODE contributions towards the CD strategy

4.1.4   Reporting on the ODINs

5.   IODE COMMUNICATION AND OUTREACH
5.1   RE-DEVELOPMENT OF THE IODE WEB SITE

6.   THE FUTURE OF IODE
6.1.   IODE CONTRIBUTION TO THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT
    6.1.1   The IWG-SODIS
    6.1.2   Establishment of the Decade Coordination Office (DCO) for Ocean Data
    6.1.3   Submission of, and participation in, Decade actions by IODE
    6.1.4   Other areas of cooperation with the Decade
6.2.   REVISION OF THE IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION MANAGEMENT (2022-2026)
6.3.   ESTABLISHMENT OF THE IODE PARTNERSHIP CENTRE FOR ODIS
6.4.   REVISION OF THE IOC OCEANOGRAPHIC DATA EXCHANGE POLICY
6.5.   THE IOC OCEAN DATA AND INFORMATION SYSTEM (ODIS) - PROGRESS AND WAY FORWARD
6.6.   RENEWAL OF THE MOU BETWEEN THE FLANDERS MARINE INSTITUTE AND IOC REGARDING THE IOC PROJECT OFFICE FOR IODE

7.   INTRODUCTION TO WORK PLAN AND BUDGET (FINANCIAL RESOURCES 2023-2025)
7.1.   UNESCO REGULAR PROGRAMME FINANCIAL RESOURCES REMAINING FOR THE BIENNIUM 2022-2023
7.2.   UNESCO REGULAR PROGRAMME FINANCIAL RESOURCES EXPECTED FOR THE BIENNIUM 2024-2025
7.3.   IODE HUMAN RESOURCES (CURRENT AND REQUIRED)
    7.3.1   UNESCO Regular Programme, Government of Flanders staff contribution and extra-budgetary project staff
    7.3.2   Internships and Secondments
7.4.   CONFIRMED EXTRA-BUDGETARY FINANCIAL RESOURCES
    7.4.1   Government of Flanders (VLIZ)
    7.4.2   Other
7.5.   OTHER RESOURCE OPPORTUNITIES FOR 2023-2025

8.   PROPOSED WORK PLAN FOR THE NEXT INTER-SESSIONAL PERIOD (2023-2025)
8.1.   CURRENT PROJECTS
8.2.   NEW INITIATIVES
8.3.   IODE PROMOTION OPPORTUNITIES 2023-2025
8.4.   WORK PLAN AND BUDGET 2023-2025

9.   ANY OTHER BUSINESS

10.   DATE AND PLACE OF THE NEXT SESSION (IODE-XXVIII, 2025)

11.   ELECTION OF CO-CHAIRS

12.   IODE ACHIEVEMENT AWARDS 2023

13.   ADOPTION OF DECISIONS AND RECOMMENDATIONS

14.   ADOPTION OF THE SUMMARY REPORT

15.   CLOSURE

Annex II

IODE-XXVII DECISIONS AND RECOMMENDATIONS

DECISIONS

Decision IODE-XXVII.3.3.1.3

Underway Sea Surface Salinity Data Archiving Project (GOSUD)

The IODE Committee,

Recalling Recommendation IODE-XVI.10 that established the Underway Sea Surface Salinity Data Archiving Pilot Project,

Noting with appreciation the achievements of the Pilot Project since its establishment in 2000,

Noting that the Ocean Observations Panel for Physics and Climate (OOPC) considers sea surface salinity data as critical for the study of the decadal and longer time-scale variations associated with deep ocean overturning,

Acknowledging the continuing need to build effective international management of these data in cooperation with data providers and users to meet the requirements for temporal and spatial sampling resolution and measurement accuracy set forth by the OOPC,

Expressing appreciation to France and the United States of America for the provision of the data through the GDAC hosted by the Coriolis data centre (France) and daily back-up (permanent archived) by NCEI (NOAA's National Centers for Environmental Information).

Decides to close the Underway Sea Surface Salinity Data Archiving Pilot Project,

Decides to establish the "Underway Sea Surface Salinity Data Archiving Project" 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 decision,

Invites the IOC Member States, IODE NODCs and ADUs collecting underway sea surface salinity data to participate in the activities of the Project.

Annex A to Decision IODE-XXVII/3.3.1.3
Terms of Reference of the Underway Sea Surface Salinity Data Archiving Project (GOSUD)

Objectives of the Project: The objectives of this project are to:

(i) Acquire, quality control, store and disseminate collected underway sea surface temperature and sea surface salinity data and metadata;
(ii) Maintain the database of sea surface salinity and temperature with appropriate metadata (including safeguarding high resolution delayed data);
(iii) Maintain and improve internationally agreed data management procedures and recommended practices, including metadata schemas, through close cooperation with relevant data centres (such as NCEI, SOCAT, OceanOps, SOOP);
(iv) Maintain, improve and implement procedures for the quality assessment of real time (RT) and delayed mode (DM) data, based on the GTSPP experience;
(v) Develop or adapt already existing web interfaces to allow users to easily submit data and metadata, both in RT and DM;
(vi) Provide user access to data and metadata using state-of-the-art technologies;
(vii) Prepare proposals for the archival of additional underway data types;
(viii) Maintain a group of active experts involved in GOSUD.

Annex B to Decision IODE-XXVII/3.3.1.3
Terms of Reference of the IODE Steering Group for the Underway Sea Surface Salinity Data Archiving Project (GOSUD)

Objectives: The SG-GOSUD will have the following Terms of Reference:

1. Propose the vision, strategy, work plan and timetable for the GOSUD Project;
2. Advise on technical aspects including the GOSUD data services;
3. Establish a stakeholder forum to ensure active participation of GOSUD data end users;
4. Report to the IOC and to other partners on the progress of the GOSUD Project;
5. Identify funding sources to further develop GOSUD.

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

1. Project (Co-)Chair(s)
2. Representatives from OceanOPS,
3. Representatives of GOSUD data contributors;
4. Representatives of GDACs hosting and serving GOSUD data;
5. Invited Experts;
6. Representatives of major stakeholder (user) groups (including EMODNet Physics);
7. Representative of the IODE Secretariat;

Decision IODE-XXVII/9.1

ESTABLISHMENT OF AN INTER-SESSIONAL WORKING GROUP ON THE REVIEW OF IODE STRUCTURE AND WORKING METHODS

The IODE Committee,

Recalling IODE XXV Decision 3.2.4 on the establishment of an Inter-sessional Working Group on the Review of NODC Health Status within the IODE Network

Further recalling IODE XXV Decision 5.1 on IODE Management Structure

Noting the progress of the UN Ocean Decade for Sustainable Development 2021-2030 and the emerging demands in the field of ocean data and information as well as IODE contributions through, inter alia, the outcomes of the inter-sessional working group to propose a strategy on ocean data and information stewardship for the Ocean Decade (IWG-SODIS), the hosting of the Decade Coordination Office for data sharing by the IOC Project Office for IODE in Oostende, Belgium.

Further noting IODE contributions to UN programmes, initiatives and conventions,

Taking into account that accurate, high quality, reliable and standardized ocean data and information is the foundation of scientific knowledge and informed decision-making,

Further taking into account, and building upon, IODE XXVII Decisions in particular under agenda items 3.3.3 Structural elements of the IODE programme and 6. Future of IODE,

Considering the IODE programme is called to continue responding effectively and efficiently through appropriate structure and working methods,

Further considering the need to review the current IODE structure and working methods to ensure it remains fit-for-purpose,

Decides to establish an inter-sessional working group on the review of IODE structure and working methods, with the Terms of Reference as attached in Annex A to this Decision.

Annex A to Decision IODE-XXVII/9.1
Terms of Reference of the Inter-sessional working group on the review of IODE structure and working methods

Objectives
This working group will:
(i)   Review IODE structure and working methods and evaluate for efficacy and efficiency,
(ii)   Develop, if necessary, a proposal of required measures to adjust programme structure and working methods;
(iii) Submit its final report including a draft proposal to IODE-XXVIII.

Membership

The initial membership will include Mr Ariel Troisi, Mr Sergey Belov, Mr Taco de Bruin, Mr Francisco Arias, Ms Lotta Fyrberg, Ms Paula Sierra, Mr Kimmo Tikka, Mr Lennert Tyberghein, Mr Michael Linthon, Mr Jonathan Pye, Ms Sun Miao, Ms Fangfang Wan, Mr Marc Taconet, Mr Jan-Bart Calewaert, Mr Joon-Soo Lee, Mr Sheldon Carter, Mr Patrick Gorringe, Mr Mortaza Tavakoli and Mr Hernan Garcia.

The group will elect its Chair from the membership.
The IODE Project Office will provide secretariat support.
The working group will conduct its business electronically.

RECOMMENDATIONS

Recommendation IODE-XXVII.6.2

The IOC Strategic Plan for Ocean Data and Information Management (2023-2029)

The IODE Committee,

Recalling

(i) IOC-XXIX/6.2.2 which adopted the IOC Strategic Plan for Oceanographic Data and Information Management (2017–2021) and also agreed that the Plan should be regularly reviewed and revised by the IODE Committee, and

(ii) Resolution XXII-6 which adopted the IOC Oceanographic Data Exchange Policy,

Recognizing that

(i) the IOC Data Policy and Terms of Use is compatible with other international relevant data-exchange policies that promote free and open access to data, such as WMO Unified Data Policy,

(ii) IODE has developed a global network of National Oceanographic Data Centres, Associate Data Units, information centres and related networks, representing a considerable pool of expertise in data and information management and sharing,

(iii) many IOC Member States have developed distributed networks of data management facilities involving IODE, as well as other centres, to deal with a wide variety of ocean observations,

Considering that the vision of the IOC Strategic Plan for Data and Information Management (2023–2029) is to achieve a comprehensive and integrated ocean data and information system, serving the broad and diverse needs of IOC Member States, for management, policy-making and scientific use.

Considering further that the objectives of the IOC Strategic Plan for Ocean Data and Information Management for 2023-2029 are to deliver:

(i) interoperable, quality-controlled data on a diverse range of variables: (i) generated according to scientifically and operationally sound methods; and (ii) persistently archived in well-documented, globally applicable standards and formats;

(ii) timely dissemination of data on a diverse range of variables (generated from observations and model outputs) both in real-time and delayed modes depending

on the needs of user groups and their technical capabilities ("on demand" as well as automatically scheduled); and

(iii) easy discovery and access to data and information about a diverse range of variables and derived products (including forecasts, alerts and warnings) in a way that is user friendly for a wide variety of users.

Recommends the endorsement of the IOC Strategic Plan for Ocean Data and Information Management 2023-2029 as given in IOC Manuals and Guides No. 92.

Recommends that the Plan should be:

(i) published and distributed widely and used as a basic data strategy throughout the programmes and projects of the IOC, and

(ii) regularly reviewed and revised by the IODE Committee, in close consultation with all IOC programmes.

Recommendation IODE-XXVII.6.4

IOC Data Policy and Terms of Use (2023)

The IODE Committee,

Recalling that the IOC Oceanographic Data Exchange Policy was published in 2003 (IOC Resolution XXII-6, 2003) and since then has only had one minor change: Clause 5 revised in 2019 by Decision IOC-XXX/7.2.1(II) of the Assembly at its 30th session, Paris, 26 June–4 July 2019.

Recognizing that:

(i) the timely and unrestricted international exchange of oceanographic data is essential for the efficient acquisition, integration and use of ocean observations gathered by the countries of the world for a wide variety of purposes including the prediction of weather and climate, the operational forecasting of the marine environment, the preservation of life, the mitigation of human-induced changes in the marine and coastal environment, as well as for the advancement of scientific understanding that makes this possible,

(ii) the global digital data, information, and knowledge ecosystem has radically changed since 2003,

(iii) rapidly advancing technologies have altered the Data Stewardship paradigm,

(iv) that there is a need to improve interoperability and align the IOC data policy with those at national, regional and international levels,

(v) more and more Public-Private Partnerships are being established. To allow the best use of the data in this context as well as in the context of using data in journals from private publishers, the IOC data policy should provide clear guidance for commercial use of data.

Noting that partner and sister organizations are changing their data policies, which can serve as a model for updating the IOC data policy,

Noting further that principles of data sharing and licensing are becoming globally recognized and adopted, e.g. FAIR Principles and Creative Commons licences,

Recommends to close the IOC Intersessional Working Group on the Revision of the IOC Oceanographic Data Exchange Policy (2003, 2019) (IWG-DATAPOLICY),

Recommends the adoption of the IOC Data Policy and Terms of Use (2023) as detailed in Annex I to this Recommendation,

Decides to develop Guidelines for the development of detailed data and metadata sharing guidelines by all IOC programmes and projects.

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ANNEX I

IOC Data Policy and Terms of Use (2023)

</div>

Section 1. Preamble
The timely, open and unrestricted international sharing, in both real-time and delayed mode of ocean metadata, data and products is essential for a wide variety of purposes and benefits including scientific research, innovation and decision making, the prediction of weather and climate, the operational forecasting of the marine environment, the preservation of life, economic welfare, safety and security of society, the mitigation of human-induced changes in the marine and coastal environment, as well as for the advancement of scientific understanding that makes this possible. Metadata, data and products should be accessible, interoperable and openly shared with minimum delay and minimum restrictions.

Section 2. Purpose
The purpose of this data policy is to outline the requirements with respect to sharing, access, preservation, and attribution to facilitate the broad use and reuse of metadata, data and products.

Section 3. FAIR & CARE principles
To support knowledge discovery and innovation both by humans and machines and to acknowledge indigenous data governance, data should meet the FAIR Guiding Principles (Findable, Accessible, Interoperable and Reusable)[1] and In the case of indigenous data and information, data should meet the CARE principles (Collective Benefit, Authority to Control, Responsibility, Ethics)[2] to the greatest extent practicable.

Section 4. Conditions of use
Data should be licensed (respecting Section 8) under a minimally restrictive and voluntary common-use licence[3] that grants permission, ensures proper attribution (for example, citable using a persistent identifier) and allows others to copy, distribute and make use of the data.

Section 5. Data Repositories and the IOC ocean data and information system (ODIS)
Data should be quality controlled (using community adopted and documented best practices or standards), accompanied by complete metadata and stored in an openly discoverable and accessible long-term data repository and made available through standards-based data services. Member States shall encourage convergence and interoperability and, where possible, use IODE data centres (National Oceanographic Data Centres or Associate Data Units) or other IOC programme related data centres that share metadata and data using the IOC Ocean Data and Information System (ODIS). ODIS is an interoperability layer and

supporting technology, to allow existing and emerging ocean data and information systems to interoperate with one another.

Section 6: Secure long-term data archives

To support long-term and secure archival, data and associated metadata should be submitted, to the best practicable degree, to IODE's World Ocean Database (WOD), the Ocean Biodiversity Information System (OBIS), Global Sea Level Observing System (GLOSS), other IOC related global data archives, and data centres linked to the World Data System (WDS), their successors or other global data archives.

Section 7. Access restrictions

Data and associated metadata should be made available with minimal restrictions on use unless there are valid reasons to restrict access. Legitimate reasons to restrict access to, and reuse of, data include, *inter alia*, privacy and confidentiality, protection of species, populations or habitats of concern, and national security.

Section 8. Data sharing policies of Member States

This Policy acknowledges the right of Member States and data owners to determine the terms of metadata, data and products sharing in a manner consistent with national jurisdictions, international conventions, and treaties, where applicable.

Section 9. Data and metadata sharing guidelines

IOC programmes, projects as well as other communities of practice should develop and/or apply, where applicable, detailed metadata, data and products sharing guidelines that are consistent with this IOC Data Policy and Terms of Use.

Section 10. Definitions

'Data' is a set of values, symbols or signs (recorded on any type of medium) that represent one or more properties of an entity[4].

'Metadata' is 'data about data' describing the content, quality, condition, and other characteristics of data that allows their inventory, discovery, evaluation or use.

'Timely' in this context means the distribution of data and/or products, sufficiently rapidly to be of value for a given application.

'**Openly**' means data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and share alike.

'**Product**' means a value-added enhancement of data applied to a particular use.

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[1] Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* **3,** 160018 (2016). https://doi.org/10.1038/sdata.2016.18
[2] CARE Principles for Indigenous Data Governance. https://www.gida-global.org/care
[3] For example: the Creative Commons family of licences https://creativecommons.org/about/cclicenses/
[4] Ocean Decade Implementation Plan

Recommendation IODE-XXVII/8.4

IODE Work Plan and Budget 2023-2024

The IODE Committee,

Having reviewed its programme implementation requirements for the period 2023-2024,

Being aware of the continuing financial crisis faced by UNESCO and its IOC,

Noting with concern the continued and substantial decline in UNESCO Regular Programme funds available to IODE which has brought IODE at a critical level nearly unable to (i) implement its work plan and maintain the global network of data and information centres built over the past 6 decades, and (ii) provide capacity development at the regional level through the regional Ocean Data and Information Networks (ODINs) which will seriously impact on the equitable participation of the concerned Member States in IODE as well as in data and information management activities contributing to the Ocean Decade.

Re-emphasizing the importance of high-quality oceanographic data and information, products and services for scientific, observation and ocean-based disaster warning and mitigation programmes of the Commission, for Member States, the private sector and other users,

Noting the growing collaboration with, and contribution to other IOC Programmes and activities, demonstrated by joint development of products and services as well as capacity development activities,

Recognizing IODE's active and pro-active response to the call on IODE to contribute to the United Nations Decade of Ocean Science for Sustainable Development through several decade actions and the hosting, by the IOC Project Office for IODE, of the Decade Coordination Office for Ocean Data Sharing,

Expressing great appreciation to the Government of Flanders (Kingdom of Belgium) for hosting and supporting the IOC Project Office for IODE and for its continuing and increasing financial support to IODE as well as to other donors and Member States who are providing financial and in-kind support for IODE,

Appreciating and calling on Member States to continue (i) the in-kind support for the IODE Programme through establishing and maintaining IODE National Oceanographic Data Centres, Associate Data Units (including OBIS nodes), Associate Information Units, provision of experts; (ii) the provision of valuable ocean data and information products and services, and (iii) the provision of financial and other in-kind contributions to IODE,

Requests the IODE Co-Chairs to bring to the attention of the 32nd Session of the IOC Assembly, the IODE Programme and Budget for the period 2023-2024, as attached in the Annex to this Recommendation.

Annex to Recommendation IODE-XXVII/8.4

	Requested by IODE projects	Requested by IODE projects	scen1: 41 C/5 continued	scen1: ZNG	scen2: 41 C/5 continued	scen2: potential increase 2024-2025
	2023	**2024**	**2023**	**2024**	**2023**	**2024**
Global Projects	41 C/5	42 C/5	41 C/5	42 C/5	41 C/5	42 C/5
AquaDocs						
- WP2 tech development and maintenance (Dspace hosting and maintenance)	20,000	20,000	5,000	5,000	5,000	5,000
sub-total	**20,000**	**20,000**	**5,000**	**5,000**	**5,000**	**5,000**
GODAR					0	
- Conduct online meetings to identify historical oceanographic data sets to be added to WOD. Catalogued and prioritized data digitation requests. Identify costs to digitize relevant data within budget. Identify Crowdsourced Weather opportunities. Travel for data rescue workshops	5,000	0	2,000	0	2,000	0
sub-total	**5,000**	**0**	**2,000**	**0**	**2,000**	**0**
GOSUD					0	
Organise steering group meetings and assist to meeting that could improve GOSUD project	5,000	5,000	2,000	5,000	2,000	5,000
sub-total	**5,000**	**5,000**	**2,000**	**5,000**	**2,000**	**5,000**
GTSPP					0	
Hold in-person biennium steering group meeting - event cost	50,000	0	2,000	0	2000	0
sub-total	**50,000**	**0**	**2,000**	**0**	**2,000**	**0**
ICAN						
SG-ICAN (in person)	0	20,500	0	0	0	0
Seagrant summer scholar participation	3,500	3,500	0	3,500	0	*3,500*
Online ICAN workshop (interpretation and hosting)	12,500	0	0	0	0	0
In-person conference in conjunction w CoastGIS	0	2,000	0	2,000	0	2,000
Expert travel	4,000	4,000	2,000	2,000	2,000	2,000
sub-total	**20,000**	**30,000**	**2,000**	**7,500**	**2,000**	**7,500**
IQUOD						
Continued development of the IQuOD expert quality control tool	1,000	1,000	1,500	1,000	1,500	1,000
Workshop Berlin	15,000	0	0	0	0	0
Workshop 2024	0	15,000	0	5,000	0	5,000
sub-total	**16,000**	**16,000**	**1,500**	**6,000**	**1,500**	**6,000**
OBIS						
Two annual SG-OBIS sessions organized, report including workplan agreed and published (May 2023 and 2024), co-chair travel	25,000	25,000	12,000	14,000	12,000	14,000
OBIS training material and OBIS manual maintenance and organize regular webinars or online workshops.	60,000	60,000	0	0	0	0
Monthly OBIS QC meetings	11,000	11,000	0	0	0	0
Implement chronometric data into the OBIS platform (due May 2023).	11,000	0	0	0	0	0
Development and maintenance of the OBIS system	60,000	60,000	7000	7000	7000	7000

Establishment of new OBIS nodes	11,000	11,000	0	0	0	0
Helpdesk support to existing OBIS nodes and users	53,000	53,000	0	0	0	10,000
sub-total	**231,000**	**220,000**	**19,000**	**21,000**	**19,000**	**31,000**
OBPS						
project manager contribution (committed: 3125)	5,500	13,750	0	13,750	0	13,750
Co-Chair travel	1,500	1,000	2,000	1,000	2,000	0
AWS hosting costs			0	0	0	3,050
Secure a CORE Trust Seal Repository Certification	0	1,000	0	1,000	0	1,000
Continue efficient fit-for-purpose operations of the OBPS repository including user-required technology enhancements	8,000	3,000	0	0	0	0
Implement a user-tested automated metadata submission system	5,000	0	0	0	0	0
Design and implement machine readability of templates	0	5,000	0	0	0	0
Semantic capabilities to accommodate broader range of disciplines including contractor changes and additional vocabularies	10,000	12,500	0	0	0	0
Develop a pilot demonstration of a federated system so that queries across partner systems enable access to best-practices methodology content hosted elsewhere	0	2,500	0	0	0	0
Provide guidance to communities on process for endorsing BP / develop rigorous OBPS criteria for endorsement acceptance	2,500	0	2,000	0	2,000	0
Expanded communication plans to broaden engagement of ocean communities in creation and use of BP	2,000	1,000	0	1,000	0	0
sub-total	**34,500**	**39,750**	**4,000**	**16,750**	**4,000**	**17,800**
OCEANEXPERT						
no cost	0	0	0	0	0	0
sub-total	**0**	**0**	**0**	**0**	**0**	**0**
ODIS						
base support cost part time staff and basic operational expenses	0	0	0	0	0	45,000
sub-total	**0**	**0**	**0**	**0**	**0**	**45,000**
ODISCAT						
no cost	0	0	0	0	0	0
sub-total	**0**	**0**	**0**	**0**	**0**	**0**
ODP						
ended	0	0	0	0	0	0
sub-total	**0**	**0**	**0**	**0**	**0**	**0**
OIH						
extrabudgetary project - then part of ODIS	0	0	0	0	0	0
sub-total	**0**	**0**	**0**	**0**	**0**	**0**
OTGA						
extrabudgetary project until 6/2024 - base support cost (ex staff)	0	0	0	0	0	30,000
sub-total	**0**	**0**	**0**	**0**	**0**	**30,000**
PACMAN						
extrabudgetary project - no RP cost, ending 6/2024	0	0	0	0	0	0

sub-total	**0**	**0**	**0**	**0**	0	**0**
QMF						
no cost	0	0	0	0	0	0
sub-total	**0**	**0**	**0**	**0**	0	**0**
WOD						
continue development of WODc	50,000	50,000	0	0	0	0
sub-total	**50,000**	**50,000**	**0**	**0**	0	**0**
Regional projects						
ODINAFRICA	0	0	0	0	0	0
ODINCARSA	0	0	0	0	0	0
ODINCINDIO	0	0	0	0	0	0
ODINWESTPAC					0	
OTGA RTC Tianjin Training Course on Marine Information Technologies (May 15-26,2023, Hybrid, Tianjin, China)	30,000	0	0	0	0	0
Second ODINWESTPAC advisory group meeting (May 27,2023, Hybrid, Tianjin, China)	0	20,000	0	0	0	0
sub-total	**30,000**	**20,000**	**0**	**0**	0	**0**
Project Office general expenses						
travel cost	5,000	5,000	5,000	5,000	5,000	10,000
IT general (misc subscriptions. Domain registrations, ...) (estimated at 14000)	14,000	14,000	0	14,000	0	14,000
sub-total	**19,000**	**19,000**	**5,000**	**19,000**	**5,000**	**24,000**
IODE Management group meeting						
meeting january 2024	0	10,000	0	0	0	10,000
sub-total	**0**	**10,000**	**0**	**0**	0	**10,000**
GRAND TOTAL	**480,500**	**429,750**	42,500	80,250	**42,500**	181,300
Available (estimated: depends on cost IODE27) - status 14/3/2023			50,000	75,000	50,000	175,000
Balance			7,500	-5,250	**7,500**	-6,300

Annex III

LIST OF PARTICIPANTS

IODE Co-Chairs

Sergey BELOV
Deputy director
All-Russian Research Institute
Hydrometeorological Information - World
Data Center, Obninsk
6, Korolev St.,Obninsk,
Obninsk
Kaluga region
249035
Russian Federation

Taco DE BRUIN
Scientific Data Manager
National Marine Facilities
Koninklijk Nederlands Instituut voor
Onderzoek der Zee
PO Box 59
1790 AB Den Burg
The Netherlands

IODE Past-Chair

Yutaka MICHIDA
The University of Tokyo, Atmosphere and
Ocean Research Institute
5-1-5 Kashiwanoha
Kashiwa, Chiba
277-8564
Japan

IODE National Coordinators for data management

ARGENTINA

Ariel TROISI
Technical Secretary
Servício de Hídrografia Naval
Avda. Montes de Oca 2124
C1270ABV Buenos Aires
Argentina

AUSTRALIA

Alex LEITH
AODN Deputy Director
Australian Ocean Data Network
Integrated Marine Observing System
University of Tasmania Private Bag 110
Hobart Tasmania 7001
Australia

BELGIUM

Ruth LAGRING
Marine Data Manager
Belgian Marine Data Centre
Royal Belgian Institute of Natural
Sciences, Operational Directorate Natural
Environment, Belgian Marine Data Centre
rue Vautier 29
1000 Brussels
Belgium

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

Lennert TYBERGHEIN
Head of Data Centre
Data Centre
Vlaams Instituut voor de Zee
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

BRAZIL

Ricardo GUASTINI
Naval Attache
Directorate of Hydrigraphy and Navigation

Brazilian Navy Hydrographic Center,
Directorate of Hydrography and
Navigation
Rua Barão de Jaceguai, s/n°
Ponta da Armação - Ponta D'areia
Niteroi-Rio de Janeiro
24048-900
Brazil

CHINA

Suixiang SHI
Director-General
National Marine Data and Information
Service
No. 93, Liuwei Road
Tainjin
Hedong District, 300171
China

CROATIA

Vlado DADIC
Research,Teaching/Education
Institute of Oceanography and Fisheries
Croatia
Šetalište I. Meštrovića 63
21000 Split
Croatia

DOMINICAN REPUBLIC

Juan GONZÁLEZ
Encargado del Departamento de
Ordenamiento de Recursos Marinos
Viceministerio de Recursos Costeros y
Marinos
Ministerio de Medio Ambiente Santo
Domingo, Distrito Nacional
Santo Domingo
Dominican Republic

ECUADOR

Michael LINTHON ALVAREZ
Director of Oceanography and Marine
Meteorology
Oceanography Department

Instituto Oceanográfico y Antártico de la
Armada del Ecuador
Av 25 de julio, vía a puerto marítimo
S/N 090208
Guayaquil
Ecuador

FINLAND

Kimmo TIKKA
Senior Planner
Marine Research
Finnish Meteorological Institute
Erik Palménin aukio 1, FI-00560
HELSINKI
P.O. BOX 503
FIN-00101 Helsinki
Finland

FRANCE

Michele FICHAUT
Engineer in Data management
SISMER
Institut Français de Recherche pour
l'Exploitation de la Mer, IFREMER, Centre
de Brest
Z.I. Pointe du Diable CS10070
1625 Route de Sainte-Anne
29280 Plouzané
France

GERMANY

Susanne TAMM
Head of National Oceanographic Data
Center - Data management
Bundesamt fuer Seeschifffahrt und
Hydrographie (Federal Maritime and
Hydrographic Agency)
Bernhard-Nocht Straße 78
20359 Hamburg
Germany

GREECE

Athanasia IONA
Head HNODC
Hellenic Centre for Marine Research

(HCMR), Hellenic National Oceanographic Data Centre (HNODC)
P.O. Box 712
46.7km Athinon-Souniou avenue
190 13 Anavyssos
Greece

INDIA

Tata VS UDAYA BHASKAR
Head, Ocean Data Management (ODM)
Ocean Data Management (ODM) Division
Indian National Centre for Ocean Information Services
INCOIS, Ocean Valley, Pragathinagar (BO), Nizampet (SO)
Hyderabad 500090
Telangana
India

IRAN (Islamic Republic of)

Mortaza TAVAKOLI
Director
Directorship
Iranian National Institute for Oceanography and Atmospheric Science
Tehran,
No.3 Etemad Zadeh St.
Fatemi Ave.
014155-4781
Iran

IRELAND

Eoin O'GRADY
Information Services & Development Manager
Ocean Science and Information Services
Marine Institute Headquarters, Galway
Rinville
Oranmore
Co. Galway H91 R673
Ireland

ITALY

Alessandra GIORGETTI
Senior technical researcher

Head, National Oceanography Data Center
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Trieste
Borgo Grotta Gigante 42/C
34010 Sgonico, Trieste
Italy

JAPAN

Tatsuo KOMORI
Director
Japan Oceanographic Data Center
3-1-1 Kasumigasei, Bldg No.4,
Chiyoda-ku, Tokyo
100-8932
Japan

KOREA (Republic of)

Joon-Soo LEE
Senior Researcher
Korea Oceanographic Data Center, Ocean Climate & Ecology Research Division
Ministry of Oceans and Fisheries (MOF),
National Institute of Fisheries Science (NIFS)
216 Gijanghaean-ro, Gijang-eup,
Gijang-gun – Busan 46083
South Korea

NORWAY

Helge SAGEN
Head of Norwegian Marine Datacentre (NODC)
Institute of Marine Research (IMR),
Bergen
Nordnesgaten 50
5005 Bergen
Norway

PANAMA

Gloria BATISTA DE VEGA
Research Professor
Vicerrectoría de Investigación,
Universidad de Panamá
Panama

POLAND

Marcin WICHOROWSKI
IT manager
Polish Academy of Sciences – Institute of
Oceanology
Instytut Oceanologii Polskiej Akademii
Nauk Powstańców Warszawy 55
81-712 Sopot
Poland

PORTUGAL

Paulo NUNES
GIS Specialist
Thecnical Data Center
Instituto Hidrográfico Lisboa
Rua das Trinas, 49
1249-093 Lisboa

ROMANIA

Luminita BUGA
Senior Scientist
Oceanography
National Institute for Marine Research and
Development "Grigore Antipa"
B-dul Mamaia Nr. 300
RO-900581 Constanta 3
Romania

RUSSIAN FEDERATION

Vladislav SHAIMARDANOV
Director
All-Russian Research Institute
Hydrometeorological Information - World
Data Center, Obninsk
6, Korolev St.,Obninsk,
Obninsk
Kaluga region
249035
Russian Federation

SWEDEN

Katarina Lotta FYRBERG
Marine Data Manager
Oceanographic Unit

Sveriges meteorologiska och hydrologiska
institut
Folkborgsvägen 1
SE-601 76 Norrköping
Sweden

**UNITED KINGDOM OF GREAT BRITAIN
AND NORTHERN IRELAND**

Mark HEBDEN
British Oceanographic Data Centre
6 Brownlow Street
Liverpool
L3 5DA
United Kingdom

UNITED STATES OF AMERICA

Hernan GARCIA
Oceanographer, head WDS
Oceanography
NOAA National Centers for Environmental
Information (NCEI)
NOAA NESDIS National Centers for
Environmental Information (NCEI)
151 Patton Avenue
Asheville, NC 28801
United States

VENEZUELA

Juan CARRERA
Profesional Asociado a Investigación
Centro de Oceanología y Estudios
Antárticos
Instituto Venezolano de Investigaciones
Científicas. Centro de Oceanología y
Estudios Antárticos
Carretera Panamericana, Km. 11, Altos de
Pipe,
Caracas 20632, Caracas 1020A, Miranda
Venezuela

ADU contact points

CEFAS ADU (Centre for Environment, Fisheries and Aquaculture Science)

Laura HANLEY
Head of Data Governance and Team Leader
Applied Technology - Data Governance, Strategy and Support
Centre for Environment, Fisheries and Aquaculture Science
Pakefield Road
Lowestoft NR33 0HT
United Kingdom

Deep-sea OBIS ADU

Anke PENZLIN
Senckenberg Gesellschaft für Naturforschung
Senckenberganlage 25
60325 Frankfurt
Germany

GBIF ADU (Global Biodiversity Information Facility)

Andrew RODRIGUES
Programme Officer for Participation and Engagement
Global Biodiversity Information Facility
GBIF Secretariat
Universitetsparken 15
2100 Copenhagen
Denmark

ICES ADU (International Council for the Exploration of the Sea)

Neil HOLDSWORTH
Head of Data and Information
International Council for the Exploration of the Sea
H.C. Andersens Boulevard 44-46
DK-1553 Copenhagen V
Denmark

Lise CRONNE-GRIGOROV
Project Officer
Data and Information
International Council for the Exploration of the Sea
H.C. Andersens Boulevard 44-46
DK-1553 Copenhagen V
Denmark

INVEMAR ADU (Marine and Coastal Research Institute "José Benito Vives de Andréis")

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

ISA ADU/OBIS (International Seabed Authority)

Sheldon CARTER
Database Manager
Office of Enivronmental Management and Mineral Resources
International Seabed Authority
14 - 20 Port Royal Street
Kingston
Jamaica

MEDIN ADU (Marine Environmental Data and Information Network)

Clare POSTLETHWAITE
MEDIN Co-ordinator
Marine Environmental Data and Information Network
National Oceanography Centre
6 Brownlow Street
Liverpool
L3 5DA
United Kingdom

MedOBIS ADU

Dimitra MAVRAKI
Data manager MedOBIS
Hellenic Centre for Marine Research -
Institute of Marine Biology, Biotechnology
and Aquaculture
P.O.Box 2214
Former US Base at Gournes, P.C. 71500
municipality of Hersonissos
71003 Heraklion
Greece

**OTN OBIS ADU (Ocean Tracking
Network)**

Jonathan PYE
Director of Data Operations
Ocean Tracking Network
Steele Ocean Sciences Building -
Dalhousie University
Halifax Nova Scotia B3H4R2
Canada

**SEA-OBIS ADU (ASEAN Centre for
Biodiversity)**

Christian ELLORAN
Database Specialist
Biodiversity Information Management
ASEAN Centre for Biodiversity
Domingo M. Lantican Avenue, University
of the Philippines
Los Baños
4031 Laguna
Philippines

Project Steering Group Chairs

**GOSUD (IODE Underway Sea Surface
Salinity Data Archiving Project)**

Ludovic DROUINEAU
Engineer
Marine data manager
Institut Français de Recherche pour
l'Exploitation de la Mer, IFREMER, Centre
de Brest

Z.I. Pointe du Diable CS10070
1625 Route de Sainte-Anne
29280 Plouzané
France

**ICAN (IODE International Coastal Atlas
Network)**

Tanya HADDAD
Information Systems Specialist
Department of Land Conservation and
Development
Oregon Coastal Management Program
800 NE Oregon Street, Suite 1145
Portland, Oregon 97232
United States

**OBPS (IODE Ocean Best Practices
System)**

René GARELLO
Professor Emeritus
Institut Mines-Telecom Atlantique
Bretagne-Pays de la Loire
Technopôle Brest-Iroise
CS 83818
29238 Brest Cedex 3
France

Additional member state participants

BELGIUM

Juana JIMENEZ
International Liaison Officer
Vlaams Instituut voor de Zee
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

CHINA

Miao SUN
National Marine Data and Information
Service
No. 93, Liuwei Road
Tainjin

Hedong District, 300171
China

Fangfang WAN
Associate Researcher
Marine Data Center
National Marine Data and Information
Service
No. 93, Liuwei Road
Tainjin
Hedong District, 300171
China

Jinkun YANG
Data Management, Research Assistant
Ocean data Center
National Marine Data and Information
Service
Tianjin
Hedong District, 300171
China

COLOMBIA

Francisco ARIAS-ISAZA
General Director
INVEMAR
Instituto de Investigaciones Marinas y
Costeras José Benito Vives de Andreis
Santa Marta, Magdalena,
Colombia

CONGO (The Democratic Republic of)

Jocelyne KAZADI
Head Of Department
Marine Biology Department
Centre de Controle et Surveillance de la
Pollution Marine
7ème rue Limete Quartier Industriel
Kingabwa, Limete
Kinshasa
Congo – Kinshasa

COTE D'IVOIRE

Kouadio Hector TIACOH
Counsellor
Permanent Delegation of Côte d'Ivoire to

UNESCO
UNESCO House B14.31, B14.42
1, rue Miollis
75732 Paris Cedex 15
France

ECUADOR

Andrea HERRERA
Oceanographic Researcher 1
Gestión Ambiental Marino Costera
Instituto Oceanográfico y Antártico de la
Armada del Ecuador
Av 25 de julio, vía a puerto marítimo
S/N 090208
Guayaquil
Ecuador

César ROBALINO PONCE
Maritime Geoinformation Directorate
Instituto Oceanográfico y Antártico de la
Armada del Ecuador
Av 25 de julio, vía a puerto marítimo
S/N
090208 Guayaquil
Ecuador

Pritha TUTASI
Chief of Operational Oceanography
Division
Oceanografía Operacional
Instituto Oceanográfico de la Armada
Av. 25 de Julio Vía Puerto Marítimo, Base
Naval Sur
5940 Guayaquil
Ecuador

FRANCE

Valerie HARSCOAT
Responsable service IRSI/SISMER
IFREMER
Centre de Bretagne
ZI de la pointe du diable
CS 10070 29280 Plouzané
France

GREECE

Angelos LYKIARDOPOULOS
Head of IT Department
Hellenic Centre for Marine Research
(HCMR), Hellenic National Oceanographic
Data Centre (HNODC)
P.O. Box 712
46.7km Athinon-Souniou avenue
190 13 Anavyssos
Greece

JAPAN

Takafumi HASHIMOTO
Hydrographic and Oceanographic
Department, Japan Coast Guard
3-1-1 Kasumigasei, Bldg No.4
Chiyoda-ku, Tokyo
100-8932
Japan

Toru SUZUKI
Deputy Director General
Marine Information Research Center
Japan Hydrographic Association, 1-6-6-
6F, Hanedakuko
Ota-ku, Tokyo
144-0041
Japan

Hiroki YAJIMA
Japan Oceanographic Data Center
3-1-1 Kasumigasei, Bldg No.4,
Chiyoda-ku, Tokyo
100-8932
Japan

KOREA (Republic of)

Kwang-Young JEONG
Senier Researcher
Ocean Research Division
Ministry of Oceans and Fisheries, Korea
Hydrographic and Oceanographic
Administration
#351, Haeyang-ro, Yeongdo-gu
Busan 49111
South Korea

MEXICO

Rebeca MIRANDA CASTAÑEDA
Deputy Director of Analysis
Institute's Presidency
The National Institute of Statistics and
Geography
Avenida Patriotismo 711
03730 Mexico City, Mexico City
Mexico

PANAMA

Elia Del Carmen Guerra Jurado
Ambassador, Permanent Delegate
Permanent Delegation of the Republic of
Panama to UNESCO
UNESCO House B12.37
1, rue Miollis
75732 Paris Cedex 15
France

Paola Gómez Barletta
Second Secretary, Deputy Permanent
Delegate
Permanent Delegation of the Republic of
Panama
UNESCO House B12.37
1, rue Miollis
75732 Paris Cedex 15
France

RUSSIAN FEDERATION

Igor IVACHEV
Director
State Oceanographic Institute
6 Kropotkinsky Lane
Moscow
119034
Russian Federation

Galina ENYAEVA
Second secretary of the Permanent
Delegation of the Russian Federation to
UNESCO
Paris, France

SENEGAL

Awa Bousso DRAME
Coastal Geoscientist - Founder CEO of
Coastal & GISciences Research Institute
(Senegal)
University College London, Coastal &
Estuarine Resarch Unit, London, United
Kingdom
University College London, UK & Coastal
& GISciences Research Institute, Senegal
Gower Street, London, UK
Rue Joseph Gomis, Dakar, Senegal
00000 London & Dakar
Senegal

SWEDEN

Patrick GORRINGE
International Ocean Relations and
Contracts
Sveriges meteorologiska och hydrologiska
institut
Folkborgsvägen 1
SE-601 76 Norrköping
Sweden

SYRIAN ARAB REPUBLIC

Adib SAAD
Director
Marine Sciences Laboratory-
Fac.Agriculture
Tishreen University
P.O. Box 1408
Lattakia
Syria

UNITED STATES OF AMERICA

Ann-Christine ZINKANN
Program Manager
Oceanic and Atmospheric Research
National Oceanic & Atmospheric
Administration, Silver Spring
1315 East-West Highway
Building 3, Room 2830
Silver Spring, Maryland 20910
United States

VENEZUELA

Héctor DE ABREU DE ABREU
Maestría
Dirección Naval de Apresto Operacional
Armada Nacional de Venezuela
Final Av. Vollmer, Edif. Comandancia
General de la Armada Bolivariana Urb.
San Bernardino
Caracas 1010, Distrito Capital
Venezuela

Gregoria DÍAZ
Bióloga
Centro de Datos Oceanográficos
Servicio de Hidrografía, Oceanografía,
Meteorología y Cartografiado Náutico de
la Armada Bolivariana de Venezuela
Urb. Playa Grande, Parroquia Urimare,
entre Calle 8 y 9
Catia La Mar 1162, Vargas
Venezuela

Rafael DÍAZ
Jefe Operacional
Jefatura Operacional
Servicio de Hidrografia Oceanografia y
Cartografiado Nautico
Servicio de Hidrografía, Oceanografía,
Metorología y Cartografiado Náutico,
Catia la Mar, Estado la Guaira
Catia La Mar , La Guaira
Venezuela

Darwin GONZALEZ
Direccion de Recaudacion
Servicio de Hidrografia Oceanografia y
Cartografiado Nautico
Complejo Naval de Maiquetia, Calle los
Baños
maiquetia 1161, la guaira
Venezuela

Andres GUERRERO
Jefe de la División de Hidrografía (Servicio
de hidrografía, Oceanografía,
Meteorología y cartografiado Náutico)
Hidrografía y Oceanografía
Servicio de Hidrografía, Oceanografía,

Meteorología y Cartografiado Náutico de
la Armada Bolivariana de Venezuela
Urb. Playa Grande, Parroquia Urimare,
entre Calle 8 y 9
Catia La Mar 1162, Vargas
Venezuela

Other organizations

**Convention for the Protection of the
Marine Environment of the North-East
Atlantic (OSPAR)**

Christopher MOULTON
Data Administrator
OSPAR Commission
The Aspect
12 Finsbury Square
London
EC2A 1AS
United Kingdom

**European Association of Aquatic
Sciences Libraries and Information
Centres (EURASLIC)**

Sofija KONJEVIC
Library Adviser
Center for scientific information
Rudjer Boskovic Institute, Library Zagreb
Bijenicka cesta 54
10000 Zagreb
Croatia

**European Commission - DG Maritime
Affairs and Fisheries (DG MARE)**

Zoi KONSTANTINOU
Policy Officer - Marine Knowledge
DG MARE, Unit for Maritime Innovation,
marine knowledge and investment
European Commission J-79, DG Maritime
Affairs and Fisheries
Rue Joseph II 99
07/44
1049 Brussels
Belgium

**European Marine Observation and Data
Network (EMODnet)**

ENODnet Secretariat

Jan-Bart CALEWAERT
Head of the EMODnet Secretariat
European Marine Observation and Data
Network (EMODnet)
Secretariat of the European Marine
Observation and Data Network
(EMODnet)
Wandelaarkaai 7
8400 Oostende
Belgium

EMODnet Geology

Anu KASKELA
Geologist
Environmental Solutions
Geological Survey of Finland
P.O. Box 96
02151 Espoo
Finland

Henry VALLIUS
Senior Scientist
Marine geology
Geological Survey of Finland
P.O. Box 96
Vuorimiehentie 5
02151 Espoo
Finland

EMODnet Seabed Habitats

Fergal MCGRATH
Survey Team leader
Advanced Mapping Services
Marine Institute Headquarters, Galway
Rinville
Oranmore
Co. Galway H91 R673
Ireland

EMODnet Biology
Lennert Tyberghein (see IODE National
Coordinators for data management list)

EMODnet Chemistry
Alessandra Giorgetti (see IODE National Coordinators for data management list)

EMODnet Physics
Patrick Gorringe (see Additional member state participants list)

EMODnet Ingestion
Athanasia Iona (see IODE National Coordinators for data management list)

EuroGOOS AISBL

Vicente FERNÁNDEZ
Science Officer
EuroGOOS AISBL
Rue Vautier, 29
1000 Brussel
Belgium

Inga LIPS
Secretary General
EuroGOOS AISBL
Rue Vautier, 29
1000 Brussel
Belgium

Food and Agriculture Organization of the United Nations (FAO)

Marc TACONET
Chief, FAO Fishery statistics and information Branch
Fisheries and Aquaculture Department
FAO Food and Agriculture Organization of the UN, Headquarters
00153 Rome
Italy

Fugro

Emma KILCOYNE
Management trainee
Sustainability
Fugro NV
Veurse Achterweg 10
2264 Leishchendam
Netherlands

Terry MCCONNELL
Director - Analytics and Cloud Automation
UN Decade Data Coordination Platform
Fugro NV
Veurse Achterweg 10
2264 Leishchendam
Netherlands

GOOS Observation Coordination Group (OCG)

Kevin O'BRIEN
Senior Research Scientist
Joint Institute for the Study of the Atmosphere and Ocean
University of Washington
24 Kincaid Hall
Seattle, WA 98159
United States

International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC)

Jennifer WALTON
Library Services Coordinator
MBLWHOI Library
Marine Biological Laboratory
7 MBL Street Woods Hole MA
United States

North Pacific Marine Science Organization (PICES)

Jeanette GANN
Oceanographer
National Marine Fisheries Service
National Oceanic and Atmospheric Administration/Alaska Fisheries Science Center
17109 Pt Lena Loop Road
Juneau, Alaska 99801-9466
United States

SeaDataNet AISBL

Serge SCORY
Head of the Belgian Federal Oceanographic Data Centre (BMDC)

Royal Belgian Institute of Natural
Sciences, Operational Directorate Natural
Environment, Belgian Marine Data Centre
rue Vautier 29
1000 Brussels
Belgium

SINTEF Ocean

Ute BRÖNNER
Senior Project Manager, Research
Scientist
Cimate & Environment
SINTEF Ocean
Postboks 4760 Torgarden
7465 TRONDHEIM
Norway

Southern Ocean Observing System (SOOS)

Petra TEN HOOPEN
Scientific Data Manager
UK Polar Data Centre
British Antarctic Survey
High Cross
Madingley Road
Cambridge
CB3 0ET
United Kingdom

UK G7

Katy HILL
UK G7 Marine Science Co-ordinator
National Oceanography Centre,
Southampton
European Way,
Southampton
SO14 3ZH
United Kingdom

World Data System (WDS)

Meredith GOINS
World Data System International
Programme Office
420 Communications Bldg
1345 Circle Park Drive

Knoxville, TN 37996
United States

World Meteorological Organization

David BERRY
World Meteorological Organization
Case Postale 2300
7bis, avenue de la Paix
CH-1211 Geneva
Switzerland

Peiliang SHI
Director
WIS/OBS
World Meteorological Organization
Case Postale 2300
7bis, avenue de la Paix
CH-1211 Geneva
Switzerland

Invited experts

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

IODE staff

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

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

8400 Oostende
Belgium

Kristin DE LICHTERVELDE
Administrative Services Manager
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

Arno LAMBERT
IT Services Manager
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

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

Greg REED
IOC consultant
UNESCO / IOC Project Office for IODE
Based in Sydney, Australia
Belgium

Lucy SCOTT
Ocean InfoHub Project Manager; Marine
Scientist
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1
8400 Oostende
Belgium

Pauline SIMPSON
IOC Consultant
UNESCO / IOC Project Office for IODE
InnovOcean Campus
Jacobsenstraat 1

8400 Oostende
Belgium

IOC staff

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

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

Emma HESLOP
Programme Specialist GOOS
Intergovernmental Oceanographic
Commission of UNESCO
7, place de Fontenoy
75732 Paris cedex 07
France

Kirsten ISENSEE
Programme Specialist - Ocean Carbon
Sources and Sinks
Ocean Science Section
Intergovernmental Oceanographic
Commission of UNESCO
7, place de Fontenoy
75732 Paris cedex 07
France

Vinicius LINDOSO
Digital Communications / Web Editor
Intergovernmental Oceanographic
Commission of UNESCO
7, place de Fontenoy
75732 Paris cedex 07
France

Vladimir RYABININ
IOC Executive Secretary
Intergovernmental Oceanographic
Commission of UNESCO
7, place de Fontenoy
75732 Paris cedex 07
France

Annex IV
Summary report of IODC-II

International Ocean Data Conference - II (IODC-II)
20-21 March 2023
UNESCO Headquarters, Paris, France

The Data We Need for the Ocean We Want

The goal of IODC-II was to focus on the implementation of the commitments and main recommendations identified at IODC-I, and therefore was organized around four sessions following those recommendations.

Session 1

IMPLEMENTING THE FAIR AND CARE PRINCIPLES FOR OCEAN SCIENCE AND SUSTAINABLE DEVELOPMENT

Context summary

- Presentations showcased **approaches/methods/tools to assess and improve FAIRNESS levels and concrete examples on implementations of the FAIR and CARE Principles** across communities.

- The **initiatives/activities presented were very diverse**, ranging from very broad and substantial efforts to assess FAIRness and implement improvements across different actors/infrastructures/systems - up to projects/work focussing on more specific issues, challenges and/or data types

- Focus **included efforts to optimize, standardize, and/or harmonize digital assets or methods and practices** *in line with the FAIR and CARE principles*. Questions raised were:

  - What were the **challenges** encountered and which **solutions** were applied?

  - **How can the lessons learned be transferred?** How can the tools be applied by others?

Highlights/Observations

- A lot of **very valuable work done/ongoing** on developing/adapting/implementing approaches to assess and improve FAIR&CAREness levels of the data and information systems in different regions/communities.

- **Approaches**/tools used/developed **vary depending on context**, **types of data**/information being shared, different **technologies** in place, …

- The **understanding** and **importance** given to FAIR/CARE principles **varies greatly across different communities**: e.g. for **Industry**, there is still a long way ahead, and main challenge is to change the culture/practices. As such, key factors that influence readiness to FAIR-ify data resources are *motivation, knowledge, capacity/resources, incentives.*

- Despite progress across the different platforms and activities, there is **still a lot of work needed to improve accessibility, searchability and discovery, and interoperability** of data.

- Increasing attention **to Machine-2-Machine (M2M) interoperability** (e.g ENVRI FAIR: Most Research Infrastructures were FAIR for users but not for machines) *is essential to deal with the growing volumes of data and ensure that all the components can interact efficiently with each other and can ensure a smooth/efficient data flow across the components.*
- **ERDDAP came up as a very useful interoperability tool**, deployed for example by MRIs, but also in major distributed data infrastructures (e.g. WOD, EMODnet) to broker between data providers and users providing flexibility in data formats.

Specific Recommendations

- The community should continue investing on **developing systematic data integration services** // Importance to create **rich and consistent metadata models** [SimonsCMAP]
- Sharing data does not mean it is FAIR! **Formats are important, as well as providing APIs in combination with rich metadata** to enhance data discovery & harvesting [ASFA]
- **Connection across communities** with different levels of technological maturity is important, to **enhance capacity building** [ASFA]
- **Controlled vocabularies** are important to reach harmonised FAIR data [ASFA]
- **Terms Of Use/licensing**: recommended to keep as open as possible - CC BY and the removal of restrictions to data unless it is absolutely essential [EuroGOOS Data Policy]

High Level Recommendations

- Need to **ensure that lessons learned, approaches/methods applied** to assess & improve FAIR/CAREness of the data and infrastructures are **well documented and shared** with other communities in a way they can use it (language/etc), with information or transferability to other sectors/systems and limitations → **where/what/how?**
- Across FAIRness implementation activities, there is always a **strong need to communicate/educate/train** those who collect data and/or operate data management/sharing infrastructures → **which mechanisms can we use to improve ocean data literacy?**
- There is a **need to improve searchability** (at various levels) for what data and information resources are already available/existing → **which tools/platforms to use (at global level)?**
- There are already **many global initiatives and platforms which can be used** for this - Ocean Best Practices (**OBPS**) repository // Ocean Data and Information System (**ODIS**) - ocean infohub (**OIH**) and **ODIS-CAT** // Ocean Teacher Global Academy (**OTGA**). And many more…
  - **These should be further developed/strengthened/promoted** and lifted up to be more used and fully reach their potential
  - **A shared responsibility**: in order for these platforms/services to be useful to them, communities of practice also need to contribute to them (they need to be supported/populated/ingested, …)

Session 2

COMMUNITY ENGAGEMENT AND CAPACITY DEVELOPMENT IN DATA LITERACY

Highlights

- In summary, Session 2 provided how much progress was made in improving data literacy and increasing engagement of communities which contributed to addressing barriers in ocean science capacity and participation.
- We learned about how initiatives such as the training of fishermen in Varna and the fishermen weather field school in Sulawesi contributed towards improving data collection processes, and instilling motivations on voluntary participation of fishermen, not only as targeted users but also as contributors to the marine data observation team. The inclusion of new entrants contributed to the improvement of modeling and prediction process in Varna that expand the possibilities for predicting the ocean.
- Enhanced access to scientific data, tools, methodologies, various training opportunities and knowledge exchange series such as those made possible through GEO, OTGA, Ocean Data Connector, Ocean Data BootCamp, and Fundacion Caribe Sur contributed to digital literacy and building local stakeholders capacity.
- The co-design approach in the stakeholder-led PacMAN project development in Fiji demonstrated the importance of embedding capacity development elements from project design to implementation, which contributed to the successful engagement of local communities and sense of ownership.
- Finally, innovative approaches in developing data information products such as the SeaWatcher App allow capturing people's imagination while contributing to increased sighting records. It presents win-win solutions where both providers and users of data information products collaborate and mutually benefit from upskilling while also contributing to marine data collection.
- These efforts catalyze a good progress toward sustainable use of our ocean.

Recommendations

Although we can say that there is good progress made, some challenges remain and without on-going engagement, especially of diverse user communities, projects will not lead to long-term benefits. Therefore, the conference recommended to:

- **Improve cooperation mechanisms for multi-stakeholder partnerships, especially between scientific and educational institutions**. This is specially true when we discuss about the role of education and how collaboration with educational institutions can help not only in training and mentoring of early career professionals, but also in inculcating more positive perception and awareness about the ocean and ocean related careers. And this can start as early as primary schools, in collaboration with aquariums, museums and other related institutions. Perhaps many of us are now active in the ocean domain because of an interest in the ocean that was awaken from a specific experience when we were young.

- **Innovative and creative approaches especially on outreach and communication strategies to reach wider potential user communities**, such as the youth, indigenous groups, non-technical community groups and specific stakeholder sectors. All the high technical knowledge and background on ocean data can be intimidating especially for

non-technical communities outside of professional ocean networks with no background or training in ocean science. Thus the need for innovative and creative ways to break down complex, difficult concepts into intuitive, human-friendly models or creative channels that can entice stakeholders to be motivated in participating and contributing to our common goals especially when there is guidance and support available to specific stakeholder groups.

- **Enhanced documentation of experiences and promoting best practices on community engagement and empowerment**. Other than replication purposes, best practices can also support communities' engagement and interoperability through sharing broadly the same baseline of understanding and references from respective communities of practice.

- **Embed capacity development through transdisciplinary approaches and co-design from project conceptualization to implementation.** This is critical to ensure that existing capacity and resources are considered in project designs and their capacity development needs are embedded and addressed in every stage as part of the project outcomes and deliverables.

The UN Ocean Decade provides an enabling framework to facilitate this multi-stakeholder collaboration, technology transfer and capacity development.

Session 3

GLOBAL OCEAN DIGITAL ECOSYSTEM

Summary

This session featured examples of digital ecosystems, their components, as well as technologies to aid in their creation, operation, and application to sustainable ocean management.

- Localised digital ecosystems for nations, regions, and industry sectors are emerging, consolidating data and services for their stakeholders and their priorities.
- Thematic hubs are gathering and QCing data for specific challenges (ocean acidification, oxygenation, etc) for relay to defined stakeholders (e.g. EOV portals, SDG process).
- Tools to navigate, interact with, and communicate more effectively across and within digital ecosystems were presented.
- Digital twins and their internal digital ecosystems are working towards twin-twin interoperability, and interoperability with non-twin data streams and data lakes.
- **Well-defined interfaces to channel ocean data into the SDG process are emerging.**

Highlights/Observations

- This small sample of rapid progress and innovation shows how much capacity exists, but also shows that we must do better in interlinking these capacities globally.
- We are realising that having interoperability technology and local/regional standards/FAIRness is not enough - we must demonstrate interoperability with many independent counterparts and co-develop stable, co-governed exchange, conversion, and interoperation conventions.

- Discovering and operating in the right "niche" in the *global* ecosystem is key - (meta)data flows and service interaction should be clear, and verifiable in real-time, with each step adding value along clear digital value chains with identified stakeholders.

- New technologies to allow the mapping, monitoring, interactivity, and referencing of components and activities within the ocean digital ecosystem are needed and emerging. *"You should not need to know where (exactly) to look to find what you're looking for"*

- Parallel activities are inevitable: we must align and harmonise early through international fora provided by the appropriate communities, such as RDA, IODE, CODATA, and others.

- Clear pathways into official SDG indicator reporting / assessment mechanisms must be secured for each ocean-relevant SDG.

Recommendations

- **Foremost, coordination, co-governance, and continuous testing of digital interoperability norms is needed at all levels of the ocean digital ecosystem**
  - Consensus building is hard, but when it works, it multiplies effectiveness.
  - The DCOs, DCCs, and similar mechanisms should dovetail recommendations with those of OGC, RDA, ISO, TDWG, and other prevailing standards organisations - we need to evolve what's there, not build new "standards and best practices" when they're not needed.
  - We should have clear, common, and computable maps of data and service flows, so we're all on the same page and can resolve niche crowding or gaps.
- **We must update our metrics for success: how well new components (large or small) are embedded within the ocean digital ecosystem is key**
  - When each regional, national, thematic, or other digital system can federate queries/responses to others in one go, we're transforming the game.
  - One stop shops are useful, but globally accessible digital supply chains are more valuable to more stakeholders.
- **The Decade Data & Information Strategy will focus on the engineering of a global digital ecosystem**
  - As potential/actual co-implementers, we should rally and challenge this strategy and the implementation plan that will emerge over the next year.

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Session 4

INTERDISCIPLINARITY, SOCIETAL NEEDS

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For the 4th session we invited presentations that illustrate efforts to create integrated and interdisciplinary ocean data systems that address specific societal needs. The speakers demonstrated concrete links to societal actors which rely on a large variety of data, including socio-economic data, to make decisions and management plans.

Highlights

- Creating and sharing data and questions around monitoring, digitalisation, infrastructures, and the interoperability of existing databases have become central issues to ocean science and governance.

- Ocean data is typically produced, owned, managed, and used by diverse actors, including government agencies, universities, research labs, oil and biotech companies, the fishery sector, international organisations, and museums. These different actors engage in diverse data practices, which lead them to "encounter many of the typical barriers to data sharing and integration".
- Countries are inadequately equipped to manage their ocean data and information, which hampers open access and data sharing. In addition, the capacity to access and use ocean data is limited, leading to information asymmetries and disparities between actors' ability to influence policy.
- Qualitative research with scientists or database managers can be crucial to assessing underlying needs, values, and norms that shape data-related practices.
- A multi-stakeholder co-design process, led by a key stakeholder, can ensure a more holistic approach and importantly adds transparency and builds trust.
- Coastal engineering requires more and more high resolution/high accuracy (Open source) data, over long time periods (both metocean data, in-situ parameters, geospatial datasets, surveys). Despite small scales data collection activities for research or engineering studies purposes, collecting data is the first barrier in West Africa before focusing on data standardisation, management and sharing.
- Oceans' Underwater Cultural Heritage is part of the history of all civilizations. It is the testimony of all users of the oceans. It touches people and therefore can help facilitate the dialogue with stakeholders and can help us deal with the challenges that the ocean may face in the future.
- Historical data provide important knowledge on the role of humans in shaping the ocean. Marine life, especially whales, has played an important role in societal development and how selected socio-economic, cultural and environmental forces have limited as well as enabled marine exploitation.
- The "*marriage*" of Art & Science, especially Artificial Intelligence, virtual and augmented reality, can help create more impact, raise awareness, inform, and educate the public, especially the young hyper-connected generations. It can help create a positive change of hope for a more collective and sustainable future.
- Managing marine pollution data is extremely challenging due to the need of collecting and giving access to detailed methodological information (e.g. analytical methods, QA/Qc procedures,...) and it requires consolidated dialogue with user communities (also beyond the scientific community) to better address societal needs.
- Safety and Surveillance at sea are important elements of Marine Spatial Planning (MSP), and should be included in MSP decision support tools. If safety aspects are not well considered, accidents might happen which can lead to pollution and human lives will be at risk.
- Deploying data synthesis routines and improved data processing/integration workflows can change how ocean data infrastructures are accessed, utilised, augmented, and transformed, to inform the data and knowledge that are required to compile ocean accounts, towards achieving integrated ocean planning and effective decision making.
- Socio-economic data are an important asset to support decision-makers, private companies, and scientists in planning human activities in marine areas. However, they are still mostly missing or limited to descriptive information.
- The submarine telecom networks can be a powerful way to collect data from the ocean.

Recommendations

- There is a need for **reflexive, policy-relevant, and engaged ocean science**.
- The conference calls for **more inter- and transdisciplinary research practices, ensuring more diversity, transparency, equity, inclusion and trust**, which are necessary to bring transformational change to our society.
- Efforts **to improve ocean data use require social sciences' support** to analyse user needs and how different actors with different data practices can best collaborate,

integrate their knowledge, and **avoid injustices and discrimination.** Social sciences should assess underlying needs, values, and norms of scientists or database managers that shape data-related practices, and these qualitative insights may be fruitfully aligned with insights from quantitative analyses of data usages and information flow patterns at larger scales.

Annex V

IODE-XXVII Action Sheet

Para number	Action item	Deadline	Implemented by
34	The Committee called on NODCs and ADUs to apply for accreditation as a "quality seal" demonstrating that the data services provided are of the highest quality standards	continuous	NODCs, ADUs
35	The Committee stressed the importance of hosting an NODC and urged IOC Member States that have not yet established an NODC to do so to ensure their ocean data are shared globally and that their national ocean scientists have easy access to the global ocean data commons.	continuous	IOC Member States
36	The Committee stressed the importance of hosting an AIU and urged marine libraries and information centres that have not yet established an AIU to do so to ensure their ocean information is shared globally and that their national ocean scientists have easy access to the global ocean information commons.	continuous	Marine libraries and information centres
37	The Committee invited accredited NODCs, ADUs and AIUs to provide assistance and mentoring services to other NODCs, ADUs and AIUs that wish to apply for accreditation	continuous	Accredited NODCs, ADUs, AIUs
45	The Committee instructed the Secretariat to further investigate this matter [*decrease in data centres that report a data discovery portal*] and invited data centres to establish data discovery portals	IODE-XXVIII	IODE Secretariat
54	The Committee noted the slow progress on the IODE data centre health check procedures, although a short progress report has been made available very recently, decided to extend the "Inter-sessional working group on the review of NODC health status within the IODE network" for another inter-sessional period and instructed the working group to (i) provide a status report on the procedures to the IODE Management Group (2024); and (ii) finalize the procedures for submission to the 28th Session of the IODE Committee (2025).	IODE-MG 2024 and IODE-XXVIII	IWG review NODC health status
55	The Committee instructed the IODE Management Group to take into account the procedures used by the SG-OBIS as a possible model in their deliberations.	IODE-MG 2024 and IODE-XXVIII	IODE MG
57	The Committee further decided that, once a year, the IODE Secretariat should send out an IOC Circular Letter to all IOC Member States, inviting them to designate or update information on IODE national coordinators (data management and information management) and update the list on the IODE web site	End 2023, end 2024	IODE Secretariat
67	The Committee noted with regret the continuing small number of IODE Associated Information Units (AIUs) and requested a concerted recruitment effort be made to increase the	continuous	IODE Secretariat, ASFA, IAMSLIC

	number before IODE-XXVIII in close collaboration with ASFA and IAMSLIC.		
68	The Committee invited information centres, marine libraries and librarians as well as professional organizations such as IAMSLIC and ASFA to collaborate with IODE activities directly	continuous	information centres, marine libraries and librarians, IAMSLIC, ASFA
69	The Committee, noting the slow and limited establishment of NODCs by Member States, recommended that a statement inviting Member States to actively establish NODCs should be included in the Assembly draft decision on IODE	IOC-32 (prep for April 2023)	IODE Secretariat, IODE Co-Chairs
70	The Committee welcomed the steady growth in the number of IODE ADUs and invited organizations that manage oceanographic data currently not involved in IODE, to consider joining IODE as ADUs	continuous	Organizations that manage ocean data
82	The Committee instructed all IODE projects and invited Member States to contribute research and informational documents to AquaDocs	continuous	IODE projects
83	The Committee invited institutions and organizations, with insufficient capacity to host their own repository, to use AquaDocs.	continuous	Institutions and organizations
84	The Committee recommended that AquaDocs serve as the repository for reports and documents generated by the Decade Actions	As soon as possible	DCU
109	The Committee invited IQuOD to explore cooperation with other IODE projects such as ODIS/OIH, OTGA and others	As soon as possible	IQuOD, other IODE projects
117	The Committee congratulated the network of OBIS nodes and the Secretariat for the important achievements and reiterated its past requests to the IOC Executive Secretary to create a regular programme position for the OBIS data manager	January 2024 and continued	IODE Co-Chairs
124	The Committee urged the IODE community to further document their methodologies and best practices and share them in the Ocean Best Practices System	continuous	IODE community
128	The Committee called on Member States to participate in the Ocean InfoHub Project (OIH) to increase the visibility of their data holdings to the world, and to enable improved and more efficient access to global Ocean data	continuous	Member States
138	The Committee expressed its appreciation for the progress made by PacMAN, decided to continue this project and requested Member States to support the Secretariat and partners involved in PacMAN to further build upon and replicate PacMAN in other states, especially developing states and SIDS that are more vulnerable to the socio-economic impacts of marine invasive species. This will directly support Member States in implementing target 6 of the recently adopted CBD COP15 Kunming-Montreal 2030 targets, which aims to reduce the introduction of new invasive alien species by 50%, and puts emphasis on priority sites, such as islands	continuous	Member States
151	The Committee encouraged that IODE activities should be included in the work plans of the IOC Regional Subsidiary Bodies (RSBs) through active participation of IODE national coordinators	April 2023 and IODE-XXVIII	RSBs (IODE Secretariat to contact RSB Secretariats)

	(data management and information management), NODCs, ADUs and AIUs in meetings of the RSBs, and requested the IODE Secretariat to contact the regional IOC offices to ensure inclusion of data/information in the agenda of RSB meetings		
152	The Committee welcomed the offer by NMDIS (China), as ODINWESTPAC Secretariat, to actively participate in OIH/ODIS in preparation for new future arrangements of ODINs	As soon as possible	NMDIS and OIH/ODIS
159	The Committee instructed the IODE Management Group to (i) further clarify and finetune the naming definitions; (ii) propose the designation of all other IODE activities; and (iii) propose procedures to guide applications for new components, activities and projects, and submit these to the 28th Session of the IODE Committee in 2025	(i) 2023 (ii) 2023 (iii) 2024 and by IODE-XXVIII	IODE MG
164	The Committee approved the "Rules of Procedure for IODE Programme Components, Programme Activities or Projects" and instructed all projects to adopt these in their management structure by the next meeting of the IODE Management Group (December 2023/January 2024)	IODE MG (Dec 2023/Jan 2024)	IODE projects
165	The Committee instructed the Secretariat to publish the "Rules of Procedure for IODE Programme Components, Programme Activities or Projects" in the IOC Manuals and Guides series	End 2023	IODE Secretariat
170	The Committee instructed the SG-QMF to revise IOC Manuals and Guides No. 67 (IODE Quality Management Framework for National Oceanographic Data Centres and Associate Data Units (Revised edition)) to include the changes to the accreditation process	As soon as possible (2023)	SG-QMF
171	The Committee invited Member States to nominate suitably qualified experts with experience in implementing quality management systems for management of oceanographic data to the SG-QMF for the next intersessional period and instructed the Secretariat to send out the call for experts as soon as possible	As soon as possible	Member States/ IODE Secretariat
187	The Committee encouraged Member States, NODCs and ADUs to support the development of GO2DAT financially and in-kind	continuous	Member States, NODCs, ADUs
192	The Committee invited NODCs and ADUs, as well as relevant existing regional networks, to participate in the upcoming data collection calls	Continuous	NODCs, ADUs, regional networks
197	The Committee instructed its Co-Chairs to engage with the OCG Data Strategy Implementation Plan to ensure that it is fit for purpose from the ocean data management community standpoint	As soon as possible	IODE Co-Chairs
198	The Committee urged IODE experts to participate in (online) OCG meetings	As soon as possible	IODE experts
199	The Committee noted with appreciation the ambitious plan for a BioEco Data Portal that is an integrated resource for national, regional and global ocean observing system monitoring and planning, and instructed IODE OBIS to identify	As soon as possible	IODE/OBIS Secretariat

	the resource needs to fulfil this in a 2023-2025 planning proposal		
201	The Committee took note of the activities undertaken with the TSR and invited TSR to consider more extensive collaboration through relevant IODE activities	As soon as possible	IOC/TSR
208	The Committee noted the concerns expressed by the WESTPAC Secretariat and recommended that discussions should be held between the WESTPAC Member States, NODCs, ADUs and AIUs in that region, to identify needs and possible supporting measures	As soon as possible	WESTPAC Member States, NODCs, ADUs and AIUs in that region
211	The Committee urged IOC Member states to work on closer collaboration on interoperability between IOC/IODE OIH/ODIS and WMO WIS 2.0	As soon as possible	IOC Member States
212	The Committee instructed the Secretariat to invite WMO to join IODE activities under the Ocean Decade	As soon as possible	IODE Secretariat
216	The Committee invited IODE NODCs, ADUs and AIUs to report (as part of the reporting in preparation for IODE Committee meetings) on projects, programmes and other initiatives in which they are involved and relevant to IODE	IODE-XXVIII	NODCs, ADUs and AIUs
220	The Committee strongly recommended NODCs and ADUs in Europe to consider involving IOC/IODE as a partner in future EU project proposals	Continuous	NODCs, ADUs in Europe
225	The Committee proposed that the ASFA Secretariat impact study explores further cooperation between OpenASFA and AquaDocs assessing the impact on user communities and identifying any actions to support SDGs, the Ocean Decade and joint market opportunities	As needed	ASFA
227	The Committee recommended IODE and IAMSLIC to continue their relationship and create a new MOU of activities of mutual interest, including the provision of ongoing support by IOC/IODE and IAMSLIC to ensure the continuity of the AquaDocs Repository	As soon as possible	IODE, IAMSLIC
237	The Committee instructed the IODE Co-Chairs to prepare a brief statement for the 32nd Session of the IOC Assembly (June 2023) on the outcome of IODC2	April 2023	IODE Co-Chairs
238	The Committee instructed the IODE Management Group to prepare a proposal on the way forward to take the recommendations from IODC1 and IODC2 into consideration in the work plan of IODE during the next inter-sessional period (April 2023 – March 2025) as well as in the preparations for IODE-XXVIII	2023	IODE MG
267	The Committee encouraged NODCs/ADUs/AIUs to explore ways and opportunities to streamline their CD activities utilizing the Ocean CD-Hub	Continuous	NODCs, ADUs, AIUs
271	The Committee instructed the working group (to draft the new structure of the IODE web site), to restart the discussions on the restructuring of the website and the IODE Secretariat to proceed with the redevelopment by end of 2023	End of 2023	working group to draft the new structure of the IODE web site
295	The Committee urged IODE NODCs, ADUs and AIUs to also submit projects, preferably as IODE	Continuous	NODCs, ADUs, AIUs

	actions or including IODE as a "partner" in projects		
296	The Committee invited the IODE World Ocean Database (WOD) project to submit a Decade Action proposal via the IODE Secretariat	As soon as possible	WOD project
297	The Committee requested the DCU to keep the IODE Secretariat updated on any funding opportunities for the submitted Decade Actions and instructed the IODE Secretariat to update the IODE Management Group and IODE Committee on progress in this regard	continuous	DCU, IODE Secretariat
300	The Committee instructed the "IODE Intersessional Working Group (IWG) to identify the IODE contribution to the UN Decade of Ocean Science for Sustainable Development (2021-2030)" to focus its work on elements 2 and 3 of its terms of reference	IODE-XXVIII	IWG to identify the IODE contribution to the UN Decade of Ocean Science for Sustainable Development (2021-2030)"
301	The Committee welcomed the numerous submissions of Decade Actions by IODE and involvement in several other Decade Actions but called on the DCU for pro-active action to attract funding to enable the implementation of the submitted actions	continuous	DCU
302	The Committee called for the Decade's more active participation in IODE programme elements such as ODIS, OBIS, OTGA and others as these can all contribute substantially to the data and information requirements of the Decade	Continuous	DCU
307	The Committee instructed the IODE Co-Chairs to contact the IOC Executive Secretary and DCU management to inform them about the potential benefits of OceanExpert to the Ocean Decade and extend the offer again	As soon as possible	IODE Co-Chairs
317	The IODE Committee, taking into account the 2022 events and their global impact, decided (i) not to proceed with the establishment of the IODE Partnership Centre for ODIS during the next inter-sessional period and (ii) to consider this matter again at the 28th Session of the IODE Committee in 2025	IODE-XXVIII	IODE Committee
338	The Committee called on Member States to participate in the Ocean Data and Information System (ODIS), the Ocean InfoHub Project (OIH) and OceanData-2030 to increase the visibility of their data and information holdings to the world, and to enable improved and more efficient access to global Ocean data and information	Continuous	Member Sates
344	The Committee called on UNESCO Member States to approve one of the Base Case scenarios noting that the ZNG scenario would bring IODE below the minimum level of viability	2023	UNESCO Member States
352	The Committee urged the IOC Executive Secretary to provide additional staff to IODE.	2024	IODE Co-Chairs
354	The Committee called on Member States, philanthropic organizations or private companies to consider seconding, either at the IOC Project Office for IODE, in Oostende, Belgium or in-kind	Continuous	Member States, philanthropic organizations or private companies

	(working from their usual place of work) in order to strengthen the IODE Secretariat		
358	The Committee thanked the Government of Flanders (Kingdom of Belgium) and Flanders Marine Institute (VLIZ) for their support as an essential contribution to the resources needed by the IODE Programme, and called on the Government of Flanders (Kingdom of Belgium) and VLIZ to continue their support	2024	Government of Flanders (Kingdom of Belgium)
360	The Committee strongly urged IOC Member States to follow the Government of Flanders (Kingdom of Belgium) example and establish structural funding agreements to support IODE.	Continuous	IOC Member States
361	The Committee called on its members and parent institutions to involve IODE in any project proposal that includes data or information management elements	Continuous	IODE Committee members and parent institutions
366	The Committee requested that relevant events should be included in the OceanExpert calendar.	Continuous	IODE Committee members and IODE Secretariat
367	The Committee invited IOC regional offices to inform the IODE Secretariat on relevant events in their region	Continuous	IOC regional offices
368	The Committee recommended to the Ocean Decade Strategic Communication Group, to promote the importance of data and information inviting IODE and to join with the Ocean Decade events, among others, in which the Ocean Science community participates	Continuous	Ocean Decade Strategic Communication Group,
372	The Committee adopted the work plan and budget for the next inter-sessional period and invited Member States to provide additional support to IODE.	Continuous	Member States
376	The Committee instructed the Secretariat to send out a Circular Letter to invite additional members of the Inter-sessional working group on the review of IODE structure and working methods	As soon as possible	IODE Secretariat
397	The Committee requested its Co-Chairs and the IODE Secretariat to make editorial corrections as necessary, taking into account the discussions held during the session	As soon as possible	IODE Secretariat
398	The Committee requested the IODE Co-Chairs to present the Executive Summary to the Thirty Second Session of the IOC Assembly that would take place in June 2023	IOC-32 (June 2023)	IODE Co-Chairs

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