Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IODE Steering Group for OBIS (SG-OBIS)

Eleventh Session

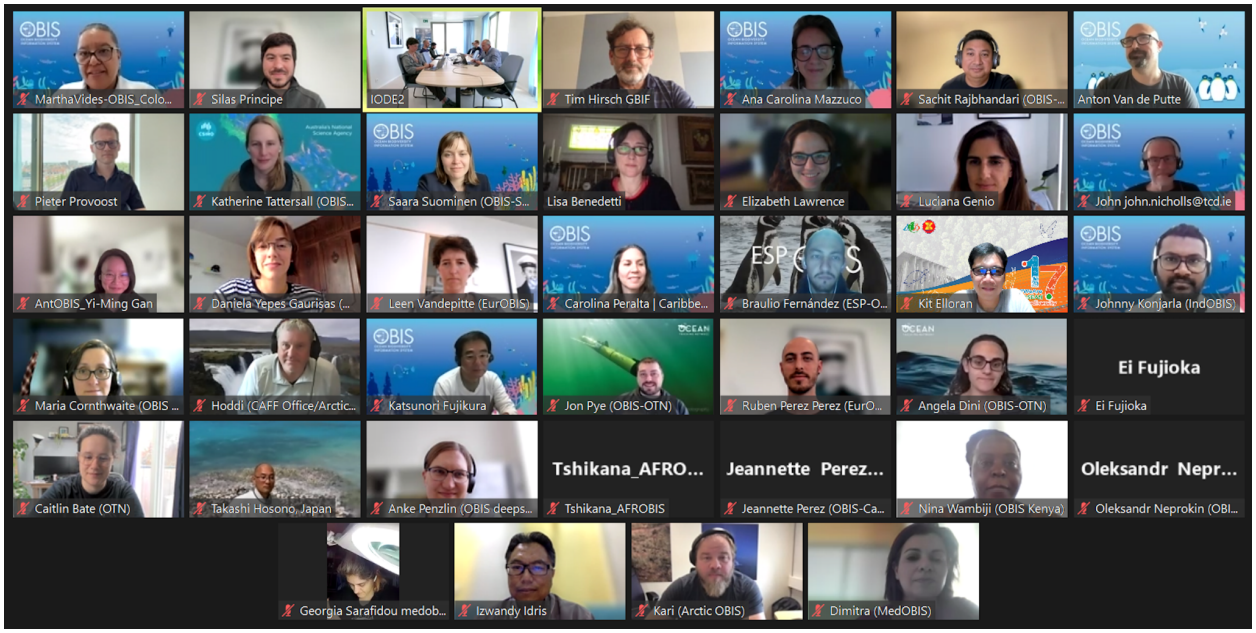
Online
23-26 May 2023

UNESCO

Table of Contents

Executive Summary **4**
1. Opening of the session and adoption of the agenda **5**
2. OBIS progress reports **7**
2.1. OBIS Executive Committee 7
2.2. OBIS Secretariat 11
2.2.1. Staffing and funding situation 11
2.2.2. Technical developments 13
2.2.3. Projects contributing to OBIS 14
2.3. OBIS nodes 20
2.3.1. OBIS node health check 20
2.3.2. OBIS node presentations 21
2.4. OBIS Task Teams 28
2.4.1. OBIS Strategic Advisory Task Team 28
2.4.2. OBIS Taxonomy Task Team 29
2.4.3. OBIS Capacity Development Task Team 30
2.4.4. OBIS Communication and Outreach Task Team 31
2.5. OBIS ad-hoc Project Teams 32
2.5.1. OBIS Data Quality Control Project Team 32
2.5.2. OBIS Vocabulary Infrastructure Project Team 35
2.5.3. OBIS UN Ocean Decade Project Team 36
2.5.4. OBIS Historical Data Project Team 36
2.5.5. OBIS Grand Unified Data Model Project Team 37
2.6. Collaborations and partnerships 38
2.6.1. GOOS BioEco and MBON 38
2.6.2. GBIF 39
2.6.3. LifeWatch ERIC 40
3. New Activities **41**
3.1. eDNA and OBIS 41
3.2. New OBIS management structure 42
3.3. OBIS2030 42
4. OBIS work plan **45**
5. Election of new OBIS Co-Chair **50**
6. Adoption of report **51**
7. Date and place of next session **51**
8. Any other business **52**
9. Closing **52**
10. Annexes **53**

IOC/IODE-SG-OBIS-XI
Online, 23-26 May 2023
English only



For bibliographic purposes, this document should be cited as follows: IODE Steering Group for OBIS (SG-OBIS), Eleventh Session, 23-26 May 2023, Reports of Meetings of Experts and Equivalent Bodies, UNESCO 2023 (English), UNESCO, 52 pp. 4 annexes.

Executive Summary

The 11th session of the IODE Steering Group for the Ocean Biodiversity Information System (SG-OBIS-11) was held online from 23-26 May 2023. The meeting was attended by 45 representatives from 24 OBIS nodes, the OBIS Secretariat and GBIF secretariat, spanning 22 countries. The following key outcomes and decisions were made during the session:

Since the last meeting in May 2022, OBIS nodes published 8.8 million new records, 360 new datasets, 17 million new measurements, and reported 23,000 previously unreported species names. These contributions increased OBIS' total records to 108 million, measurements to 191 million, datasets to 4,779, and marine species to 180,000.

The IODE Committee transitioned OBIS from a project to an integral component of the IODE programme. New rules of procedures were adopted by IODE, which OBIS will incorporate into its management structure. As a programme component, OBIS will receive core UNESCO/IOC Regular Programme funding and staff support, ensuring its permanent operation and attractiveness for potential partners.

Considering the possibility that IOC will see a substantial increase in funding from UNESCO, the OBIS steering group requested IOC Member States to advocate for more stable funding and a regular programme position for the OBIS data manager during the upcoming IOC Assembly.

Five new Intersessional Working Groups (IWGs) were established to address key areas:
(i) IWG-OBIS-Data Policy will develop data and metadata sharing guidelines that can be added as annexes to the new IOC data policy if adopted by the IOC Assembly.
(ii) IWG-OBIS-Comms will develop a communication and Outreach plan to enhance OBIS' visibility and funding opportunities.
(iii) IWG-OBIS-DNA will focus on DNA-derived data sharing.
(iv) IWG-OBIS-Structure will develop a new management structure aligned with IODE rules and procedures.
(v) IWG-OBIS-Products will create a collaborative and interdisciplinary platform for the development of indicators and information products.

The UN Ocean Decade and Historical Data project teams were successfully closed, the Strategic Advisory task team was dissolved, and the role of various OBIS task teams will be considered by the IWG-OBIS-Structure.

The OBIS steering group adopted a new 5-year Capacity Development strategy (2023-2027) with a focus on regional implementation.

The endorsement of the OBIS 2030 proposal as a project of the UN Ocean Decade of Ocean Science for Sustainable Development was welcomed. The collaboration with GOOS, MBON, and GBIF was reinforced, and a new collaboration with LifeWatch ERIC will be established.

Anton Van De Putte was thanked for serving his term and Katherine Tattersall was appointed as the new OBIS Co-Chair.

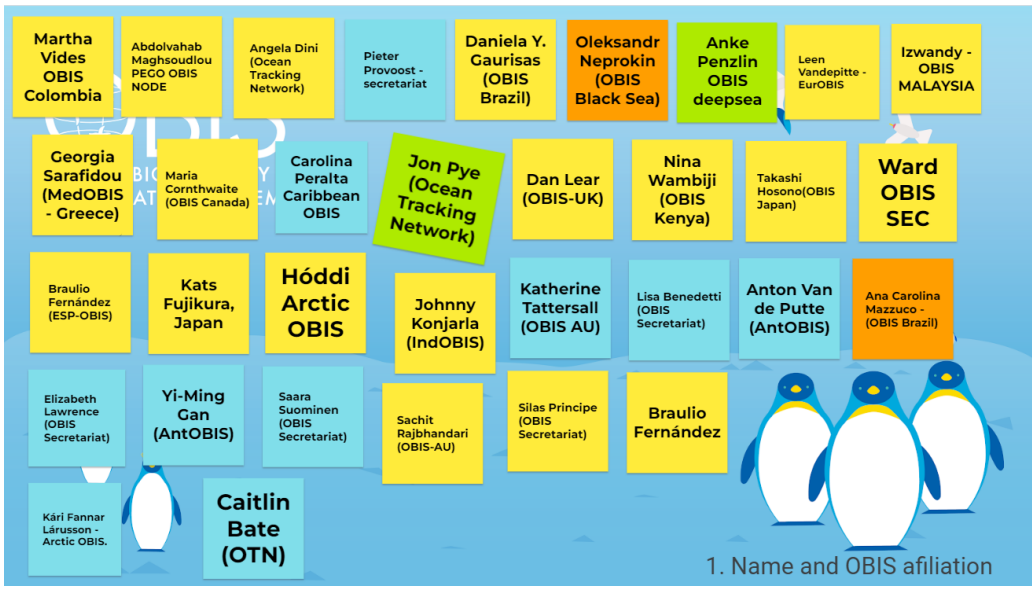
The 11th session of the IODE Steering Group for OBIS showcased the significant growth of OBIS data, its transition of a project to a programme component of IODE, the establishment of new working groups, adoption of a new CD strategy, and important collaborations. The OBIS community aims to enhance data sharing, visibility, funding opportunities, and contribute to the UN Ocean Decade goals.

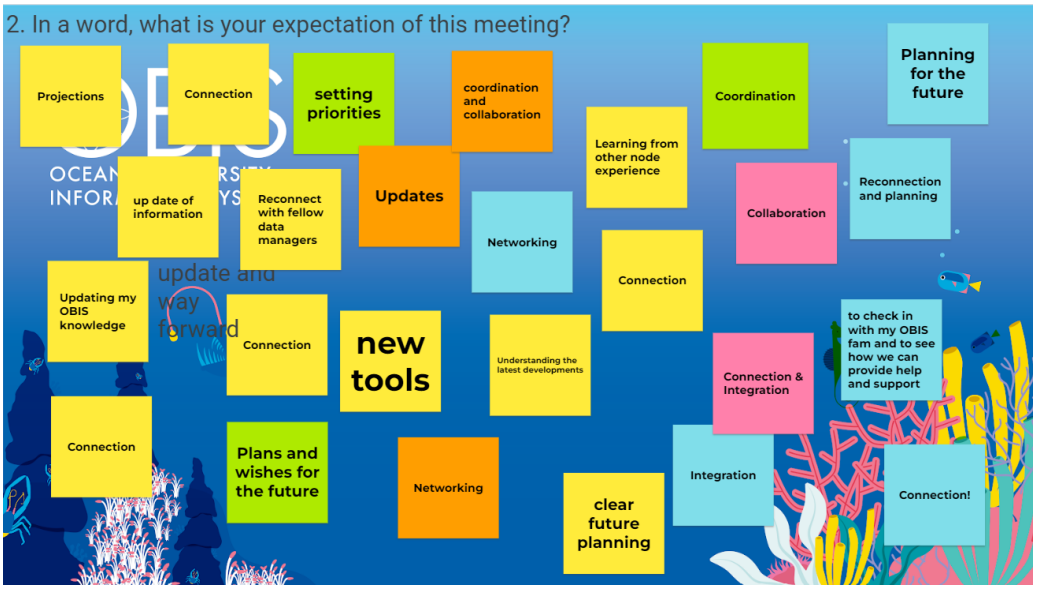
1. Opening of the session and adoption of the agenda

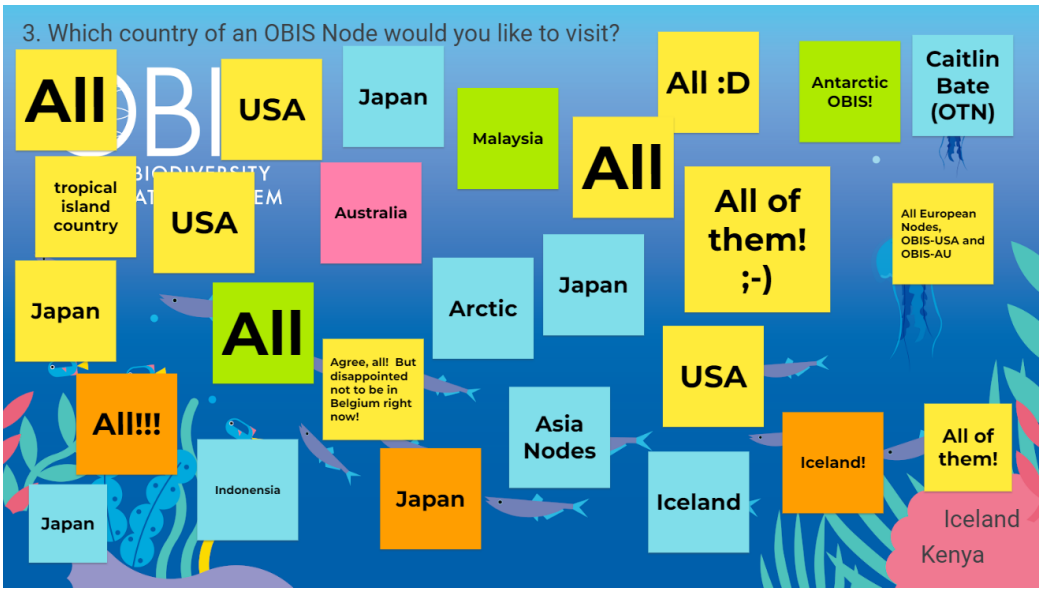
The eleventh session of SG-OBIS was opened by co-chairs Mrs Martha Vides and Mr Anton Van de Putte, who warmly welcomed all the participants. To ensure that the new members feel included, a round table introduction was conducted using Jamboard, where all members had the opportunity to introduce themselves and express their expectations for the meeting. We extended a warm welcome to our new members, and we hoped they would find this session productive and informative.

Everyone was asked to put the OBIS node name next to their name in Zoom. e.g. Martha Vides (OBIS Colombia).

A round table of introduction was made using Jamboard and three questions were answered:







After the round table introduction, Mrs Vides proceeded to introduce the agenda for the session.

Apologies were received from: Abby Benson (OBIS-USA), Hanieh SAEEDI (OBIS deep-sea) and Dave Watts (OBIS-AU).

The **SG-OBIS adopted** the agenda, but changed the time table switching Thursday and Wednesday.

Mr Anton Van de Putte informed the SG-OBIS that he has now served his 2-year term and did not want to ask the SG for a renewal of another term due to other work priorities. This means

that we needed to appoint a new OBIS co-chair. Martha Vides is now also entering her final year as co-chair.

The SG-OBIS members were asked to nominate (including self-nominate) members to become OBIS co-chair. The election of a new OBIS Co-Chair took place under agenda item 5.

The **SG-OBIS expressed** gratitude to Anton Van de Putte for co-chairing OBIS over the last two years.

2. OBIS progress reports

2.1. OBIS Executive Committee

Ms Martha Vides introduced this agenda item. To provide updates on the progress made in the implementation of the OBIS work plan and discuss any challenges encountered, the OBIS executive committee convened meetings on a quarterly basis (specifically, on 14 June 2022, 14 September 2022, 14 December 2022, and 14 March 2023).

Ms Martha Vides represented OBIS at the Pre-Committee meeting of the IODE Management Group, 21-22 Feb 2023 (online) and Dr Lennert Tyberghein (EurOBIS) represented the SG-OBIS at the 27th session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE-XXVII) at UNESCO Headquarters, Paris, France between 22 and 23 March 2023 (meeting report[1]), where he reported on the progress of OBIS.

Ms Martha Vides informed the SG-OBIS that the IODE Committee made the following statements related to OBIS:

- The Committee commended the network of OBIS nodes and the Secretariat for their significant achievements and affirmed its commitment to continue supporting OBIS.
- The Committee also reiterated its previous requests to the IOC Executive Secretary to establish a regular programme position for the OBIS data manager. The IODE Committee is aware of the critical need for a data manager and at the recent 27th session reiterated its past requests to the IOC Executive Secretary to create a regular programme position for the OBIS data manager. However, the Committee also expressed its disappointment that, despite several requests at previous Sessions of the IODE Committee, no additional regular positions for IODE/OBIS had been created and that other priorities had been decided upon.
- The Committee agreed with the proposal to remove OBIS Senegal as inactive OBIS node, and invited inactive nodes to re-join when they have the necessary capacity.

[1] https://oceanexpert.org/document/32021

The IODE Committee is also considering developing a process to assess the NODC health status within the IODE network, and reference was made to the OBIS node health check[2], which outlines a procedure for regular health checks and remedial measures. An IODE intersessional working group has been established to propose such a strategy for NODCs and OBIS is represented by Sheldon Carter (OBIS ADU ISA, Jamaica) and Lennert Tyberghein (OBIS SG).

An important change for OBIS was the approval by the IODE Committee to designate OBIS (and ODIS and OTGA) as a Programme Component, and no longer a project, which should make OBIS more attractive to potential partners for cooperation. The IODE Management Group has been instructed to clarify and finetune the naming definitions, propose the designation of all other IODE activities, and propose procedures for guiding applications for new components, activities, and projects, submitting them to the 28th Session of the IODE Committee in 2025. It is important to note that the IODE Committee decided that programme components should receive core UNESCO/IOC RP funding and staff support that enables the activity to operate on a permanent basis, while activities and projects should mostly or be fully funded from extra-budgetary sources (Each Programme Component or Programme Activity can be further strengthened through “Projects”).

The IODE Committee has also approved new rules of procedure for IODE projects[3] and instructed all projects (including OBIS) to adopt them in their management structure by the next meeting of the IODE Management Group in December 2023/January 2024. These rules of procedure will assist new and existing projects in drafting their projects and steering group terms of reference, electing (Co-)Chairs and their terms of reference, and election procedures.

The IODE Committee also approved the draft IOC Data Policy and Terms of Use (2023) and recommended that data and associated metadata should be submitted, to the best practicable degree, to IODE's World Ocean Database (WOD), OBIS, Global Sea Level Observing System (GLOSS), other IOC-related global data archives, and data centres linked to the World Data System (WDS) for long-term and secure archival.

The IODE Committee also decided that all IOC programmes and projects should develop detailed data and metadata sharing guidelines, which can be added as an annex to the new IOC data policy. This will be important as we currently receive requests from academic as well as private/commercial enterprises to use, develop products, and redistribute data from OBIS as a service.

Regarding the OBIS budget, Mrs Vides reported that in our OBIS workplan and budget, which we submitted to the IODE Management Group (see OBIS report[4]), we requested a budget of US$231,000 for 2023 and US$220,000 for 2024. These funds were intended to cover the costs of a full-time data manager and a training officer, who would support core operations such as system maintenance, help desk support to OBIS nodes, and supporting various task and project

[2] https://manual.obis.org/nodes.html#obis-node-health-status-check-and-transition-strategy
[3] https://oceanexpert.org/document/31838
[4] https://oceanexpert.org/document/31327

teams (see table 1). However, IODE is currently unable to provide this level of financial support. The IODE Committee could allocate US$18,000 for the year 2023 and US$21,000 for 2024. Of this, US$7,000 has been set aside to cover the annual costs of running OBIS on a commercial cloud provider. The remaining funds are allocated to be utilized to cover expenses related to SG-OBIS meetings and co-chair travel.

Table 1: The OBIS budget covering operational expenses and salary for OBIS data manager and OBIS training officer, submitted (requested) vs approved (allocated) by the IODE Committee in March 2023.

Activity	**Requested, in US$ for 2023**	**Requested, in US$ for 2024**	**Allocated, in US$ for 2023**	**Allocated, in US$ for 2024**
Annual SG-OBIS sessions (travel)	25,000	25,000	11,000	14,000
EC-OBIS meetings (online)	0	0	0	0
OBIS training material and OBIS manual maintenance and organize regular webinars or online workshops (salary for OBIS training officer)	60,000	60,000	0	0
OBIS Communication & Outreach	0	0	0	0
OBIS QC developments (salary OBIS data manager)	11,000	11,000	0	0
OBIS vocab developments	0	0	0	0
Implement chronometric data into the OBIS platform (salary OBIS data manager)	11,000	0	0	0
OBIS GUMPT activities	0	0	0	0
Development and maintenance of the OBIS system (salary OBIS data manager + cloud service costs)	60,000	60,000	7,000	7,000
Support for the establishment of new OBIS nodes (salary OBIS data manager)	11,000	11,000	0	0
Helpdesk support to existing OBIS nodes and users (salary OBIS data manager)	53,000	53,000	0	0/10,000*
Total	**231,000**	**220,000**	**18,000**	**21,000/31,000 ***

*The UNESCO General Conference in November 2023 will decide on the IOC budget (base case vs zero growth). In case of base case (increase), OBIS will receive 10,000 US$ extra.

Ms Yi-Ming Gan (AntOBIS) asked what OBIS nodes can do to make IOC create a regular programme position for the OBIS data manager.

Mr Peter Pissierssens, head of the IOC Project Office for IODE, responded that it is important that, during the IOC Assembly, Member States verbally express the need for a regular programme position for an OBIS data manager, in plenary as well as during the sessional working group on IOC's programme and budget. The final decision is up to the IOC Executive

Secretary and dependent on availability of funds, but if no Member States make this a priority then the chance that a new position for OBIS will be created is small.

Mr Pissierssens also added that the UNESCO Executive Board just recommended an increase in the Intergovernmental Oceanographic Commission (IOC)'s share of the UNESCO regular budget of [1 %] to ensure it has adequate human and financial resources in order to fully implement its responsibilities. If this is adopted by the UNESCO General Conference in November 2023 then this will imply a considerable budget increase for IOC and hopefully for its programmes and activities such as OBIS. Decisions on priorities for new staff at IOC will need to be taken so this is a good opportunity to make a call.

It was also noted and welcomed that in the last year UNESCO has been promoting OBIS in several social media stories as an important asset and the collaboration with the UNESCO Science and Culture Sector (e.g. with World Heritage) is seen as an example of intersectoral collaboration within UNESCO. Also OBIS provides important visibility to UNESCO and therefore it should provide the necessary resources to operate and for the secretariat to be less dependent on donor funding. In addition, many countries are investing a lot of resources in running an OBIS node and UNESCO/IOC should provide the necessary resources to the OBIS secretariat to allow it to support and coordinate this global network of OBIS nodes.

The **SG-OBIS requested** all OBIS nodes to contact their IOC national delegations (see list at https://oceanexpert.org/document/17716) as soon as possible and before the IOC Assembly starting 20 June 2023, to ask them to make a case during the upcoming IOC Assembly to request more stable funding for OBIS operations and staffing and create a regular programme position for the OBIS data manager.

To respond to the IODE Committee, the **SG-OBIS decided** to establish an intersessional working group to develop detailed data and metadata sharing guidelines that can be added to the new IOC data policy if adopted by the IOC Assembly. This should provide any potential future users a more solid framework to use OBIS data and develop services making use of OBIS data. The IWG-OBIS data policy should provide their draft proposal to the SG-OBIS which if approved will be sent to the IODE-MG within 6-months after the adoption of the new IOC data policy by the IOC Assembly (currently foreseen end of June 2023).

The following OBIS nodes expressed interest in joining the IWG-OBIS Data Policy:
OBIS-UK, OBIS OPI, OBIS Canada.

2.2. OBIS Secretariat

2.2.1. Staffing and funding situation

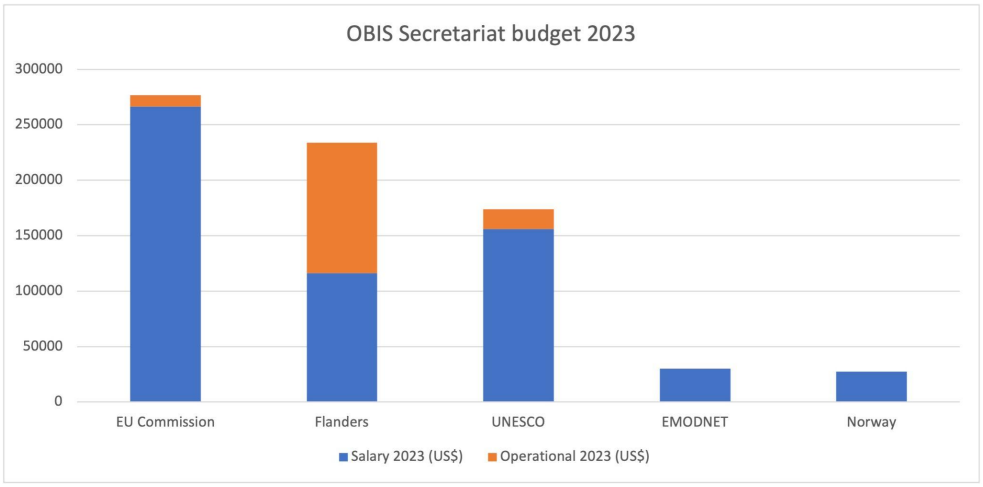
Mr Ward Appeltans (OBIS project manager) introduced this agenda item. He reported that the OBIS secretariat has been able to attract a substantial amount of extra-budgetary funding mostly from the European Union Horizon Europe programmes as well as from Flanders Funds

(see Fig 2), of which 80% is allocated to salary. Currently the OBIS secretariat is composed of the following 7 staff members (RP = Regular programme funding from UNESCO, XB = Extrabudgetary Funding from donors):

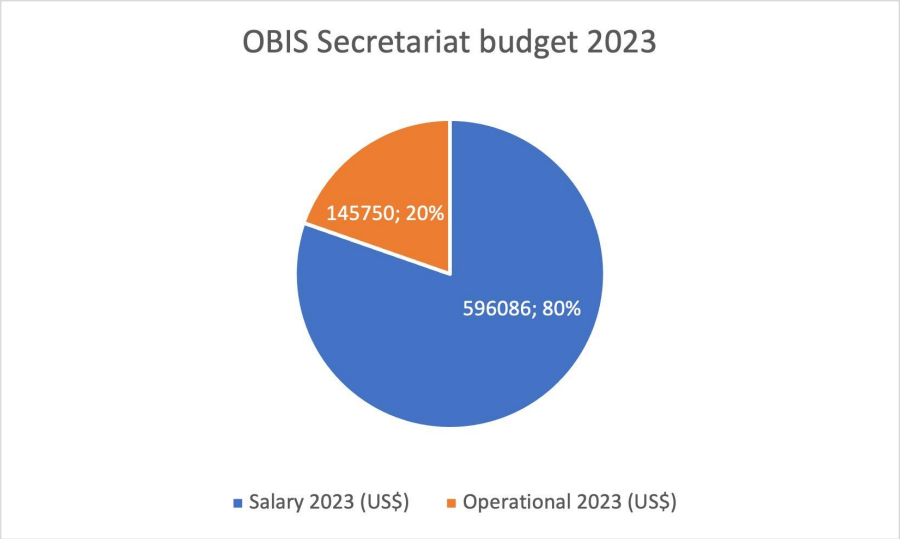
Name	Title	Funding source	Contract type	Until date
Mr W. Appeltans	OBIS project manager	RP/UNESCO	P3 Fixed Term	Permanent
Mr P. Provoost	OBIS data manager	XB/PacMAN/MBO/eDNA	P3 Project App	end of 2026
Mr S. Principe	OBIS researcher, SDM	XB/MPA Europe	P2 Project App	March 2025
Dr S. Suominen	OBIS genetic data officer	XB/MBO/eDNA expeditions	Consultant	end of 2025
Ms L. Benedetti	OBIS stakeholder officer	XB/MBO	Consultant	end of 2026
Dr E. Lawrence	OBIS training officer	XB/NORAD	Consultant	end of May 2023
TBD	eDNA data officer	XB/eDNA expeditions	Consultant	June-August 2023

Figure 1: OBIS secretariat budget of 2023 in US$ by donor and category (a) and by category only (b).

(a)



(b)



The initial funding that the OBIS Secretariat received for the development and maintenance of the GOOS BioEco portal has been exhausted and therefore the contract of Mrs Serita Van der Wal (GOOS BioEco data manager) could not be extended. She left the secretariat at the end of March 2023.

As part of the PacMAN project, the OBIS secretariat also contracts the University of the South Pacific to implement the local activities, which involves 4 people.

At this moment, no additional positions are foreseen on the new projects described under item 2.2.3.

2.2.2. Technical developments

Mr Pieter Provoost (OBIS data manager) introduced this agenda item and reported on the technical developments as well as on the results of the OBIS user survey.

The OBIS user survey was launched in July last year and consisted of 28 questions on accessing and using OBIS data. The full results of the survey and all textual responses with some annotations from the secretariat are available here: https://oceanexpert.org/document/32616. We received 99 responses, with most respondents identifying as academic users (77%), followed by research centers (28%) and government (11%). The secretariat performed a first analysis of the free text responses and found that most issues and suggestions can be categorized as:

- Lacking or unclear documentation
- Data quality and completeness issues

- Insufficient quality control
- Data access user experience
- Training requirements

While some suggestions cannot be implemented without the allocation of additional resources (e.g. image hosting), other requests from the OBIS community align with the objectives of the funded projects the secretariat is involved in. Some improvements could be implemented within these projects and address some of the issues raised by the respondents at the same time. For example:

- Improving the OBIS manual content and website user experience. This effort is already underway.
- Searchable keyword tags for datasets, from metadata or inferred. This is necessary for the DTO-BioFlow project for example, but would also give the users better filters to get to the right data. For example: tracking data, metabarcoding data, timeseries, EOVs.
- Integration of WoRMS traits. This needs to be implemented for MPA Europe and would also result in more useful data filters. For example: benthic/pelagic, paraphyletic groups.
- Quality control of taxonomic annotations of sequence based datasets. A bioinformatics pipeline and taxonomic annotation algorithms are being developed for PacMAN, eDNA Expeditions, AtlantECO, and MARCO-BOLO. This could be used for quality controlling sequence based datasets which currently suffer from quality issues.
- Quality control using WoRMS distributions and species distribution models. These developments are required for PacMAN, eDNA Expeditions, and MPA Europe.

In terms of technical developments we have focused on improving the workflow for annotating the taxon names which cannot be automatically matched with WoRMS. A web application has been developed at VLIZ for managing the annotated names (see taxonomy task team report), and we have developed a workflow (https://github.com/iobis/names-sync) for submitting names to this application in an automated way using a web service.

2.2.3. Projects contributing to OBIS

Mr Ward Appeltans reported that in the last few years, the OBIS secretariat has been successful in raising new funding that enabled us to continue supporting the OBIS network and develop new resources and capabilities. The OBIS secretariat members involved in these projects provided a status update and explained how these projects are important for OBIS.

2.2.3.1. Development of 50 OBIS training tutorials

Dr Elizabeth Lawrence (OBIS training officer) reported on the capacity development project funded by Norway (NORAD). She introduced us to the 64 tutorial topics that were agreed upon by the OBIS community, and which have been incorporated into the OBIS Manual as well as YouTube video tutorials. These topics were organized into distinct phases in the OBIS life cycle

in order to provide clear, step-by-step guidance starting from understanding the standards that OBIS adheres to, to formatting and publishing datasets. The video tutorials targeted specific procedures such as using the WoRMS taxon match tool, creating identifiers, formatting Event, Occurrence, and eMoF data tables, using the OBIS Maptool, and publishing on IPT. A course based on these developed resources was also created and hosted on the OceanTeacher Global Academy e-learning platform to provide a self-paced course that includes learner assessment.

Dr Lawrence also informed us on a new EU Horizon project proposal called BioEcoOcean (Call HORIZON-CL6-2023-CLIMATE-01-8). The aim of this project is to co-create a Blueprint for Integrated Ocean Science (BIOS) which will support and encourage operational workflows that adhere to FAIR Data Principles. OBIS has several roles in this project, including taking the lead on developing and implementing the project's Data Management Plan. OBIS will also lead a work package to develop and organize training courses that facilitate blueprint implementation and management of collected data and metadata according to our OBIS biodiversity standards. Activities within this project will help integrate data contribution to OBIS into global marine observation programme procedures, as well as facilitating adherence to data standards. This will improve visibility, expand the OBIS community, and increase data flows to OBIS.

EurOBIS, OTN-OBIS, OBIS AU, OBIS-Colombia, Caribbean OBIS and OBIS Brazil expressed interest to test the OBIS training course on OTGA.

SG-OBIS requested the OBIS secretariat to translate the OBIS manual into multiple languages and OBIS Colombia and Caribbean OBIS offered to help with the Spanish version and OBIS Brazil with Portuguese, OPI-OBIS with German and Dutch. OBIS Canada will investigate whether resources are available to assist with French translation of written materials such as the OTGA training course and OBIS manual.

2.2.3.2. Atlantic Ecosystems Assessment, Forecasting & Sustainability (AtlantECO)

Mr Pieter Provoost informed us on developments within the EU-funded project AtlantECO (https://www.atlanteco.eu/). The OBIS secretariat is responsible for setting up data flows for data generated by the project into OBIS, in particular for sequence based microbiome data from EBI's microbiome metagenomics platform MGnify (https://www.ebi.ac.uk/metagenomics/). Darwin Core exports from MGnify already exist at GBIF (https://github.com/gbif/mgnify-to-dwc), but these do not make use of the recently created DNADerivedData extension and do not include OTU or ASV sequences. We started work on a Python library for exporting Darwin Core Archives with sequences from MGnify (https://github.com/iobis/mgnify-extract), but identified some issues with the MGnify pipeline (i.e., the absence of denoising or OTU clustering) which prevents us from adding representative sequences to the species occurrences. We considered working with the GBIF exports for the time being, but there are some doubts about the quality of the taxonomic annotations so this will require further work. The bioinformatics pipeline developed at the secretariat (https://github.com/iobis/PacMAN-pipeline) may offer a solution here once it is a bit more tried and tested.

2.2.3.3. Pacific Islands Marine Bioinvasion Alert Network (PacMAN)

Mr Pieter Provoost informed us on developments within the PacMAN project (Pacific Islands Marine Bioinvasion Alert Network). During this year PacMAN has been further established in Fiji and is well known to the local stakeholders for marine invasive species. The PacMAN field protocols and DNA extraction workflows have been extensively tested and operationalized, while the project has moved forward in training, stakeholder work, and the data management workflows. All data management for the project including the tracking of samples, specimens, images, etc is now done on the PlutoF platform (https://plutof.ut.ee/). Other technical components of the project such as the bioinformatics pipeline and the decision support system will connect to the data management platform via web services.

In November 2022, a PacMAN hybrid training course was held, consisting of an initial online phase to familiarize participants with invasive species theory and PacMAN protocols, followed by a week of practical field and lab work, including bioinformatics. This was the first-ever practical training course on environmental DNA held in Fiji and hosted on an international platform. The feedback received was overwhelmingly positive, with participants requesting more time for bioinformatics and data analysis.

A news item about the training was posted on the USP and UNESCO websites. The training material, including on-site training protocols, has been published in a self-paced learning course on OTGA (OTGA_PacMAN_eDNA: Marine Invasive Species Early Detection: Utilising Molecular Tools_2023), which is available to anyone after registration on OceanExpert. The course includes a tutorial on utilizing the PacMAN bioinformatics pipeline and will remain open until mid-December 2023.

PacMAN has made good progress in developing a prototype decision support tool in collaboration with local stakeholders. The tool was co-designed through an on-site stakeholder meeting involving all key stakeholders in the PacMAN local advisory board. This tool will enable risk assessment of species and raise alarms if a high-risk species is detected. It can be easily extended to other communities and has the potential to become a data source for a network of monitoring programs in the Pacific Islands. The PacMAN decision support tool could also serve as a framework for building decision support tools in other geographic areas, utilizing OBIS data.

In addition, this year PacMAN is finalizing molecular work protocols and preparing to move towards operational sampling and sample processing. The project team is exploring possibilities of working on economic impact assessments and building closer relationships with the International Maritime Organization and their UNDP/GEF-funded Glofouling partnership project.

The PacMAN bioinformatics pipeline (https://github.com/iobis/PacMAN-pipeline) is continuously being improved and will be used for other projects such as eDNA Expeditions as well. We hope

to evolve this into a general purpose and easy to use tool that can benefit the entire OBIS network.

2.2.3.4. Integration of biodiversity monitoring data into the Digital Twin Ocean (DTO-BioFlow)

Mr Pieter Provoost informed us of a new EU Horizon project, led by VLIZ, that will start in September 2023, called Integration of biodiversity monitoring data into the Digital Twin Ocean (DTO-BioFlow). DTO-BioFlow will transform access to data on ocean biodiversity, enabling the sustainable integration of these data flows into the EU Digital Twin Ocean. The OBIS secretariat has a supporting role in the following tasks:

- Inventory and analysis of defining frameworks for biodiversity monitoring
- Inventory of unavailable data sources and priority list for integration
- Blueprint for a sustainable biodiversity data flow across data types
- Building the biodiversity component with other relevant biodiversity data sources
- Bringing in the Biodiversity Data Provider perspective: Pathways towards sustaining the flow of data into the EU DTO framework
- Bringing in the User perspective in support of Mission Ocean
- International cooperation & best Practices and support to the Ocean Decade
- 2030 Biodiversity Targets & Digital Twinning in support of Mission Ocean

2.2.3.5. eDNA expeditions in marine World Heritage sites

Dr Saara Suominen (OBIS scientific officer, genetic data) reported that OBIS also plays a crucial role in a new Flanders Government funded project "eDNA expeditions in marine World Heritage sites", which IOC implements together with UNESCO's World Heritage Centre. The eDNA expeditions initiative is a two-year project to collect eDNA samples from approximately 25 marine World Heritage sites, analyse the DNA sequences in a designated central laboratory, and make the resulting data openly accessible through OBIS. The project is a global collaboration that seeks to establish a standardized approach to collect, process, and publish eDNA data from citizen science sampling campaigns. The project will also look at potential impacts of climate change on shifts in species composition. This is especially important for the 50 flagship marine protected areas on the UNESCO World Heritage List that host over 20% of the world's blue carbon ecosystems and are a refuge for at least 35% of the world's vulnerable and endangered species (based on data from OBIS).

In this project, the OBIS secretariat is responsible for the scientific and capacity development activities including the development of the sample collection, processing and analysis protocols. So far, the following information is available:

- The sampling kits and training materials, including the instruction video, sample information sheet and a field sampling instruction booklet (in six languages): https://www.unesco.org/en/edna-training-materials.

- A sample registration web application: https://app.ednaexpeditions.org.

The sampling protocols will also be published openly in the OBOS BeBop protocol collection in a standard format: https://github.com/BeBOP-OBON/UNESCO_protocol_collection
The OBIS secretariat will be responsible for the scientific analysis. The data will be analysed using the open-access PacMAN bioinformatics pipeline (https://github.com/iobis/PacMAN-pipeline) and finally, the results will be published on a dedicated data portal and a UNESCO publication. This will demonstrate how data products developed from OBIS information can provide valuable insights for environmental and marine spatial managers. The experience from this global eDNA project helps position OBIS as an end-to-end provider of eDNA data services, and will help develop the OBIS network and community at large in using established data workflows and protocols for future eDNA projects.

2.2.3.6. A plan for a European eDNA digital ecosystem for the next generation of aquatic biodiversity monitoring (eDNAqua-Plan)

Dr Suominen also informed us that in a few months, the OBIS secretariat will also be involved in a new EU Horizon project called: "eDNAqua-Plan: A plan for a European eDNA digital ecosystem for the next generation of aquatic biodiversity monitoring". The eDNAqua-Plan project aims to 1) collect information on existing projects, initiatives, and infrastructures for aquatic eDNA monitoring in the EU and associated countries, 2) provide an overview of all national and international activities related to standardization and interoperability of methods and data workflows, and 3) assess the feasibility and relevance of creating a digital ecosystem of eDNA repositories and an integrated and dynamic reference library of marine and freshwater species that is open-access and based on FAIR principles. By leveraging the strengths of large EU research projects and infrastructure, such as EMODnet, BIOSCAN-Europe, the Ocean and Water knowledge system, LifeWatch, and international systems such as ELIXIR/EBI and OBIS, the eDNAqua-Plan consortium seeks to maximize synergies and promote interoperability internationally. The implementation of eDNAqua-Plan will be demonstrated through use cases from national and transnational water monitoring programs. Based on this, eDNAqua-Plan will deliver a roadmap for harmonized aquatic monitoring using eDNA tools in Europe and beyond. For OBIS, the project will help in defining and streamlining eDNA data workflows in communication with a broad European stakeholder community as well as summarising and aligning international standardisation efforts. This work will clarify and simplify the eDNA data management options currently available, and make eDNA monitoring for management an increasingly feasible tool.

2.2.3.7. MARine COastal BiOdiversity Long-term Observations (MARCO-BOLO)

Ms Lisa Benedetti (OBIS stakeholder engagement officer) introduced the new EU Horizon MARCO-BOLO (MARine Coastal BiOdiversity Long-term Observations, https://marcobolo-project.eu/) project which will structure, strengthen, and connect European

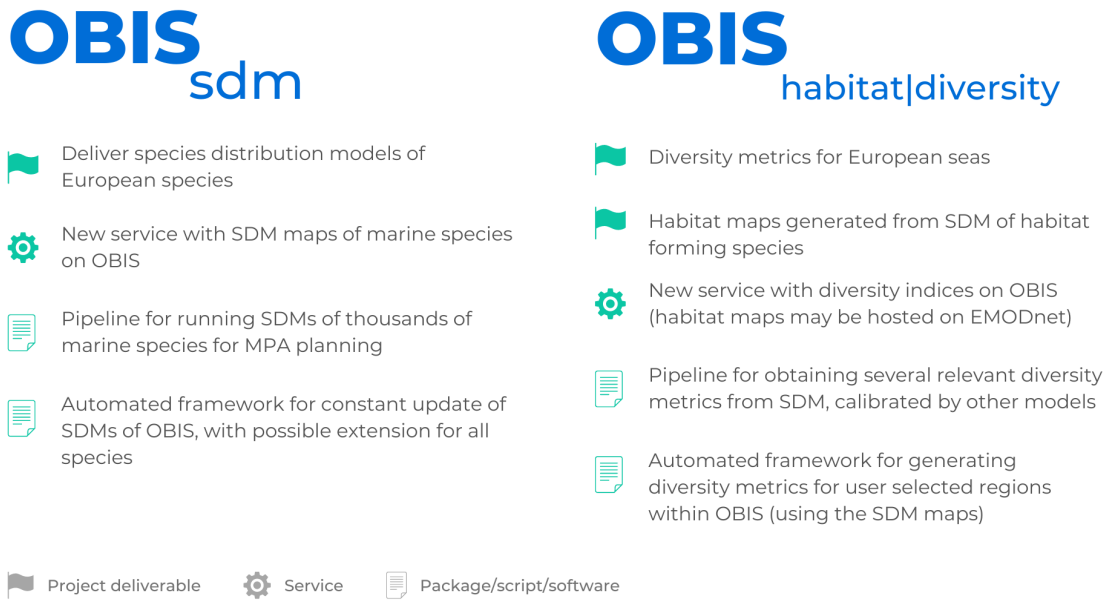
coastal and marine biodiversity observation capabilities, linking them to global efforts to understand and restore ocean health. This effort will improve how marine biodiversity is monitored and protected in marine and coastal environments across Europe and beyond.

The OBIS Secretariat is contributing to several activities: (i) delivering Essential Biodiversity Variables (EBVs) for marine and coastal systems, (ii) protocols, standard operating procedures, and integration of eDNA-based approaches, and (iii) stakeholder engagement and community integration. A key role for the Secretariat is to establish and coordinate a Community of Practice for the project (the “MARCO-BOLO CoP”). Through the CoP, generators and users of biodiversity data will be brought together to co-design and co-develop biodiversity tools and services that are fit for purpose and suit the needs of users at local, national, regional and international levels. For example, tools and services which address the full pipeline of marine biodiversity data collection and use: from testing new monitoring tools using eDNA, robotics, optical and acoustic techniques, to data integration methods for environmental modeling, and guidance on how data can be stored, shared, and applied in policy contexts.

2.2.3.8. Marine Protected Areas Europe (MPA Europe)

Mr Silas Principe (OBIS biodiversity modeler) introduced us to a new EU Horizon project "Marine Protected Areas Europe (MPA Europe, https://mpa-europe.eu) which aims to identify the locations within the European seas where MPAs would protect the highest number of species, habitats and ecosystems. This information is crucial to establish a functional MPA network and will help managers to propose further areas for conservation in the future. Innovative and bold, MPA Europe will also go one step further by considering the potential blue carbon benefits of the prioritization.

The OBIS secretariat will contribute with three pieces of information which will be supplied to the area prioritization process: (i) species distribution models (SDMs) of at least half of the European marine species; (ii) diversity metrics for European seas; and (iii) habitat maps considering habitat forming species. In all cases, models will be created using OBIS data and will include predictions for future scenarios according to CMIP6.



Beyond the deliverables for the MPA Europe project (see Fig), this project will bring several benefits for the wider OBIS community. Pipelines for SDM generation of massive numbers of species using OBIS data will be established and made available as open source. Also, new services will become available on the OBIS platform for users to obtain the SDM and diversity maps created. It's also expected that an automated pipeline will be set up to produce and make available SDMs for all species within OBIS in the future. This will boost the possibilities of uses of OBIS, making ready-to-use data available for researchers and managers.

2.3. OBIS nodes

2.3.1. OBIS node health check

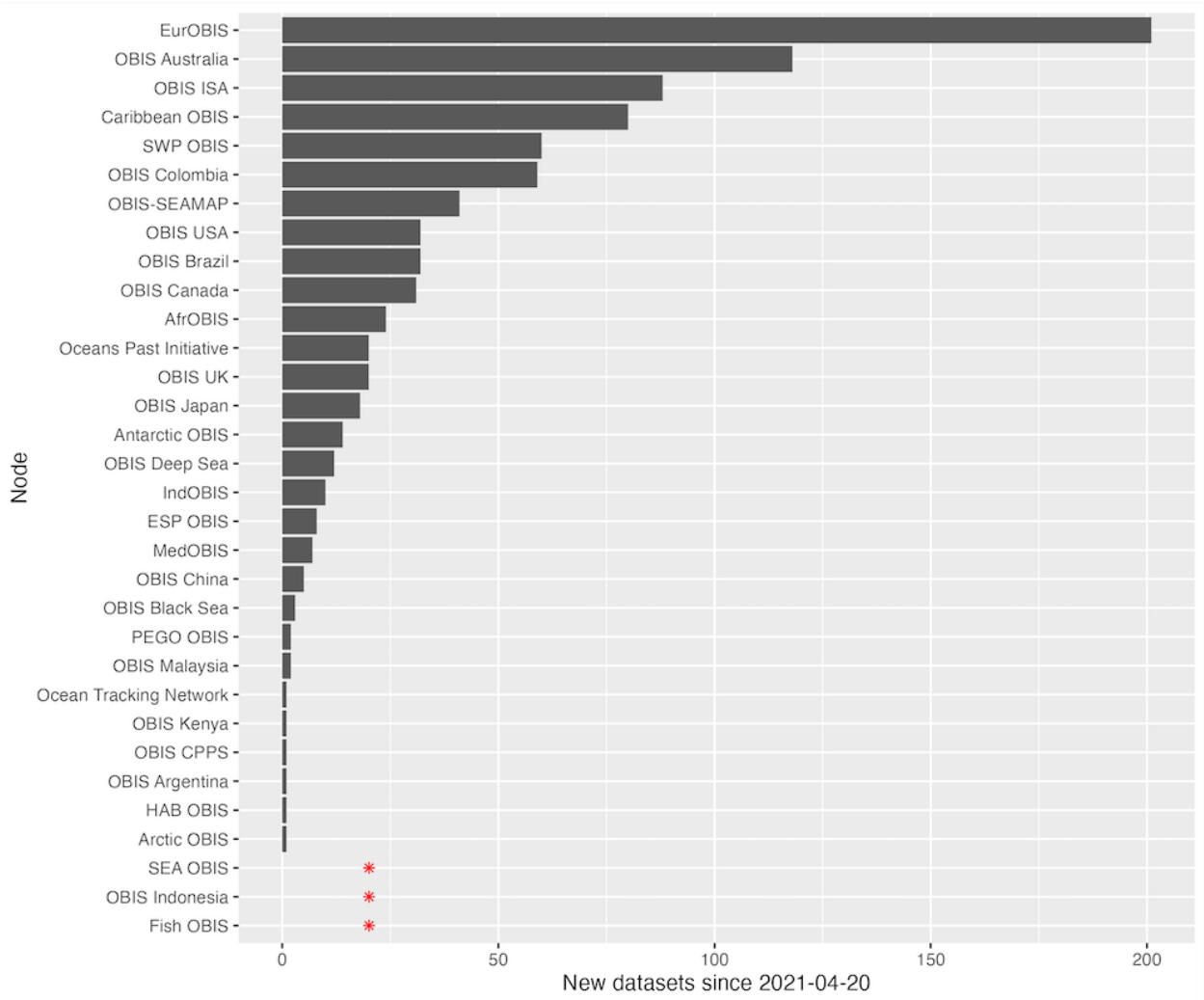
Mr Ward Appeltans reported that since our last meeting in May 2022, OBIS nodes have published 8.8 million new records of 360 new datasets, 17 million new measurements, and 23,000 new species names that were previously unreported to OBIS. This brings OBIS' total records to 108 million, measurements to 191 million, datasets to 4,779, and marine species to 180,000.

At the previous SG meeting, the OBIS nodes were asked to sign up for Slack channels, task and project teams, and ensure their email addresses are whitelisted for official communication. As of now, we have 97 members in the OBIS Slack, and most OBIS nodes are represented. Additionally, membership in various task and project teams has been updated on OceanExpert. When emails sent to sg@obis.org bounce back, the recipient is informed.

All OBIS nodes were also requested to contribute news items to the OBIS website, newsletter, and social media channels, as well as promote their OBIS node through their institutional websites. Only two OBIS nodes (OBIS-USA and MedOBIS) have provided a web article for publication on the OBIS website so far.

The OBIS secretariat keeps a record of the number of new datasets per OBIS node in order to assess the health status of the network. Any OBIS node that fails to publish new datasets for more than two years is deemed inactive. Mr. Appeltans reminded the SG of the procedures adopted at SG-OBIS-7 (2017), which stipulate that inactive nodes must submit a work plan to the SG outlining their strategy to become active once again. Failure to do so may result in the SG recommending the removal of the OBIS node from the network at the next SG meeting. Regrettably, during the 27th IODE Committee meeting, OBIS Senegal was removed from the network due to their inactive status. However, they are invited to re-join once they have the necessary capacity.

Currently, three OBIS nodes are listed as inactive (see fig 2), which are SEAOBIS, FishOBIS, and OBIS Indonesia.



The **SG-OBIS requested** the OBIS nodes identified as currently inactive (SEAOBIS, OBIS Indonesia and Fish OBIS) to submit an action plan to the OBIS Executive Committee to become an active data publishing node again, within 3 months after the adoption of the report.

2.3.2. OBIS node presentations

Mr Ward Appeltans reported that this year, the OBIS secretariat did not organize a survey to collect information on OBIS node activities. However, OBIS nodes were asked to provide a short presentation on new developments, new projects, tools or information products.

2.3.2.1. HAB OBIS

Dr Eileen Bresnan (UK), Chair of the IPHAB TT on HAIS and GHSR reported on OBIS HAB activities and developments. She reminded the SG-OBIS that during 2014-2021, the OBIS HAB node and the OBIS secretariat implemented a joint activity (funded through Flanders), which resulted in two major products:

- 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 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.
- A new Harmful Algal Information System (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 HAIS including HAEDAT and OBIS HAB, which are both hosted by IODE/OBIS.

Dr Bresnan reported that they are working on a UN Ocean Decade action called the Harmful Algal Bloom Solutions Programme (HAB-S). The programme aims to provide science-based solutions for the sustainable management and use of marine resources and ecosystem services affected by harmful algal blooms (HABs). The programme will co-create data and information products with users, engage local and indigenous knowledge holders, and ensure that early warning systems, data portals, and information products are globally accessible to users. The HAB-S initiatives include preventing, controlling and mitigating HAB events, advancing HAB observing tools and technologies, making HAB data equitable and accessible, and improving HAB literacy.

The HAB-S programme is currently seeking global and regional partners to facilitate the co-creation of initiatives in all regions, including research institutions, seafood and aquaculture industry, seafood safety authorities, tech companies developing observation hard- and software, fisheries, public health authorities, recreational/tourism interests and indigenous and local knowledge holders. Other OBIS nodes are invited to join and collaborate with HAB-S.

2.3.2.2. OBIS Antarctica

Mr Anton Van de Putte introduced a new Belspo Funded Project ADVANCE (Antarctic bioDiVersity dAta iNfrastruCture). This project will allow AntOBIS/ the SCAR Antarctic Biodiversity Portal to Partner with the Université Libre de Bruxelles (ULB), the Southern Ocean Observation System (SOOS) and the Australian Antarctic Division (AAD). It will work closely with GBIF and OBIS to achieve these results. ADVANCE's goal is to build a Virtual Research Infrastructure (VRI) for the Antarctic and Southern Ocean (ASO) area, which will turn

biodiversity data into research and policy-relevant data products.

The VRI will enable the connecting, enrichment, and valorization of heterogeneous information from multiple sources to provide insights into biological systems' responses to climate change. It will expand a well-established online data platform/OBIS node (the SCAR Antarctic Biodiversity Portal, biodiversity.aq) to meet the growing needs of the Antarctic and Southern Ocean biodiversity research community for high-quality data, services, protocols, standards, workflows, and software/applications that integrate biodiversity data with environmental data from various sources and produce research and policy-relevant outputs. These protocols, data, tools, and procedures will be available, reproducible, and transparent.
The goal is to create relevant resources for biodiversity research, such as an image library and trait databases, and applications that allow building data products based on Essential Biodiversity Variables, Essential Ocean Variables, Essential Climate Variables, and ecosystem Essential Ocean Variables (eEOVs). ADVANCE will work with SOOS, EMODnet, the AAD and OBIS and GBIF. ADVANCE will contribute directly to the objectives of OBIS2030 and look forward to working together on this with OBIS. AntOBIS welcomes input from all OBIS nodes, especially those with an interest in the Southern Ocean.

2.3.2.3. OBIS Australia

Mr Dave Watts reported in writing that over the last year, OBIS Australia has continuously added new datasets in part by searching for publications and related datasets from investigators of Australian marine projects using ORCID identifiers. Many datasets from Australian marine researchers appear in global data portals and we have spent the year checking the following amongst others: Pangaea[5] , Biological and Chemical Oceanography Data[6], Dryad[7], Zendo[8], Movebank[9] and various Australian university data repositories. Many of the global portals mentioned have data of potential use by other nodes.

OBIS-AU has crosschecked the marine datasets identified by the OBIS Data Manager in GBIF that potentially could be hosted by OBIS. We can confirm there are no outstanding datasets with any obvious Australian content or involvement.

We are holding discussions with Atlas of Living Australia (ALA) about data flows to GBIF. They wish to be the sole harvest point for OBIS-AU data to GBIF via their ALA archives. It would mean that all OBIS-AU resources would have to be de-registered in GBIF. We do have a web service that ALA can call to help identify new OBIS-AU marine datasets that they can ingest from our IPT.

Eduardo Klein is managing a project called RIMReP at the University of Tasmania that will build a data portal of Great Barrier Reef knowledge. He wants any public RIMReP biological data to

[5] https://www.pangaea.de/
[6] https://www.bco-dmo.org/
[7] https://datadryad.org/stash
[8] https://zenodo.org/
[9] https://www.datarepository.movebank.org/

be hosted by OBIS-AU so that RIMReP is able to ingest data in one consistent data format. A win-win situation as that data can be directed to OBIS, ALA etc.

OBIS-AU node has published 23 eDNA datasets with 21 million records out of 35 million total records published to OBIS. The DNA derived data extension is used along with Occurrence core. Each field names/column header from source data is mapped to DwC recommended fields following guidelines from the paper on publishing DNA-derived data[10] and examples from OBIS manual[11]. The DNADerivedData extension is not compatible with Event core in the current data model which requires any event level measurements to be linked to every occurrence record. To avoid the data redundancy, OBIS-AU is publishing only event level measurement data via a web service and the link is provided in the abstract metadata section. OBIS-AU node used Resource Relation extension to publish the eDNA dataset with sequences derived from an organism (gut content and lining) where the observation is linked to the observation of the host organism (e.g. dataset[12]).

As a part of OBIS Grand Unified Data Model Project Team (GUMPT), OBIS-AU is working on modelling the BRUVS dataset into GBIF Unified Model. The BRUVS dataset from 5 surveys at the Ningaloo Reef, Western Australia in 2019 transformed into Camtrap DP using a frictionless framework. The Camtrap DP dataset was tested in the IPT 3.0 test instance. The Camtrap DP dataset is modelled into GBIF Unified Model using schema.sql[13].

2.3.2.4. ESP OBIS

Mr Braulio Fernández reported that currently, the ESP-OBIS node has increased its records to a total of 6,674. Additionally, two new datasets have been published in the last year. On the other hand, we received two important datasets in 2022. One of them consists of over 15,000 records of benthic organisms along the Chilean coast, while the other contains data that will be published in honor of the researcher Marco Retamal. Mr. Retamal generously made all the data he collected during his years of studying crustaceans across Chile available to us. Both datasets are still being worked on. Recently, we have also received new data on copepods from two upwelling zones, namely Valparaíso and Concepción.

Since March 2022, weekly workshops have been conducted with the aim of collaborating on the obtained datasets. In these sessions, we address doubts and guide participants through the process of preparing the data in Darwin Core format.

The node has made significant efforts in education, targeting both undergraduate and postgraduate levels. OBIS has been incorporated as a module in the undergraduate course

[10] https://docs.gbif.org/publishing-dna-derived-data/1.0/en/
[11] https://manual.obis.org/examples.html#edna-dna-derived-data
[12] https://obis.org/dataset/5d206e57-370c-453f-a882-b54d517294e7
[13] https://github.com/gbif/model-material/blob/master/schema.sql

"Biodiversity in the Pelagic Environment." Students are taught about two main aspects: the roles of users and data providers.

Furthermore, a workshop on data analysis for marine biogeography was held at the University of Concepción. Currently, we are coordinating an online workshop titled "Marine Databases: Access and Standardization of Data" for the Pontifical Catholic University of Valparaíso, scheduled to take place in September.

As a result of these initiatives and various interactions, four theses (three undergraduate and one postgraduate) have integrated OBIS. Two of these theses have the objective of publishing the data they worked on, with one recently being received. The other two theses are based on data obtained from OBIS and focus on modeling and biogeography.

Regarding postgraduate education, the complementary subject "Advances in Biological Oceanography: Diversity and Pelagic Ecology" has been accredited for Ph.D. programs at the University of Antofagasta, and OBIS is included within the program.

As part of the node's activities, we are currently participating in the National Congress of Marine Science (22-26 May, Puerto Montt, Chile), where we are involved in a symposium and two poster presentations.

Finally, we have submitted two proposals to the ANID call for the Natural and Exact Sciences Millennium Nucleus 2023. Both proposals, titled "Millennium Nucleus for the Study of Deoxygenation in the Southeast Pacific Ocean (DEOXS)" and "Millennium Nucleus on Marine Biogeography (MaBI) for Biodiversity Conservation and Bioresource Management of the Southeast Pacific Ocean," incorporate OBIS.

2.3.2.5. Caribbean OBIS

Ms Carolina Peralta reported in writing that the Node has been active for the past session, receiving data mainly from Mexico and has been significantly enriched with new data coming from the Biodiversity Information for Development programme, through the data mobilization project “Rescuing the knowledge base of Venezuela's marine biodiversity”, coordinated by the Caribe Sur Foundation and funded by the European Union and managed by GBIF. More than 42,000 new records (mainly Sampling event) and 67 datasets were published after one year of data providers training, data preparation and follow up. Most of the occurrences were registered in Marine Protected Areas (63.47%) and a total of 3,041 species were recorded. Historical datasets have been rescued, extending the node temporal coverage from 1979 to 1822.

The Node has a new data manager from Universidad Central de Venezuela, Ms. Jeannette Perez (Welcome!); the node now has 3 people in charge of data stewardship. The team has been advancing in datasets quality control workflow by defining our step-by-step processes for checking datasets. We also defined a standardized formal report to get back to data providers, see an example here.

The Caribbean OBIS Node is aware that some datasets need to be reviewed and fixed. Checks for dropped records, e.g. no WoRMS match, invalid eventDate is still an ongoing task.

The Caribbean OBIS Node has supported providers from the region by working on engagement initiatives and by providing support for data processing and training, especially for new data providers from Venezuela (14 researchers from more than 10 institutions) that have engaged with OBIS after the Caribe Sur - GBIF data mobilization project.

The node has been contributing to external communication by the creation of a Twitter account: @CaribbeanOBIS (soon a web page will be launched).

2.3.2.6. MedOBIS

Since the beginning of 2023, MedOBIS has established a connection to an open service called Data Services[14], which is an updated LifeWatchGreece service available through the Metadata Catalogue of LifeWatch ERIC. This Service offers the user the opportunity to a) search about datasets of interest by providing an efficient way of querying semantic networks. The user can search datasets (through MedOBIS Repository) by using keywords such as the region of interest e.g. Aegean Sea or the date e.g. 2000; and b) query and browse over the contents of the semantic network in an interactive manner, as well as using standard querying languages (i.e. SPARQL).

In addition, MedOBIS recognises the difficulty in collecting data - especially historical data- while at the same time there is an enormous amount of (meta)data waiting to become FAIR (Findable, Accessible, Interoperable and Reusable). To address this, MedOBIS has invested in citizen science data rescue activities. These activities aim to involve the public in contributing to data collection efforts, particularly for historical data. Additional information about these activities can be found at https://obis.org/2022/09/07/zooniverse/. MedOBIS plans to continue expanding these initiatives in the coming years e.g., a Citizen Science Workshop on rescuing historical datasets.

MedOBIS participated in both International Ocean Data Conferences - I and -II (IODC-I and IODC-II), for more information see here :https://oceandataconference.org/files/81_OceanDataConference2022.pdf and https://oceandataconference.org/wp-content/uploads/2023/03/47_MAPWORM-Poster.pdf.

Finally, until recently, MedOBIS used the IPT version 2.3.4 The process of establishing a newer IPT version is considered necessary as it will solve many technical and standardization issues. This process is in progress, as a backup environment is already created before establishing the new version.

[14] https://www.lifewatchgreece.eu/?q=content/data-services

2.3.2.7. OBIS Canada

Ms. Maria Cornthwaite reported in writing that approximately 20 datasets were published on OBIS Canada in 2022. Half of these datasets originated from the Government of Canada/Fisheries and Oceans Canada, primarily from the Quebec region, while the other half were published by the Hakai Institute, a non-governmental organization.

The OBIS Node Manager continues to be provided by the Government of Canada / Fisheries and Oceans Canada (DFO). There are currently no funded positions or projects in DFO specifically related to OBIS, although OBIS is widely promoted within the Department and many individual programs are working on publishing data. The node manager role is carried out in addition to the duties of a full time position, so it is challenging to do more than provide a very basic level of support to the OBIS Canada community.

2.3.2.8. EurOBIS

Mrs Leen Vandepitte reported in writing that the EurOBIS node keeps focused on making available marine biodiversity datasets, either from within Europe, or outside of Europe but with a link to Europe. Where possible and feasible, EurOBIS collaborates with other nodes to enhance data sharing and data quality assurance (e.g. Caribbean OBIS, OPI-OBIS, OBIS UK, MedOBIS, and OBIS Kenya). Continuation of the EurOBIS activities are currently funded through the LifeWatch project, as well as the EMODnet Biology project, the latter entering a new Phase this month. The integration of imagery-based data and DNA-derived data will also take off, as soon as needed adaptations have been implemented on the EurOBIS infrastructure.

The EurOBIS data management team coordinated the development of the online, self-paced OTGA training course ‘Ocean Data Management’, which was first launched last year and is being offered again this year. Over the Summer, an additional OTGA training course will be developed, ‘Biological Data Management’. The first internal meetings took place, and collaboration will be sought with OBIS, to make maximum use of already existing training material, e.g. the series of OBIS training videos.

In collaboration with the WoRMS data management team, the EurOBIS team works on solving and annotating the OBIS non-matching names, as an in-kind contribution to OBIS, which is a major task, however without dedicated funds and staff time to work on.

2.3.2.9. OBIS Malaysia

Mr Izwandy Idris reported in writing that a new additional data manager for the node has been hired by INOS-RRC (OBIS Malaysia host). Mr Ahmad Fakhrurrazi Mokhtar was appointed as science officer for RRC. One of his tasks is to act as third data manager for OBIS Malaysia. Generally he is still in the learning process to understand the workflow of dataset preparation. Nevertheless, Mr Mokhtar has uploaded one dataset in April 2023 and has planned for scheduled datasets to be uploaded to the IPT later this year.

2.3.2.10 OBIS Kenya

Dr Nina Wambiji reported in writing that VLIZ will be hosting a training workshop in Mombasa from 7th - 9th June 2023 on 'Data publication for scientific research'. This is geared to help in the data publishing process. The training will be held at Kenya Marine and Fisheries Research Institute, Mombasa, Kenya. It will also be part of the Ocean Teacher Global Academy support to KMFRI. Sixteen scientists have been identified to attend the training.

During the Seventh Session of the IOC Sub Commission for Africa and the Adjacent Island States (IOCAFRICA) held in Nairobi, 15-17 March 2023, it was proposed that additional regional (and national) OBIS nodes be established to address the current gaps on biodiversity data in the region.

In 2022, IOCAFRICA in partnership with The Ocean InfoHub (OIH) Project have met with stakeholders to reactivate ODINAFRICA as the African regional node for OIH project. By extension these processes then will feed into WoRMS and OBIS databases.

2.4. OBIS Task Teams

2.4.1. OBIS Strategic Advisory Task Team

No activities were reported.

For information, the OBIS Strategic Advisory Task Team was established at the 7th OBIS Steering group meeting in 2018, and replaced the OBIS Science Advisory Task Team which was established at the 3rd OBIS Steering group meeting in 2013. The Terms of Reference of the SATT are:

- Provide advice to the OBIS Steering Group on the OBIS science mission, policy and management relevance and strategic priorities.
- Identify new directions, potential pilot projects and areas of development for data-driven research and ocean policy and management applications.
- Be composed of a broad range of experts from relevant scientific disciplines and institutions with expertise in fields such as marine biodiversity, biogeography, ecology and ocean policy and management.
- Convene periodically with at least one meeting per year.
- Review OBIS directions and research and development activities, as well as investigate timely topics to help set future strategic directions.
- Provide reports to the OBIS Steering Group.
- Act as liaisons to other scientific institutions and related communities of practice.

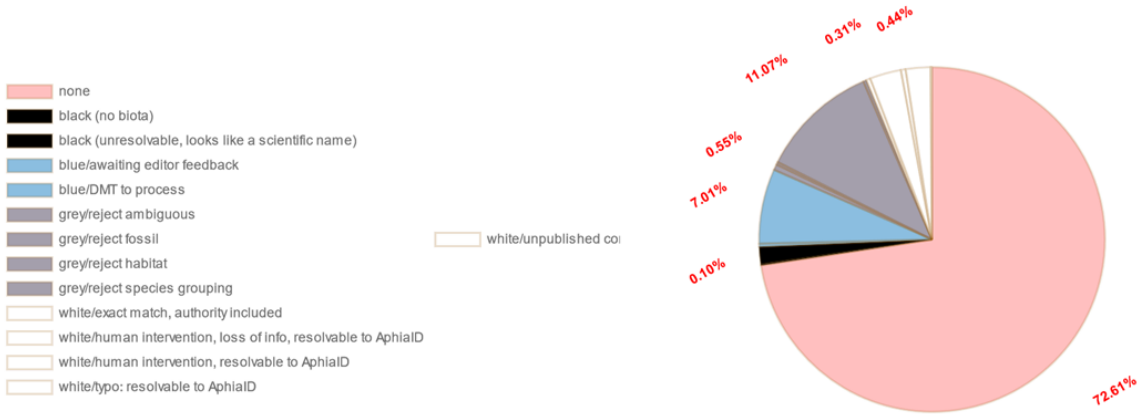
The **SG-OBIS directed the IWG-OBIS-Structure** to reconsider the tasks of the OBIS Strategic Advisory Task Team (SATT) in the new OBIS management structure and **decided** to abolish the current SATT.

2.4.2. OBIS Taxonomy Task Team

Mrs Leen Vandepitte reported that work on non-matching names has not progressed since last Summer (2022) due to lack of time within the WoRMS Data Management Team.

However, the “OBIS annotated names” application has been launched and used internally within VLIZ, making the annotation process easier and more straightforward, both for sending annotations to OBIS, as well as annotating non-matching names. A manual still needs to be written. Once that is completed, other people (outside of VLIZ) will be able to participate in the annotation process of the OBIS-names.

Currently, 43,031 taxon names are documented in the “OBIS annotated names” application, of which 31,251 (73%) have not yet received an annotation.



The **SG-OBIS reminded** the nodes that the WoRMS data management team at info@marinespecies.org can and should be contacted in case no matching name in WoRMS can be found, ideally before publishing the dataset to OBIS.

2.4.3. OBIS Capacity Development Task Team

Ms Carolina Peralta reported that the OBIS CD-TT has been working on the core training tutorial document and how-to videos have started to be developed (see 2.2.3). In collaboration with the OBIS Secretariat Training Officer, the team reviewed training content that updated the OBIS Manual with a more step-by-step backbone, based on 64 training topics. How-to videos were created and will have their audio tracks translated to other languages (e.g. Spanish) by members of this team.

The CD-TT has supported three OBIS training courses and workshops:

- Marine Biological data mobilization workshop,
- a GBIF-led Capacity Enhancement Support Programme titled Expanding the Network: Bringing Marine Research Stations and Library Collections into the Data-Sharing Community, and
- CaribeSur-GBIF data mobilization project by providing module content and serving the course participants.

The OBIS CDTT web page (https://obis.org/training) has been updated with a slightly new structure and content, however we feel like a more overall restructuring of the OBIS website might help in making some of our activities and communication channels more visible.

The current OBIS training action plan 2017-2021 expired and Ms. Carolina Peralta presented a proposal to adopt a new OBIS CD strategy, focused on regional-level work (see Annex 3).

As part of the OTGA Regional Training Centre at INVEMAR, OBIS Colombia will organize an OBIS Training course in September 2023 and will translate the new OBIS training course on the OTGA platform developed by Elizabeth Lawrence, into Spanish.

The ISA-OBIS will organize a training course in October 2023 and will consider using existing online OBIS training material, but raised the need expressed by its partners to have hands-on in-person training courses.

OBIS Malaysia recommended new node (data) managers and inactive nodes to follow the OBIS training course and suggest a training certificate to become a requirement for OBIS nodes. The **SG-OBIS directed** the IWG-OBIS-Structure to consider this suggestion.

Mr Ward Appeltans asked if the IOOS/OBIS-USA training material is compatible with the new OBIS training course on OTGA? Dr Elizabeth Lawrence (OBIS Sec) who developed the OTGA training course and who also supported the Marine Biological data mobilization workshop (IOOS and OBIS-USA) replied that the training materials developed for the IOOS/OBIS-USA workshop can be replicated for similar hands-on workshops for participants with datasets requiring standardization. These materials provide a broad introduction towards data mobilization, containing some exemplary exercises as well as R and Python code examples. This workshop complements the more comprehensive OBIS training course on OTGA in that it focuses more

on actions to take during standardization, whereas the OTGA OBIS training course also provides more conceptual explanation.

The **SG-OBIS agreed** on the proposed new 5-year OBIS CD strategy (2023-2027) and **requested** the OBIS Secretariat to publish this on the OBIS website, and **SG-OBIS requested** the IWG-OBIS-Structure to consider this plan in the new structure.

2.4.4. OBIS Communication and Outreach Task Team

Dr John Nicholls reported that the OBIS Communications and Outreach Task Team did not generate any direct presence during this reporting period. Engagement with other Task Teams was an activity where the COTT was involved in interactions with team members and processes. For example, regular attendance by the COTT chair of meetings of the Data Quality Control Project Team, the Capacity Development Task Team, the Historical Data Project Team and the Grand Unified Data Model Project Team fostered integration.

The overall ambitions of the COTT were not met; regular meetings were not held and development of materials and sources for SG members were not realized.

Dr Nicholls recommended that this Task Team should establish a work programme that can be realistically met in future by adopting one or more of the following possibilities:

- SG-OBIS to elect either a new chair, or add a co-chair to enable the continued facilitation of the Team
- SG-OBIS to identify a series of tasks relevant for the processes of the COTT
- SG-OBIS to poll for willing and active members to join the Team who are able to participate and actively engage in meetings and activities; it is suggested that at least 8 members will be required to fulfill the basic requirements of the various roles of the Team

The **SG-OBIS recognized** the need for a well-crafted OBIS outreach and communication plan, which must be developed in collaboration with a communication expert. The significance of effective communication cannot be overstated. The plan should help in showcasing the immense potential of OBIS, thereby elevating our profile and helping increase funding opportunities for the OBIS nodes.

The **SG-OBIS established** an IWG on developing an OBIS Communication and Outreach Plan and **instructed** this group to start work after the conclusion of the IWG on OBIS management structure.

The **SG-OBIS expressed** its gratitude to John Nicholls for his dedication to the OBIS Communication and Outreach Task Team over the years. We are particularly appreciative of his proactive efforts in organizing monthly online meetings during the challenging period of the COVID-19 pandemic. These meetings played a pivotal role in ensuring the continued

involvement and active participation of our community, paving the way for numerous monthly task team and project team meetings afterwards.

2.5. OBIS ad-hoc Project Teams

2.5.1. OBIS Data Quality Control Project Team

Mrs Yi-Ming Gan reported on the activities of the OBIS data QCPT. She announced that Ruben Perez Perez (EurOBIS) assumed the co-chair position for the QCPT in December 2022. Mrs Gan added that the project team aims to conclude its work by the end of 2023.

Task: OBIS user survey

The OBIS user survey was launched. The results were discussed under agenda item 2.2.2 (technical developments) by the OBIS data manager.

Task: Provide recommendations for issues mentioned in data laundry reports and monthly node presentations and respond to related GitHub issues.

The project team initiated node presentations during the monthly QCPT meeting to enable discussions and support on data quality issues encountered by nodes. Six OBIS nodes (Yi-Ming Gan - AntOBIS, Abby Benson - OBIS-USA, John Nicholls - OBIS-OPI, Sachit Rajbhandari - OBIS-Australia, Georgia Sarafidou - MedOBIS and Braulio Fernandez - ESP OBIS) presented their data quality process and challenges encountered. These meetings proved to be an excellent forum for knowledge sharing and collaborative problem-solving. Special attention was given to issues related to:

- On-land QC flag
- ScientificNames (unknown taxa, vernacular names, temporary names, confidence of identification
- Dates (invalid dates, historical dates)
- Depth values in relation to bathymetry

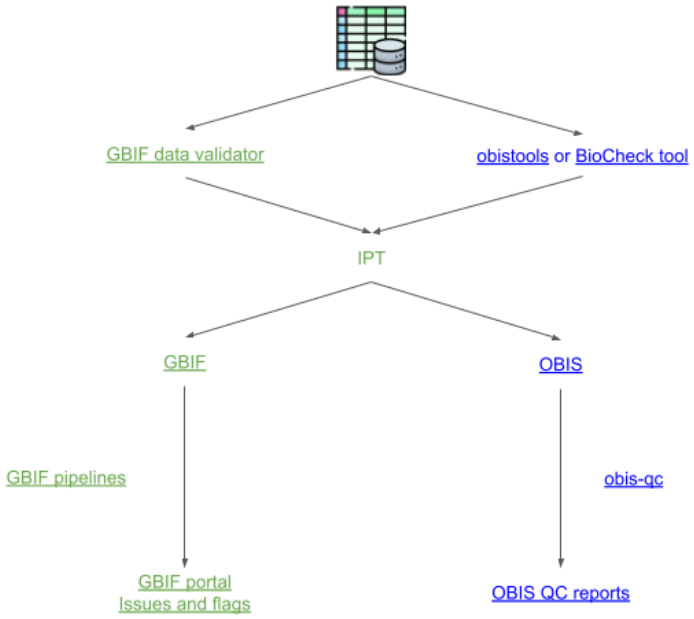
The QCPT keeps track of these issues in a dedicated GitHub repository: https://github.com/iobis/quality-taskteam/issues

The OBIS QCPT expressed its appreciation to Mrs Yi-Ming Gan for chairing these meetings and thanked the OBIS Secretariat, especially Serita Van Der Wal in providing support. However, due to the lack of time and overwhelming tasks, the QCPT decided to discontinue node presentations during the monthly sessions in 2023 and focus on the next task.

Task: Review tests and assertions from TDWG and OBIS QC pipelines for the fields related to issues raised in data laundry reports and monthly node presentations.

A joint online meeting between OBIS QCPT, OBIS Historical Data Project Team, OBIS Secretariat, GBIF Secretariat and TDWG Biodiversity Data Quality (BDQ) task group 2 (TG2) was held on 3 February 2023. The outcomes of this meeting were:

- OBIS QCPT will align the QC tests of a chosen QC tool to the 99 core tests developed by TDWG BDQ TG2 by deciding the parameters of the core tests to suit OBIS data.
- GBIF incorporated a link to LifeWatch & EMODnet Biology QC tool in a dialog box when users select to add their dataset to OBIS network on IPT. This feature is available since IPT version 2.7.3.
- Different tools and data flagging approaches for OBIS and GBIF pre and post data publication are listed here. (see image below)



After discussing with the maintainers of different OBIS QC tools, QCPT settled on aligning the QC tests from obis-qc (OBIS Secretariat) with the TDWG core tests. Considerations taken include ease of implementation, scalability, maintenance and ease to be incorporated by other tools. QC tools that were considered are the following:

- obis-qc - developed and maintained by OBIS Secretariat, generates QC reports for https://reports.obis.org/
- obistools - R package developed and maintained by OBIS Secretariat to QC data.
- LifeWatch & EMODnet Biology QC tool - developed by Lifewatch and maintained by the EMODnet Biology data management team at VLIZ (EurOBIS), runs obistools behind the scene and have custom tests specific for BODC vocabularies and some DwC terms, as well as offering a visual exploration of a dataset with plots and tables.

Discussions and comparisons of different QC tests are documented as obis-qc issues on GitHub.

Task: Liaise with CDTT and COTT to assist in developing and identifying events, issues and training opportunities

By attending the monthly QCPT meetings, the OBIS training officer gained valuable insights into common QC issues faced by the team. These insights proved to be beneficial for her in developing effective training tutorials.

Task: Review quality issues of OBIS datasets from GBIF and explore solutions.

Since the release of IPT 2.5.2, publishers can select the networks their dataset belongs to in IPT. GBIF and OBIS recommend that all marine publishers select OBIS where appropriate. The OBIS secretariat lists those marine datasets that are not yet in OBIS as issues to this GitHub repository (https://github.com/iobis/obis-network-datasets) and indicate which OBIS node(s) should endorse this dataset. Once endorsed, OBIS will harvest the dataset directly from the source IPT and list it on the OBIS node page.

So far, 350 datasets were published as “OBIS” datasets. Of those 350 issues, 234 are closed and 116 are still open. The OBIS secretariat asked the OBIS nodes to provide the GitHub account per node to be used to notify the OBIS node. Only 10 OBIS nodes responded and the QCPT reminded the other OBIS nodes to respond.

Several of the open issues deal with taxon checklist datasets, which OBIS cannot handle yet. Also 49 datasets are from OGS in Italy and EurOBIS responded that OGS will remove them from GBIF and that EurOBIS will be the primary source for these datasets.

Mrs Gan continued that the QCPT encounters several challenges:

- Lack of funding for project team members, leading to a reduction in commitment levels of some members.
- Overwhelming tasks in the initial scope of the project, resulting in the team reducing the scope to focus only on aligning QC of obis-qc with TDWG core tests and GBIF pipelines.
- The QCPT does not have the capacity to compare QC from different existing tools to align with the TDWG core tests and GBIF pipelines, which may result in divergence of QC approaches between obis-qc and other tools.

The **SG-OBIS called** on all OBIS nodes to create GitHub accounts, and follow these OBIS GitHub repositories:.

- https://github.com/iobis/obis-network-datasets
- https://github.com/iobis/obis-issues
- https://github.com/iobis/manual

The **SG-OBIS expressed** heartfelt gratitude and are immensely appreciative of the time and effort Mrs Yi-Ming Gan has put into the OBIS Data Quality Control Project Team, showing strong

leadership, unwavering dedication, and tireless perseverance. The work and contribution of this project team provides tremendous value to OBIS and the **SG-OBIS strongly encouraged** the team to continue with the proposed actions until the proposed end in December 2023 and **requested** all OBIS nodes to contribute and join this activity.

2.5.2. OBIS Vocabulary Infrastructure Project Team

Dr Elizabeth Lawrence reported on the activities of the OBIS Vocabulary Infrastructure Project Team. Good progress has been made on developing decision trees to assist data providers and nodes with choosing the most appropriate measurementTypeID, measurementUnitID, and measurementValueID codes. Instead of one decision tree for measurementTypeID, the team is developing a larger decision tree that focuses on providing guiding questions (see Annex) to help users understand the component elements of their measurement so that they may choose the correct vocabulary.

The team suggested a revision of the Terms of Reference of the OBIS-VIPT to:

- Report and collaborate with existing vocabulary-related activities of GBIF and the Biodiversity Information Standards (TDWG) group as appropriate
- Produce guidelines (decision trees, video tutorials) for mapping Measurement or Fact terms in Darwin Core with the preferred BODC collection and publish this as part of the OBIS manual
- Build and maintain an efficient communication channel to coordinate with community members on missing or incorrectly mapped vocabularies, including training events

The team hosted one Data Vocabulary Laundry event in July 2022 and would like to propose running more events in 2023 with the aim of helping OBIS nodes and data providers add or check measurementTypeIDs for already published datasets. The team is also assessing how frequently the OBIS community makes use of the Q01 collection, which provides codes for sampling instruments and methods.

The OBIS-VIPT would like to continue the project team and for the next year, wants to focus on finishing training documentation, then testing the implementation and communication regarding vocabulary training events and resources, so that improvements in measurementTypeID usage can be assessed.

The **SG-OBIS agreed** on the proposed new Terms of Reference, and **thanked** Elizabeth Lawrence for her invaluable and proactive support to the OBIS-VIPT. The **SG-OBIS recommended** the OBIS Vocabulary Infrastructure Project Team to continue with the proposed actions, **taking note** that a chair needs to be appointed, and if support from the OBIS Secretariat is available.

2.5.3. OBIS UN Ocean Decade Project Team

Mr Ward Appeltans reported on the activities of the OBIS UN Ocean Decade Project Team. The unspent budget allocated for the 2022 SG meeting was repurposed to sponsor a workshop to write our OBIS Decade proposal. The OBIS Decade Proposal writing meeting took place on 6-7 October 2022 and was hosted by the secretariat in the new office building in Ostend. 18 Participants representing 11 OBIS nodes and the secretariat participated in the meeting. The meeting concluded with a plan for OBIS 2030 and was then submitted to the Decade Coordination Unit by the secretariat as a UN agency project proposal. The proposal was endorsed on 14 March 2023. OBIS2030 will be further discussed under agenda item 3.2 (future activities).

The **SG-OBIS thanked** the members of the OBIS UN Decade Project team for delivering a strong proposal and **welcomed** the endorsement of OBIS 2030 by the UN Ocean Decade.

2.5.4. OBIS Historical Data Project Team

John Nicholls and Georgia Sarafidou reported on the activities of the OBIS Historical Data Project team (HDPT). The HDPT was established to develop processes and procedures within the OBIS historical research community that could aid in providing clarity and simplicity in the use of the DarwinCore standard. The unification of approaches for Historical, Archaeological and Paleontological data was considered as a fundamental step for a successful inclusion of DarwinCore. The HDPT also sought to address issues raised by members and the community as a whole and raise the awareness of historical data as a vital aspect of OBIS. In this context, the HDPT has engaged with other Project and Task Teams (such as the Data Quality Control Project Team) in order to share and develop outputs in a cooperative and useful manner. Use cases of challenging historical datasets were presented and their particularities were shared and examined.

The HDPT has addressed questions around temporal values, especially relating to the eventDate field in DarwinCore. With the invaluable support and cooperation of Pieter Provoost, these matters have been resolved and historical data may now be added to OBIS without the issues, for example, of negative values and year zero complications conflicting with OBIS schema data.

There are still various issues that will need to be addressed on an ongoing basis, such as the correct use of the DwC Chronometrics Extension that can enable non-standard temporal data to be recorded. It is recommended that these issues will be best served by incorporating them into the work of the DQCPT - which has worked well so far. It is recommended that the function of the HDPT is suspended.

The **SG-OBIS thanked** John Nicholls and Georgia Sarafidou for chairing the OBIS Historical Data Project Team (HDPT), and the support from Pieter Provoost in developing recommendations for historical data and **decided** to close this project team.

The **SG-OBIS requested** John Nicholls and Georgia Sarafidou to write a news article on the outcomes of the OBIS Historical Data Project Team (HDPT) in which OBIS can also invite the archeological community to publish historical data to OBIS.

2.5.5. OBIS Grand Unified Data Model Project Team

Ms Yi Ming Gan (on behalf of GUMPT chair Ms Abby Benson) reported on the activities of the OBIS Grand Unified Data Model Project Team (GUMPT). The focus of the project team is to explore early adoption and testing of the new data model to assess how well it works for OBIS community data, noting and sharing back to the data model team any problems encountered, suggestions for improvements, and feasibility of uptake.

The project team has met eight times since the team was formed in May 2022 and meetings are held twice per day to better accommodate different time zones across the OBIS network. The project team completed the first four tasks identified including selecting six use cases to focus our efforts on (eDNA barcoding, Camera trap, Specimens with media, Environmental and community measurements, Taxonomic checklist, and Ecological survey data exchange specification), identifying datasets not covered by any of the use cases, and working up two datasets to the conceptual model. One outcome from these efforts includes an absence use case developed with the Humboldt Extension Task Team for better representation of monitoring data, including absences. The project team is taking a short hiatus to allow finalizing of the two datasets and next will be documenting issues and suggestions for the two use cases and assessing potential impacts to the OBIS data system. Findings will be documented in a report and shared with SG-OBIS, TDWG, GBIF Global Nodes and the GBIF data model project team.

The **SG-OBIS thanked** Ms Benson and Ms Gan and the project team for the progress made in the OBIS Grand Unified Data Model Project Team and **agreed** to continue the proposed activities and **requested** the project team to report back at the next SG-OBIS meeting.

2.6. Collaborations and partnerships

2.6.1. GOOS BioEco and MBON

Mr Ward Appeltans introduced this agenda item and reminded the SG-OBIS that in 2016, an agreement between GOOS BioEco, OBIS, and GEOBON MBON was established to coordinate a global marine biodiversity observing system[15], aiming to build a unified and globally consistent observing system. The system would strengthen the three initiatives, utilize the best available resources, share expertise, and ensure compatibility. The purpose of this coordinated global ocean observing system is to assess the state of the ocean's biodiversity in order to effectively conserve and sustainably use marine life. The agreement outlined specific actions, such as developing essential ocean/biodiversity variables, advancing long-term biological ocean observations, supporting data sharing and aggregation, fostering regional support, and enhancing communication and capacity-building efforts.

Mr Appeltans requested that the SG-OBIS reflect on the current cooperation and consider whether a renewed commitment is necessary, as well as identifying any potential changes or questions that may need to be addressed after some more information was provided on MBON and GOOS joint activities.

Marine Biodiversity Observation Network (MBON)
The collaboration with MBON has primarily focused on implementing the Framework for Ocean Observing, standardizing the Bio-Eco EOV, and promoting data flow to OBIS. Efforts also include developing indicators that integrate single EOV sub-variables or multiple interdisciplinary EOVs into Essential Biodiversity Variables. This involves testing and validating biogeographic frameworks, developing species distribution models, and merging novel datasets into indicators.

MBON has also worked closely with OBIS and GBIF to advance and promote data formatting standards, metadata, and other related topics through joint Data Mobilisation workshops. The aim is to expand the number and reach of these workshops into formal education processes (classroom at different education levels), so that more people learn about managing data and data flows.

The partnership between MBON and OBIS has been instrumental in engaging with the UN Decade of Ocean Science for Sustainable Development, particularly through the Marine Life 2030 program. This program coordinates biodiversity activities with other Ocean Decade actions and seeks to bring new groups into the dialogue, providing more visibility and engagement to OBIS. Currently, the partners are participating in the new Ocean Decade visioning process, specifically on Ocean Decade Challenge 2, which will be unveiled as a white paper in Barcelona. This process has just begun, and would like to invite an OBIS representative to this.

Global Ocean Observing System (GOOS) Biology and Ecosystems

[15] https://obis.org/2016/12/15/goosgeobonobis/

The OBIS secretariat has been providing technical support and assistance to the recently launched BioEco portal of the Global Ocean Observing System (GOOS) which can be accessed at https://bioeco.goosocean.org. This portal provides a global view of 635 monitoring programs of biological and ecosystem ocean observations through an interactive map. Each program's information includes variables observed, status, data standards, specifications used to collect observations, and the program's observing capability (or readiness level). GOOS aims to establish an automated flow of data and metadata from ocean observing programs to data management systems such as OBIS and the BioEco portal. By 2025, GOOS aims for 90% of active BioEco monitoring programs to have updated entries in the portal, with 80% having established data flow connections to OBIS. By the same year, the portal aims to establish a live connection with the GOOS monitoring and support facility hosted by OceanOPS in Brest, facilitating the linkage of BioEco observation information to the annual Ocean Observing System Report Card, which assesses the status of the ocean observing system.

The **SG-OBIS reconfirmed** the importance of our collaboration with GOOS and MBON, which also provides a high profile to OBIS, and **requested** the OBIS secretariat to regularly report and provide information or guidance on how OBIS nodes at local level can be more engaged and contribute to these initiatives. The **SG-OBIS also requested** OBIS nodes who already collaborate with these initiatives at local level, and benefit from this established partnership between OBIS and MBON and GOOS, to further championing, crediting and promoting OBIS.

2.6.2. GBIF

This agenda was introduced by Tim Hirsch (GBIF secretariat). GBIF recognises OBIS as its marine thematic network and it is in the interest of GBIF to strengthen and support its domain expert networks in order to fulfill its mandate to facilitate free and open access to biodiversity data in all domains.

At the 29th meeting of the GBIF Governing Board (Brussels, Belgium, 2-6 October 2022), the GBIF governing board requested the GBIF secretariat to develop a marine strategic plan in collaboration with OBIS. The coordinated effort relies on a thematic approach similar to those GBIF has developed for soil[16], DNA[17] and health[18].

Dr Hirsh reminded the SG-OBIS that in 2020, OBIS and GBIF renewed their 5-year cooperation agreement[19] to promote further cooperation across a wide range of activities and services between the two global biodiversity data networks, including technical collaboration covering data standards, publishing and processing; shared training opportunities and aligned documentation; and institutional collaboration to ensure closer ties between the secretariats, OBIS and GBIF nodes. This has led to capacity building projects (through GBIF´s Capacity Enhancement Support (CESP) and Biodiversity Information for Development (BID)

[16] https://www.gbif.org/soil
[17] https://www.gbif.org/dna
[18] https://www.gbif.org/health
[19] https://obis.org/2020/09/07/obis-gbif/

programmes), the development of the OBIS Grand Unified Data Model Project Team, and updated DNA-derived data publication guidelines. Both networks recognized they would benefit from more streamlined ways of publishing data to reduce the discrepancies. However, overlap between marine species occurrence data between GBIF and OBIS is often still small e.g., only 18% in the case of marine mammals.

The draft GBIF marine strategic plan will include a proposed action plan that aims to implement and support the GBIF-OBIS cooperation agreement and GBIF is asking input from the OBIS network in identifying and endorsing these actions.

The **SG-OBIS took note** of GBIF's plan to develop a marine strategy following previous steps to develop thematic portals or communities of practice for other domains, and **welcomed** the request from the GBIF governing board to collaborate with OBIS.

The **SG-OBIS reconfirmed** the importance of a strong collaboration between OBIS and GBIF and **agreed** that there are areas where strong collaboration and joint actions should be undertaken, but also **expressed concern** about how this can be implemented with the current level of resourcing at OBIS and on equal terms as long as there remains a strong imbalance of Member States' funding allocated to GBIF vs OBIS (30 FTE vs only 1 FTE).

The **SG-OBIS also expressed** the importance of OBIS and its OBIS nodes to remain recognized, also within the GBIF community, in providing unique expertise and specialized services to the marine community.

The **SG-OBIS requested** the secretariats of GBIF and OBIS to plan an in-person meeting early 2024 to develop an action plan for adoption at the next SG-OBIS meeting.

The following OBIS nodes expressed interest in participating in this OBIS-GBIF planning meeting: AntOBIS, Caribbean OBIS, EurOBIS, OBIS-UK, OBIS AU, ISA-OBIS

2.6.3. LifeWatch ERIC

LifeWatch ERIC is a European Research Infrastructure Consortium providing e-Science providing ICT tools, services & VREs to scientists investigating biodiversity and ecosystem functions and services. LifeWatch ERIC was established as a European Research Infrastructure Consortium by the European Commission in 2017.

LifeWatch recognizes the need to scale up capacity to increase "Fairness" of marine biological data and would like to establish a cooperation agreement with OBIS. The plan is to organise a joint training course by leveraging existing OBIS training content and utilising the OTGA e-learning platform. It is recommended that this LifeWatch funded activity be developed in close collaboration with VLIZ/EMODNET/EurOBIS to ensure the training course can address international but also specific needs within the organizers' networks.

Implementing a joint training course will align partners to international guidelines developed by OBIS, and reduce the need for developing and maintaining self-serving training content.

The **SG-OBIS welcomed** the proposed collaboration with LifeWatch ERIC on organizing an online OBIS training course and **requested** the OBIS Secretariat to enter into an agreement.

3. New Activities

3.1. eDNA and OBIS

Dr Saara Suominen introduced this agenda item. Environmental DNA has become a very popular method and there is likely an increased requirement for OBIS nodes to develop the capacity to manage data based on eDNA. In addition, the DNA derived data extension has many specialized fields whose purpose may not be clear without specialized training. The OBIS secretariat would like to hear from the nodes if there is a need for an intersessional working group, and what would be the most helpful and provide the most support in adding DNA derived data to OBIS? Do we want to establish an OBIS IWG on DNA derived occurrence data to exchange experience, train OBIS nodes in data standards and bioinformatics pipeline.

The **SG-OBIS established** an Intersessional Working Group IWG on DNA derived occurrence data. The purpose of the IWG will be to exchange experiences, discuss changes and guide OBIS nodes in the sharing of DNA derived data. The purpose of this IWG will be to provide a community to discuss these matters and work together in formatting datasets derived from DNA. This will be done through (online) workshops and shared communication channels (e.g. Slack) preparing use cases and sharing codes. The results of these working meetings will be considered for the Capacity Development action plan in order to feed or complement the training content (manual, videos, OTGA training courses, etc.) and training strategies.

The membership of the IWG-DNAdata is open to anyone interested in publishing DNA-derived occurrence data to OBIS or has an (e)DNA project with an OBIS node.

The following OBIS nodes expressed interest: EurOBIS, ISA-OBIS, MedOBIS, OBIS-OPI, OBIS-AU, IndOBIS, OBIS-Colombia, AntOBIS, ESP-OBIS, Caribbean OBIS, OBIS Canada, OBIS-UK, OBIS Japan.

3.2. New OBIS management structure

Mr Ward Appeltans introduced this agenda item. As emphasized in item 2.1, OBIS has transitioned from a project to an integral component of the IODE programme. Furthermore, the IODE has recently adopted new rules of procedures and has directed OBIS to incorporate these

guidelines into their management structure prior to the upcoming meeting of the IODE Management Group in December 2023 or January 2024. This is also an opportunity for OBIS to revise its management structure and rules of procedure, its governing mechanism and responsibilities of the secretariat, chairs, nodes, task teams and project teams.

The **SG-OBIS decided** to establish an Intersessional Working Group on developing a new OBIS management structure and working methods to be in line with the new rules and procedures for IODE programme components. The new structure will be proposed and recommended by the SG-OBIS for adoption by the IODE Management Group at its upcoming meeting Dec 2023/Jan 2024.

Terms of Reference of the IWG OBIS-Structure:

- Revise and propose a new OBIS management structure and rules of procedure, its governing mechanism and responsibilities of the secretariat, chairs, nodes, task teams and project teams, and steering group in line with the new IODE rules of procedure.
- Submit a report to the SG-OBIS before the end of November 2023. The SG-OBIS can then put forward a recommendation to the IODE-MG (Dec 2023/Jan 2024).

The following OBIS nodes expressed interest: OTN-OBIS, Caribbean OBIS, EurOBIS, OBIS-AU, OPI-OBIS, OBIS-UK.

3.3. OBIS2030

Mrs Martha Vides introduced this agenda item. The UN Ocean Decade recently endorsed our OBIS2030 project. The objective of OBIS2030 is

By 2030, OBIS will be the main biodiversity data hub made up of standardised, quality controlled and managed data to create information tailored for decision makers to help them protect and restore marine ecosystems and protect life in the ocean.

OBIS 2030

- accelerates the **generation or use of knowledge and understanding of the ocean**, with a specific focus on knowledge that will contribute to the achievement of the SDGs and complementary policy frameworks and initiatives
- is **co-designed** and/or co-delivered by knowledge generators and users, and thus facilitating the uptake of science and ocean knowledge for policy, decision-making, management and/or innovation
- ensures that all data and resulting knowledge are provided in an **open access**, shared, discoverable manner
- strengthens existing or creates **new partnerships** across nations and/or between diverse ocean actors, including users of ocean science.
- contributes toward **capacity development**, including, but not limited to, beneficiaries in SIDS, LDCs and LLDCs.

- overcomes barriers to **diversity and equity**, including gender, generational and geographic diversity.
- collaborates with and engages **local and indigenous** knowledge holders.

OBIS2030 aims to achieve this by:

1. improving the flow of historical and new data into OBIS, train the next generation of scientists and ocean professionals in biodiversity data management and contributing data to OBIS in a consistent manner, collaborate and bring together communities of practice (through clusters of decade actions) and organize or support capacity development and data mobilization activities;
2. creating and publishing information products, at global, regional and national scale to feed directly into reporting and assessment processes;
3. supporting and contributing quality-controlled data to initiatives in the development of a digital representation of the ocean (Digital Twin);
4. engaging and closely working together with stakeholders in the design and uptake of information products and assist with regional stakeholder meetings; and finally
5. developing specific targets, track their progress and generate regular progress reports, and implement a consistent communication and outreach strategy.

To help achieve the objective:

- OBIS2030 plans to identify geographic and taxonomic data gaps, allowing the identification of focal zones for data collection efforts. It also plans to evaluate the gaps in taxonomic coverage of current biodiversity information, identify indicator species and ecosystems, and strategies for species distribution modeling.
- OBIS2030 will also collaborate with international partnerships with current and future marine biodiversity observation initiatives (such as those under MarineLife2030, MBON and GOOS), access new big data technology, and enhance its capacity to deliver processed information and standardized products to support biodiversity assessments.
- OBIS2030 also plans to implement communication activities associated with each delivered information product, maintain an active social media presence, newsletter, and website, and create and maintain an internal communication network with nodes and direct collaborators to promote community engagement and support.
- Finally, OBIS2030 will support various communities that need actionable data and information products to support policy and management/decision-making at national, regional, and international scales, including industry, civil society, and the data/research community.

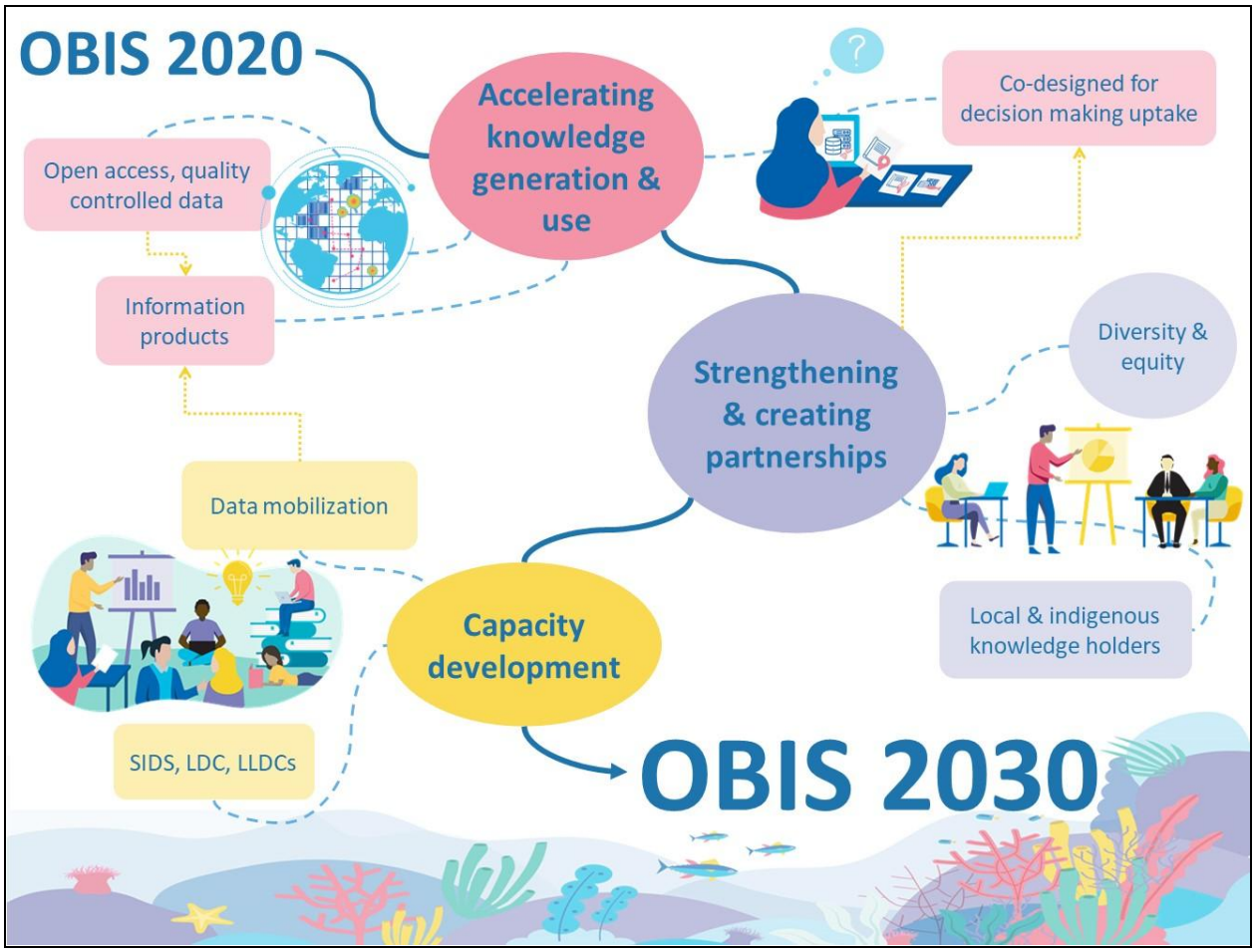


Figure: OBIS today and in 2030, the vision for OBIS 2030.

It should be noted however that achieving these objectives will require significant financial resources, as they involve a range of activities such as data collection, data management, capacity building, and communication and outreach efforts. Therefore, funding and investment will be crucial to ensure the success of OBIS2030 and its contributions to marine ecosystem management and protection. The drafting group identified that OBIS2030 needs 3 million US$ per year, of which 1 million US$ is already covered by existing OBIS secretariat and OBIS node resources, so an additional 2 million US$ per year is required to implement OBIS2030.
A more detailed work plan can be developed if a funding opportunity arises.

OBIS2030 is also an affiliated project of the MarineLife2030 Decade programme. ML2030 will hold quarterly meetings beginning in June 2023 and OBIS2030 will need to identify a representative to attend these meetings.

One of the aims of OBIS2030 is to provide a platform to (jointly) develop and share reliable biodiversity indicators and information products that describe changes in marine ecosystems.

To start with the implementation of OBIS2030, the **SG-OBIS decided** to establish an open-ended intersessional working group on OBIS-based marine biodiversity indicators and information products (IWG-OBIS-PRODUCTS).

The IWG-OBIS-Products should be a collaborative and interdisciplinary group that is driven by the importance of creating indicators and information products that are scientifically sound, practical, and relevant to decision-makers in government, industry, and civil society. The working group should make a significant contribution to advancing our understanding of marine biodiversity and ecosystem services, and help ensure the sustainable use and conservation of our oceans for generations to come.

The IWG-OBIS-Products will be open-ended, meaning it is open to participation by members outside of the SG-OBIS and should bring together a diverse group of experts and stakeholders.

The open-ended intersessional working group on OBIS-based marine biodiversity indicators and information products (IWG-OBIS-PRODUCTS) will have the following terms of reference.

- Reviewing existing OBIS information products
- Identify products needs (at local, regional or broader scales) in order to create a plan for future products implementation - this should be done by contacting nodes and stakeholders, including the community of users
- Perform a systematic analysis of the data in OBIS, identifying geographic and taxonomic gaps, which can help identify indicator species and ecosystems or strategies for species distribution modeling
- Contact ecological synthesis centers/groups to promote an exchange of knowledge and gather suggestions/advice on possible products that could be derived from OBIS
- Propose a process for frequent expert validation of information products by consulting with local scientific experts and end-users (including local communities and indigenous people)
- Discuss (1) the relevance of supporting community generated OBIS products and (2) if relevant, establish a potential framework for receiving and portraying those products.

The following members expressed interest to participate in IWG-OBIS-PRODUCTS: AntOBIS, OBIS-OPI, ISA-OBIS, OBIS Brazil, OBIS-AU, OBIS Japan, OTN-OBIS, IndOBIS, SEAOBIS, EurOBIS

4. OBIS work plan

The SG-OBIS agreed on the work plan for the next intersessional period with the action items listed below.

Action item	Responsible	Due date	Budget (*)
			(*) including in-kind contribution and source
OBIS Executive Committee			
Quarterly online meetings	OBIS co-chairs, with support from Sec	14 June 2023; 14 Sep 2023; 14 Dec 2023; 14 March 2024	0
Represent and report on OBIS at IODE management group and IODE committee meetings	OBIS co-chairs	Dec 23/Jan24	0
Report on activities to SG-OBIS	OBIS co-chairs	at least one month prior to the SG meeting	0
OBIS Secretariat			
Organize next SG-OBIS meeting	OBIS manager, with support from SG-OBIS co-chairs		14,000 USD
Regularly report and provide information or guidance on how OBIS nodes at local level can be more engaged and contribute to GOOS and MBON	OBIS manager		0
Establish cooperation agreement with LifeWatch ERIC, and organize online OBIS training course	OBIS manager		0
Plan and organize an in-person meeting with GBIF early 2024 to develop an action plan for adoption at the next SG-OBIS meeting	OBIS manager		TBD
Implement dataset keyword search and filtering	OBIS data manager	30/4/2024	DTO-BioFlow
Integration of and filtering on key WoRMS traits	OBIS data manager	30/4/2024	MPA Europe
Develop a bioinformatic pipeline for quality control and taxonomic annotation of sequence data	OBIS secretariat	31/12/2023	PacMAN, eDNA Expeditions, AtlantECO, and MARCO-BOLO
Reference implementation of quality control using WoRMS distributions and species distribution models	OBIS secretariat	30/4/2024	PacMAN, eDNA Expeditions, and MPA Europe
Set up online catalog for data products	OBIS data manager	31/7/2023	MPA Europe
Report on activities to SG-OBIS	OBIS secretariat	at least one month prior to the SG meeting	0
OBIS nodes			

All OBIS nodes to contact their IOC national delegations (see list at https://oceanexpert.org/document/17716) as soon as possible to ask them to make a case during the upcoming IOC Assembly to request more stable funding for OBIS operations and staffing and create a regular programme position for the OBIS data manager	OBIS node managers	Before 20 June 2023	0
Inactive OBIS nodes submit an action plan to become an active data publishing node again, within 3 months after the adoption of the report.	SEAOBIS, OBIS Indonesia and Fish OBIS	26 August 2023	0
Contact the WoRMS data management team at info@marinespecies.org in case no matching name in WoRMS can be found, ideally before publishing the dataset to OBIS	All OBIS nodes		0
Create GitHub accounts, and follow these OBIS GitHub repositories:. https://github.com/iobis/obis-network-datasets https://github.com/iobis/obis-issues https://github.com/iobis/manual	All OBIS nodes		0
Write a news article on the outcomes of the OBIS Historical Data Project Team (HDPT) in which OBIS can also invite the archeological community to publish historical data to OBIS	OPI-OBIS/MedOBIS		0
Inform and report on OBIS training activities	All OBIS nodes + Sec		0
Report on activities to SG-OBIS	OBIS node managers	at least one month prior to the SG meeting	0
OBIS Taxonomic Task Team			
Review non-matching names	EurOBIS/WoRMS All OBIS nodes	Continuous	In-kind EurOBIS/WoRMS
Report on activities to SG-OBIS	OBIS TaxTT chair	at least one month prior to the SG meeting	0
OBIS Capacity Development Task Team			
Implement the new CD strategy and propose an implementation plan following the suggestion of the IWG-OBIS-Structure.	OBIS EC	After the work of the IWG-OBIS-Structure	0
OTGA/OBIS Training course (Spanish). In-person (40 people).	OBIS Colombia	18-29 September 2023	in-kind
OTGA/OBIS online self-paced training course (English)Laksama	OBIS Secretariat	Sep-Dec 2023	20,000 USD from LifeWatch

Report on activities to SG-OBIS	OBIS CDTT chair	at least one month prior to the SG meeting	0
OBIS Vocab Infrastructure Project Team			
Develop and finalize training documentation regarding vocabulary selection	TBD	Continuous	
Elect a chair or co-chairs	TBD		
Report on activities to SG-OBIS	OBIS VIPT chair	at least one month prior to the SG meeting	0
OBIS Data Quality Project Team			
Align obis-qc with TDWG core tests and assertions and GBIF pipelines	All team members	Dec 2023	0
Report on activities to SG-OBIS	OBIS DQPT chair	at least one month prior to the SG meeting	0
OBIS Grand Unified Data Model Project Team			
Apply the data model to the selected datasets.	All team members	July 2023	0
Document issues, suggestions, and feasibility for each use case.	All team members	July 2023	0
Explore the feasibility of using frictionless data packages instead of Darwin Core Archives.	All team members	July 2023	0
Assess impact to OBIS data system including amount of work necessary, funding required, sources for funding if required, and recommendation on adoption.	All team members	September 2023	0
Report our findings to TDWG, GBIF Global Nodes and the GBIF data model project team.	OBIS GUMPT chair and team members	October 2023	0
Report on activities to SG-OBIS	OBIS GUMPT chair	at least one month prior to the SG meeting	0
IWG OBIS Data Policy			
Develop detailed data and metadata sharing guidelines that can be added as annex to the new IOC data policy.	All members	Before next SG meeting	Combine with IWG-OBIS-Structure meeting
Report on activities to SG-OBIS	IWG chair	at least one month prior to the SG meeting	0
IWG OBIS Management Structure			
Propose a new OBIS management structure and	All members	Before December	0

working methods to be in line with the new rules and procedures for IODE programme components		2023	
Reconsider the tasks of the OBIS Strategic Advisory Task Team (SATT) in the new OBIS management structure	All members		0
Online meetings	OBIS Sec	Before Nov 2023	0
In-person meeting	OBIS Sec	November 2023	11,000
Report on activities to SG-OBIS	IWG chair	at least one month prior to the SG meeting	0
IWG OBIS Communication and Outreach plan			
Develop OBIS outreach and communication plan in collaboration with communication experts (from OBIS nodes)	All members	After the IWG-OBIS-Structure	0
Report on activities to SG-OBIS	IWG chair	at least one month prior to the SG meeting	0
IWG OBIS DNA derived occurrence data			
Discuss and agree on changes and developments to the OBIS genetic data guidelines	All members	Continuous	0
Plan for a genetic data training package together with capacity development team	All members	TBD	0
Review genetic data formatting, and develop tools (e.g. in the robis package).	All members	TBD	0
Plan for activities based on the needs of the OBIS nodes with regards to genetic data	All members	TBD	0
Report on activities to SG-OBIS	IWG chair	at least one month prior to the SG meeting	0
IWG OBIS Products			
Identify products needs (local, regional, etc) that could drive a plan for future products implementation	All members	TBD	0
Reviewing existing OBIS information products (by contacting nodes)	All members	TBD	0
Contact ecological synthesis centers/groups to receive suggestions/advice of possible products that could be derived from OBIS	All members	TBD	0
Discuss a potential framework for adding community-generated products [or discuss if this would be a relevant approach]	All members	TBD	0

Report on activities to SG-OBIS	IWG chair	at least one month prior to the SG meeting	0

5. Election of new OBIS Co-Chair

Mr Ward Appeltans reported that a new co-chair had to be appointed. He reminded the SG-OBIS of the following terms which were proposed and adopted for the specific role of two co-chair positions to be elected by the SG-OBIS:

- The co-chairs of SG-OBIS provide specific, regular input and guidance to the OBIS Secretariat on the management, science and technology direction for OBIS within the context of the overall global biodiversity science community and should be knowledgeable representatives of that community.
- Co-chairs should expect to dedicate a minimum of 160 hours per year to their duties, including monthly video conferences, one or more representations at IODE management team and Committee meetings, major international conferences or special events on behalf of OBIS, and leadership duties in preparation and execution of annual SG-OBIS meetings.
- Co-chair positions are not funded by the IODE OBIS Project, and SG-OBIS members seeking nomination are encouraged to obtain full support from their home institutions to cover time and expenses of the role as part of core duties. Travel support may be provided by the IODE OBIS Project when available.

Practical Considerations:

- Co-chairs shall serve a term of 2-years, marked by the 2 annual SG-OBIS meetings following their election. Terms may be renewed up to one time by consensus of the SG-OBIS.
- Co-chairs shall be nominated and elected during the course of each annual SG-OBIS meeting with terms of the 2 co-chair positions staggered as to provide continuity.
- Nominations for co-chair shall be accepted from members of the SG-OBIS in good standing as either nomination on behalf of another or self-nominations.

Yi-Ming Gan nominated Katherine Tattersall to become the new OBIS Co-Chair.

Katherine Tattersall responded that she is glad to accept this nomination as a candidate to be Co-Chair of the IODE Steering Group for OBIS. She said: “I have been given strong support by my colleagues in the OBIS-AU Node and by my home agency, the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO). I am a research data manager at the Information and Data Centre at CSIRO, home of OBIS-AU. I have participated in OBIS Australia node activity since I joined the organisation in 2018 and have represented OBIS-AU at SG-OBIS meetings since 2019. I am the Data Steward for the CSIRO National Collections and

Marine Infrastructure (NCMI) Business Unit, entrusted with stewardship of research data across a group of over 450 people in the National Research Collections Australia (including the Australian National Fish Collection), The Atlas of Living Australia, the marine Engineering and Technology team, the Australian Marine National Facility and the Environomics Future Science Platform. Before joining CSIRO I was the Australian Research Data Cloud (ARDC) Research Data Specialist in Tasmania and oversaw data projects, promoted and supported good data management, facilitated national use of the ARDC vocabulary and DOI services and participated in a national data service registry project. Previously I worked for the Australian Integrated Marine Observing System (IMOS) and Australian Ocean Data Network (AODN). My early research interests had focused on the spatial analysis of biological marine science data, particularly animal tracking, spatial modelling and spatially explicit fisheries and ecosystems data. I am a sincere and responsible person and an excellent listener, and would bring my experience, lateral thinking and optimistic nature to the role of co-Chair of SG-OBIS. I would love to work with the OBIS Secretariat and the rest of SG-OBIS towards our common goals including the recently endorsed OBIS2030 project and to throw my effort behind the work plan agreed by the SG-OBIS.

The **SG-OBIS accepted** the nomination of Katherine Tattersall and **welcomed** her as the new OBIS Co-Chair.

6. Adoption of report

The **SG-OBIS adopted** the report with its decisions, recommendations, and work plan.

7. Date and place of next session

The **SG-OBIS requested** the OBIS Secretariat to organize a survey to propose the future mode of SG-OBIS meetings.

The 12th session of the SG-OBIS will take place on 11-15 March 2024 (date provisionally) in South Korea or Ostend (depending on the offer received).

The OBIS Secretariat suggested organizing the SG-OBIS-13 (2025) back-to-back with the IODE Committee meeting in March 2025 in Santa Marta, Colombia.

EurOBIS is suggesting to organize the SG-OBIS-14 (2026) back-to-back with the World Conference on Marine Biodiversity in November 2026 in Belgium.

8. Any other business

Mrs Yi-Ming Gan suggested establishing a procedure of reviewing requests from the community about adding/changing eMoF extension.

The **SG-OBIS requested** the OBIS Secretariat to propose a procedure for this.

Mrs Yi-Ming Gan suggested developing a communication about how GBIF publishers can publish marine datasets to OBIS.

The **SG-OBIS suggested** that this issue be raised in the preparation meetings with GBIF in preparing for the collaboration with GBIF.

9. Closing

The 11th session of the IODE Steering Group for OBIS concluded on 26 May 2023 at 16:30.

10. Annexes

Annex 1. Agenda/Time Table

CEST	**Tuesday 23rd May**	**Wednesday 24th May**	**Thursday 25th May**	**Friday 26th May**
2:00 PM	Opening Report of the Executive Committee	OBIS nodes *- Presentations (continued)* Collaborations and partnerships	OBIS Task Teams *- continued*	OBIS work plan
2:30 PM	Report of the OBIS Secretariat Projects contributing to OBIS	New Activities *-eDNA and OBIS* *-New OBIS structure* *-OBIS2030*	OBIS ad-hoc Project Teams	OBIS work plan (cont.)
3:00 PM	Projects contributing to OBIS *-continued*	New Activities *-continued*	OBIS ad-hoc Project Teams *- continued*	Election of Co-chair Adoption of report
3:30 PM	OBIS nodes *- Health check* *- Presentations*	OBIS Task Teams	OBIS work plan	Date and place of next session Any other business Closing

Annex 2. Decision Tree Vocabulary

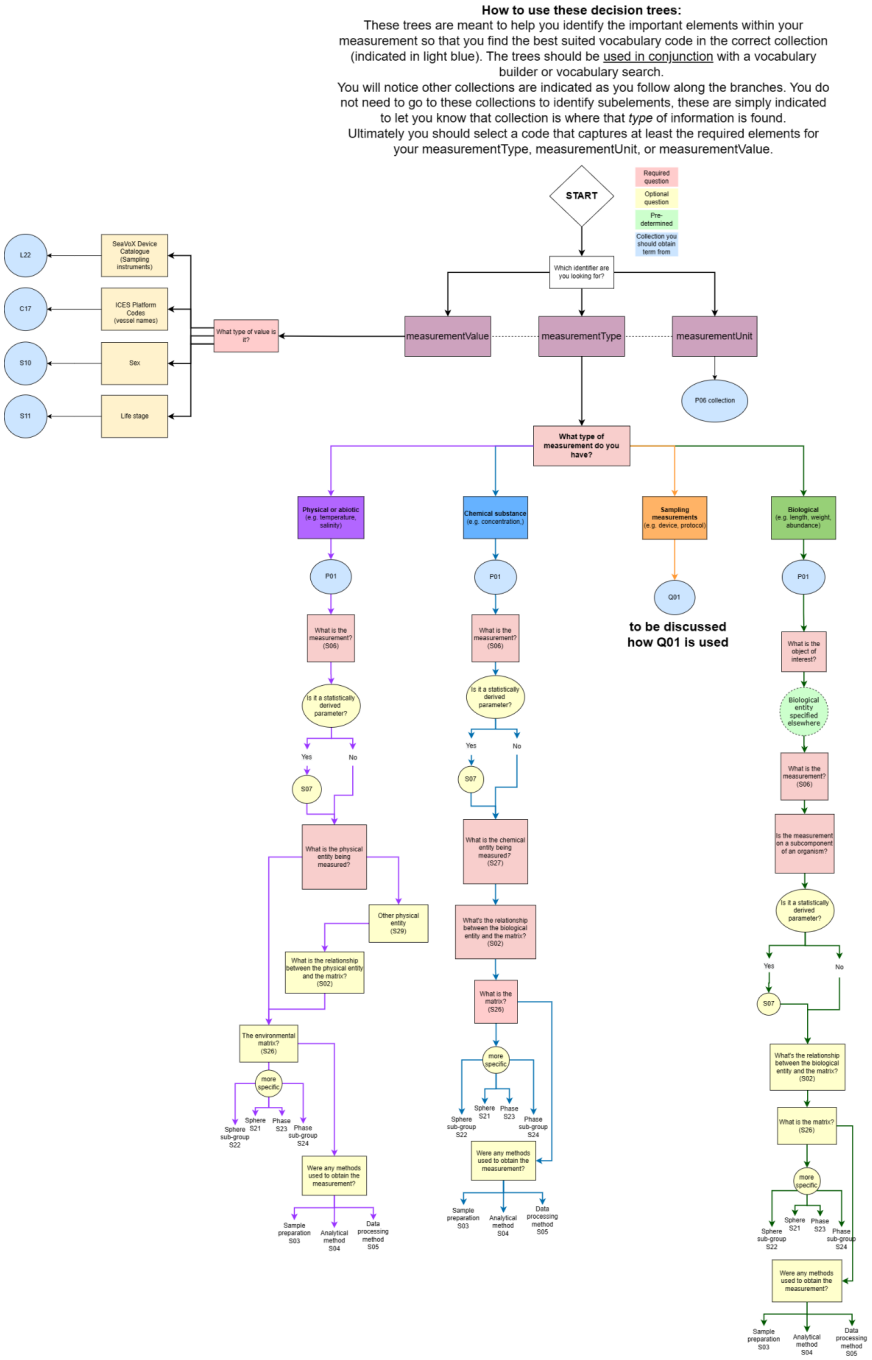


Figure. An up to date draft of the vocabulary guiding tree.

Annex 3. Proposed new OBIS Capacity Development strategy, focused on regional-level work.

Developed by Carolina Peralta

Building an effective relationship among nodes, around the shared vision of building a data provider and end-user community, can be addressed through capacity development networks, working together as peers, and decentralizing the organization of training activities. Training actions are common for all the nodes, being part of their normal relationship with the data providers, as they provide guidance in how the data should be formatted or what standards are important to follow or what and why some data need to be checked and corrected. Shared goals motivate actions and responsibility.

The vision is to see in the next 5 years a capacity development network for OBIS data management and stewardship, with nodes interacting through a defined workflow or schema in which questions about any data publication process can be addressed and treated by peers. The Capacity Development Task Team will provide the guidance and the support in training course material developed centrally (OBIS manual, videos, scripts, OTGA course), the training course environment and the main training action plan which will be fed back with the lessons learned from the capacity development network. Considering a regional approach will help to tackle language barriers, time zones issues, Diverse technical skills, etc.

For this I invite the nodes to read and make suggestions on the following proposal:

For discussion

Rationale: in order to support the commitment of the **OBIS Nodes** to serve data online and increase the institutional and professional data mobilization capacity, it may be necessary to share the engagement of data management literacy and training, by creating space for regional teams to take part on the capacity development tasks. Regional teams refer to more than one OBIS node that could work together for capacity development purposes.

For this, the recommendation is to set subgroups for the Capacity Development Task Team according to regions (e. g. Latin America and the Caribbean, Africa, Asia, etc.). This new approach would bring some nodes together and the space to help each other to engage better with data mobilization and training tasks, and for instance to work on each of the languages within the countries or regions. This could help to break any language barriers and can somehow make people feel closer and more comfortable to ask questions and move forward with the data mobilization in the specific region. This recommendation will also lead to a more inclusive approach where nodes from the same region can meet at a time zone that is suitable for them.

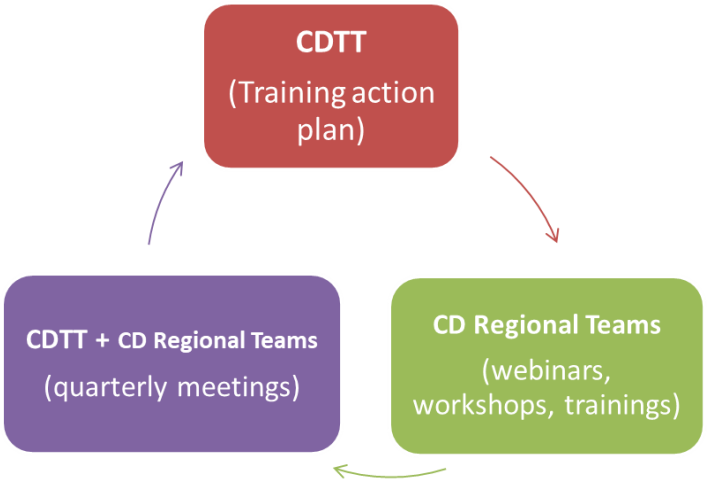
One of the actions in this context will be that **CD regional teams** would organize regional webinars, workshops or online meetings (e. g. North America, Asia, Europe, Africa, LATAM) to

follow up on their data management tasks and training needs (as an example we suggest taking a look at the Marine Biological data mobilization workshop organized by OBIS-USA and other organizations).

One of the main goals is by fostering a commitment from the Nodes trying to follow up and support their data managers and data providers, taking into account what needs to be prioritized (in each region) in terms of capacity for serving data to OBIS (funds, personnel, know-how?) and discuss strategies that could help to overcome those barriers.

To implement this new working approach, it is recommended to define regional teams (more than one node that decides to work together, organizing their regional meetings). The **CDTT** will coordinate quarterly follow up meetings, inviting all the **CD Regional teams** to discuss strategies for moving forward with serving data online. The result of those regional working meetings should be discussed in quarterly meetings together with the CDTT to review any support needed in data management processes within the OBIS context. One of the expected results of the regional meetings is to define training courses or any kind of training/literacy support to fulfill the needs. The aim is also to keep in line with other OBIS Project or Task Teams activities (e. g. QC Project Team, Taxonomy Task Team) to support the OBIS Capacity Building goals. The CD components include many aspects of data management, in terms of standards and formats required for publishing in OBIS. Many of these aspects are being carefully addressed by the Task Teams from which the CDTT gather the best practices and place them into the training strategies.

New proposed schema:



The quarterly meetings should collect information about the training progress and needs (e.g., surveys). The quarterly meetings should give feedback to the CDTT to evaluate the action plan implementation.

What to expect from this new approach? What do I want to make better? Why the need for a new schema? What do nodes gain from this new approach?

1) Have a better organization of the training needs within the OBIS team by sharing CD commitments/responsibilities/resources like, for example, identifying and serving capacity needs for the publishing process.

2) Reinforce a more connected work in terms of OBIS data management training needs.

3) The new regional schema allows to open more opportunities for the nodes to take part in capacity development actions and share CD commitments in a more interconnected working approach by minimizing certain barriers like language, time zones, technical issues (internet connection failures), job priorities, etc.

4) Sharing resources means less work and more streamlined practices between nodes. For instance, when a Spanish data publication guideline that is compliant to the data requirement of OBIS and GBIF is developed collectively and shared between different Spanish-speaking nodes, then data is expected to be published in a similar manner. This will ensure minimal updates needed in case of data not compliant to the quality requirements. This also means that the same resource can be reused by different nodes and less effort needed to develop resources for the local community.

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