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Changes in IODE structure and Terms of Reference

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ISSUES TO BE DISCUSSED

The Committee will be invited to consider the weaknesses of the current IODE terms of reference and structure. It will be invited to consider proposals for the revision of the IODE terms of reference and for the establishment of "IODE Specialized Ocean Data Centres (IODE-SODC)". The proposals made in this Document will be discussed by the sessional working group established under agenda item 8.1.

DECISIONS/ACTIONS REQUIRED FROM THE COMMITTEE

The Committee is requested to:

1. consider the recommendation to revise the Terms of Reference of IODE
2. consider the recommendation for the establishment of IODE-SODCs

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APPENDIX: DRAFT TEXT FOR INCLUSION IN THE SUMMARY REPORT OF IODE-XXII

"This Agenda Item was introduced by the Co-Chairs. They recalled the discussions on organizational reform during IODE-XXI including follow-up to the IODE review (2007), IODE arrangements for the long-tem secure archival of data and information, the future of RNODCs and SOCs, IODE data and information centres quality management and certification, and implementation of the IOC strategic plan for oceanographic data and information exchange. They then referred to Document IOC/IODE-XXII/21 entitled "Changes in IODE Structure and Terms of Reference". They noted that the Document identified 3 important weaknesses of IODE today: (i) IODE is too closely knit and somewhat exclusive (limited to NODCs); (ii) there is little involvement of the ocean research and observation community; and (iii) users of IODE services/products are not well defined. They called the attention of the Committee to two proposals formulated in the document and invited the Committee to discuss these during the meeting of the sessional working group on strategy established under Agenda Item 8.1.

The Committee adopted *Recommendation(s) IODE-XX/8.3.x,…"*

ANNEX: DISCUSSION DOCUMENT

1. Introduction

This document will furthermore give an overview of the current objectives, structure and stakeholders of IODE.

It will also identify the weaknesses of the current structure. It will propose a review of the objectives and structure of IODE in order to face the challenges of the future. It will propose the establishment of "IODE Specialized Ocean Data Centres (IODE-SODC)".

2. IODE Objectives

The objectives of the IODE Programme have remained fairly constant over the past 50 years, except for one revision during IODE-XVIII (2005) and IODE-XXI (2011). They are:

1. to facilitate and promote the exchange of all marine data and information including metadata, products and information in real-time, near real time and delayed mode, in compliance with the IOC Oceanographic Data Exchange Policy;

2. to ensure the long term archival, management and services of all marine data and information;

3. to promote the use of international standards, and develop or help in the development of standards and methods for the global exchange of marine data and information, using the most appropriate information management and information technology;

4. to assist Member States to acquire the necessary capacity to manage marine data and information and become partners in the IODE network; and

5. to support international scientific and operational marine programmes of IOC and WMO and their sponsor organisations with advice and data management services.

The simple structure based upon NODCs and DNAs (one per country) enabled a fairly simple data stream from research to NODC to WDC (the latter being part of ICSU). The WDCs were established as long-term secure data archives. As there (initially) three the system had an inbuilt redundancy in case a global conflict or natural disaster would destroy one or more of the WDCs.

These objectives are still valid today. However what is missing in the Terms of Reference is a reference to stakeholders. Who are the stakeholders in IODE? Traditionally IODE has focused its activities on the National Oceanographic Data Centres (NODCs) and Designated National Agencies (DNAs). These have been the main but to a large extent, also only direct stakeholders in IODE for over 50 years. This has created a strong a loyal community of experts.

The pool of expertise available in the 80 NODCs and DNAs has been used also for the development of the many IODE projects, both global and regional. Also for the management of these projects IODE used the same pool of expertise. The management of IODE and its activities has thus always been democratic and inclusive.

This network has also assured the transfer of expertise from generation to generation within and between the NODCs and DNAs as well as between developed and developing nations to ensure equitable participation of all IOC Member States in IOC activities. This

has also led to the development of the OceanTeacher project and OceanTeacher Academy to further strengthen intra-programme education and training.

An overview of the IODE structural elements and their interactions is shown in Figure 1.

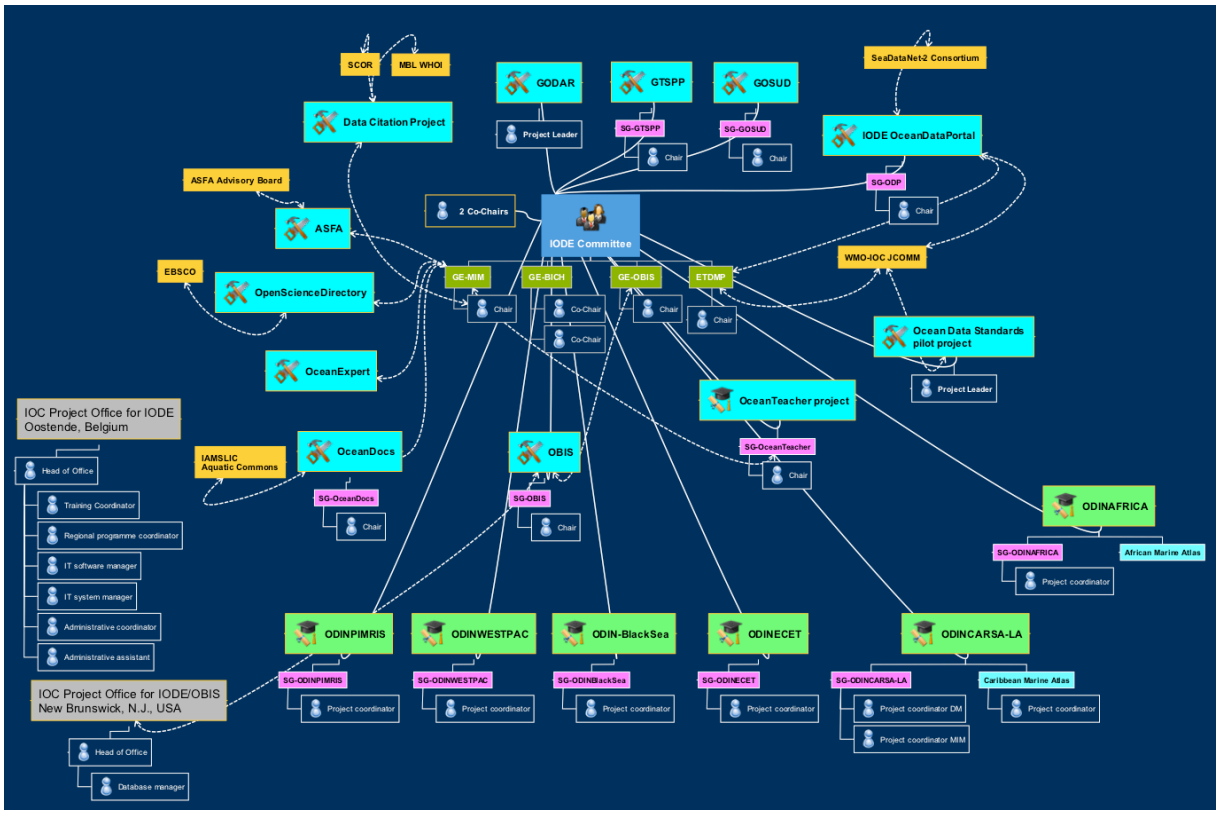

Figure 1: IODE structural elements and their relationships

During the first two decades of IODE the simple structure of NODCs, DNAs, RNODCs and, through ICSU, WDCs worked well as data management was a technology-intensive activity involving heavy investment in, at that time, very expensive data processing technology (mainframe and mini computers). This changed dramatically in the 1980s with the birth of the Personal Computer and with the development of the Internet and World Wide Web in the 1990s. These two development have changed the way everyone manages and accesses data and information. Computing power and the ability to make data and information is no longer limited to specialized institutions. These abilities are now given to everyone.

Today the research community can collect data automatically (on-board, platform based), process, store and serve data without the intervention of specialized data centres like NODCs. For historical reasons certain research facilities still make use of the NODCs but many others do not. At best they transfer their data to the NODCs for storage and serving.

A first question we have to ask therefore is: ***does the ocean research community (still) need IODE?***

3. Uniqueness of IODE

When IODE was established in 1961 it was unique programme at the global scale. It was the only programme that dealt only with ocean data management at the global scale. The ICSU WDS system complemented IODE as it was responsible for the long-term secure archival of data. In 1961 there were very few regional organizations that dealt with oceanography and data management. There was ICES as a regional organization but this did not exclusively deal with data management. If we fast forward to today then the situation is very different. Especially Europe, through the European Union and European Commission, had made tremendous progress. It spends (m)(b)illions of Euros on marine research and associated data management. In the past decade it has supported the development of SeaDataNet and is now embarking on the development of the European Marine Observation and Data Network which is part of the massive Marine Knowledge 2020 initiative. Marine Knowledge 2020 (http://ec.europa.eu/maritimeaffairs/policy/marine_knowledge_2020/index_en.htm) brings together marine data from different sources with the aim of: (i) Helping industry, public authorities and researchers find the data and make more effective use of them to develop new products and services; and (ii) Improving our understanding of how the seas behave. Through the prototype websites of the European Marine Observation and Data Network (EMODNET), engineers and scientists can see what data are available for a given sea basin, and download both original observations and derived data products such as digital terrain models, sediment distributions and marine habitats. These programmes create clear links between research, data management and users.

Also at the national level several countries are building integrated data systems that include data portals. We also see that some of the national and regional initiatives are establishing their own bilateral or multilateral linkages, independently of IODE.

So we now have a world where there are many small to large groups dealing with the same issues as IODE. Many of these are project based and poorly funded, others are large initiatives extremely well funded. Interaction between these many initiatives is still rather poor. ***Similarly interoperability and harmonization between these many initiatives is not well coordinated. IODE is no longer the only player but it is the poorest player.***

4. Stakeholders

As mentioned above traditionally IODE has focused its activities on the National Oceanographic Data Centres (NODCs) and Designated National Agencies (DNAs). This worked fine in the early days when there was a dependency on centralized expensive data processing equipment. Researchers had little choice but to pass their data to the NODCs. This situation is now totally different.

By still focusing only on the NODCs and DNAs, IODE is limiting its stakeholder community to 80 centres and their Directors involved in data management (the IODE national coordinators working in the NODCs). At the same time there are many communities of ocean researchers numbering tens of thousands who are developing their own data systems and serving these to their own user communities.

If we look at IODE's Marine Information Management the failure to connect with the relevant communities is just as obvious: the IODE has 50 national coordinators for Marine Information Management. The International Association for Aquatic and Marine Science Libraries and Information Center (IAMSLIC) has a membership of over 300.

The disconnect between our IODE structures and the ocean research community is increasingly impacting on the work of IODE as a programme. While IODE tries to adopt data management standards, many research projects design their own best practices. This has become very clear in the JCOMM/IODE Ocean Data Standards pilot project which has been able to publish just 2 standards in 4 years. Simply put, nobody is waiting for JCOMM/IODE's standards.

Unless IODE re-defines its stakeholders and provides products and services needed by these stakeholders there will be no need for IODE.

5. Capacity building

IODE has had a long tradition of mutual support: assisting each other by sharing expertise and knowledge. This was an obvious requirement as there existed (and still does not exist) no formal training for ocean data management. Within IOC the IODE programme has had the longest tradition in training as well as more extensive capacity development. IODE launched the ODIN principle in the late 1980s, which combined the provision of equipment, training and operational (financial) support in a regional context and over a long period of time. The ODIN concept was demonstrated successfully in Africa. The success was made possible thanks to the long-term financial support by a donor. Attempts to replicate the success in other regions but without the same level of financial support were not as successful and have either been fading away or did not take off at all. Exceptions were the development of regional e-repositories developed by the marine librarian community.

Complementing the ODIN projects we saw the development of OceanTeacher. As said above there is no formal education for ocean data managers and even librarians need specialized training to become specialized (marine)librarians. As such, in the late 1990s, IODE embarked on the development of OceanTeacher (http://www.oceanteacher.org). Again thanks to donor support OceanTeacher was able to develop strongly into an international training programme + online training resource. In terms of training this went together with the establishment of the IOC Project Office for IODE in 2005, supported by the Government of Flanders, which became the main training site for IODE. Between April 2005 and today over 1200 students from 110 countries have been trained. Every year about 8 courses are organized. The funding also enabled to hire two staff dedicated to OceanTeacher: a training coordinator and 2 IT professionals.

OceanTeacher has focused not only on training NODCs staff but also on young researchers: when talking to young researchers it became apparent very quickly that during their university education they were almost never introduced to data management. OceanTeacher therefore designed a special introductory course for this community, in collaboration with a University. This course is now also taught within a POGO curriculum. This experience demonstrates again the need to expand the IODE stakeholder community.

IODE has built an excellent reputation in capacity building when properly resourced: from organizing training courses to building regional data and information networks.

6. Strengths and weaknesses

The previous chapters paint a bleak picture for IODE. From being a leader in data management at the global level we appear to have shrunken to a small group of less than 100 professionals focusing only on our own needs, and thereby becoming marginalized.

So the question we must address is: *Is there a future for IODE and if so, what will be that future?*

So what are, today, IODE's strengths and weaknesses?

IODE Strengths	**IODE weaknesses**
- supportive and well organized international groups of data and information management experts - high level of expertise in many of the NODCs - excellent training experience	- too closely knit and somewhat exclusive (often limited to NODCs) - too little involvement of ocean research and observation community - users of IODE services/products not well defined - many NODCs have small staff number and volatile staff movements can seriously affect the functions of the NODC - number of students/course is small so audience reached is small - language: mostly English only (at international IODE level) - IODE programme poorly funded/resourced and too dependent on single donor

Table 1: IODE strengths and weaknesses

7. The way forward

There are factors over which we have some control but any others that we as a community cannot control. The IOC Member States and their decision makers also have factors that they can and cannot control.

Controllable by us (IODE community)	**Not easily controllable by us (IODE community)**
- identifying and improving links with stakeholders - properly documenting and making available data management	- funding to NODC by national government - funding/resourcing to IODE by

procedures - building (a) functional portal(s) to make available the data available in NODCs and promoting these - building good e-repositories, directories of experts and promoting these - developing and managing training programme for all stakeholders	UNESCO - funding/resourcing from donors

Table 2: factors affecting IODE that we can or cannot control

So what is the way forward?

A first question is *whether the IODE national coordinators and NODCs are still interested in the future of IODE??*

Can IODE continue to operate – as is- and within the current funding allocation provided by UNESCO? The answer is NO. While we cannot influence the funding we received from UNESCO's regular programme budget we can influence donor funding by what we produce. If it is perceived that IODE activities are no longer relevant to regional or global ocean science and observation then donor funding will further shrink and disappear.

8. Proposals

8.1. Proposal 1: Revision of the IODE Terms of Reference

As said previously what is missing in the Terms of Reference is a reference to stakeholders. It is proposed to expand the IODE stakeholders to include the ocean research and observation community and thus to revise the Terms of Reference as follows (changes in red):

1. To facilitate and promote the exchange of, and access to, marine data and information including metadata, products and information in real-time, near real time and delayed mode, in compliance with the IOC Oceanographic Data Exchange Policy for the ocean research and observation community and other stakeholders

2. To ensure the long term archival, documentation, management and services of all marine data, data products, and information;

3. To promote the use of international standards, and develop or help in the development of standards and methods for the global exchange of marine data and information, using the most appropriate information management and information technology;

4. To assist Member States to acquire the necessary capacity to manage marine research and observation data and information and become partners in the IODE network; and

5. To support international scientific and operational marine programmes of IOC and WMO and their sponsor organizations with advice and data management services.

8.2. Proposal 2: The IODE Specialized Ocean Data Centre (IODE-SODC)

The main weakness of IODE today is the lack of involvement of the ocean research and observation community and its too closely knit and somewhat exclusive structure (limited to NODCs).

In some Member States an excellent relation has been built between NODCs and national research institutions. In other cases such a relationship has not been built and this for a variety of reasons. In the latter case this means that data may not be deposited at the NODC and awareness of the research community about data management and IODE may be very low.

However in those cases where a good relationship exists there may be a wide variety of projects, programmes and institutions that operate at the national or regional level and that collect data. These entities may have set up their own data management system or worse, they may have no formal data management system.. When they did set up a data management system they may or may not have used IODE methods (e.g. for quality control). In addition the existing NODCs may not have the resources to process all data generated they these other entities.

The proposal is therefore to establish a new type of data centre: a "**IODE Specialized Ocean Data Centres (IODE-SODC)**". These centres will operate independently of IODE but will be associated with IODE. This means the following:

- they can be a group of individuals, a national/regional/international project, programme or institution;
- they will have access to IODE documentation and expertise in the area of oceanographic data management and marine information management;
- they will be part of the IODE information dissemination network related to oceanographic data management and marine information management;
- they will be able to obtain IODE (OceanTeacher) technical training related to oceanographic data management and marine information management;
- they will be invited to make their data and information available through relevant IODE mechanisms (e.g. OceanDataPortal, OceanDocs, OceanExpert, OBIS,…)
- they will be invited to participate in IODE projects;
- they will be invited to designate experts to participate in IODE project steering groups or IODE groups of experts (short-term members).

The **purpose** of the IODE Specialized Ocean Data Centres (IODE-SODC) will be to:

- expand the stakeholder community of IODE to include the ocean research and observation community;
- better respond to data and information management needs of the ocean research and observation community;
- improve coverage and access to oceanographic data and information.

- To increase interaction and alignment of relevant services with national and international observation and research programs

8.2.1. Application to establish a IODE Specialized Ocean Data Centre (IODE-SODC)

Any national, regional or international project, programme, institution or organization can apply to become an IODE Specialized Ocean Data Centre (IODE-SODC).

Minimum information to include in the application is as follows:

- a comprehensive description of the candidate project/programme/instiutution and its expected data output,
- data management plan (if existing), including identified formats, quality control procedures, …
- staff (e.g. principal investigator, person(s) responsible for data/information management);
- stakeholders (e.g. number of scientists involved)
- required expertise, training that IODE could contribute;
- data policy (if identified) that describes if/how data will be made available (e.g. freely, licensed, creative commons license, following national policy,…);
- existing relationship with a NODC.

The application should be submitted by email to the IODE Secretariat requesting the establishment of the IODE-SODC for x whereby x indicates the identity of the SODC (e.g. MARIUS project, …)

8.2.2. Decision on applications

Applications received by the IODE Secretariat will be considered by the IODE Officers. They will be requested to review the application, taking into account the purpose of SODCs as well as expected contribution of the SODC to IODE.

8.3. Proposal 3: JCOMM/IODE Global Data Assembly Centre (GDAC) for the JCOMM Marine Climate Data System (MCDS)

Reference is made to Document IOC/IODE-XXII/23 (The JCOMM Marine Climate Data System) where it is noted that a number of IODE projects such as GTSPP, WOD, GOSUD etc could establish Global Data Assembly Centres (GDACs) while NODCs, ODIN regional data centres, GOOS GRA data centres and the proposed IODE SODCs (Specialized Ocean Data Centres) could operate at the same level of the marine meteorology DACs (Data Acquisition Centres).

[end]