**Intergovernmental Oceanographic Commission**
*Reports of Governing and Major Subsidiary Bodies*

# IOC Committee on International Oceanographic Data and Information Exchange

## Twenty-first Session

Liège, Belgium
23–26 March 2011

**UNESCO**

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**UNESCO 2011**

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**Abstract**

The IOC Committee on International Oceanographic Data and Information Exchange held its Twenty-first Session (IODE-XXI) at the Palais des Congrès, Liège, Belgium between 23 and 26 March 2011. The Session was attended by 74 participants from 36 IOC Member States and seven organizations. The Session's outcomes included: (i) the further steps towards the adoption of OBIS by IODE, including the recommended establishment of an IOC Project Office for IODE/OBIS; (ii) the continuation of the IOC Project Office for IODE in Ostend, Belgium; (iii) a Statement on the IODE role in the ICSU World Data System; (iv) the planned further expansion of OceanTeacher to include a wider range of IOC disciplines as well as the recommended development of a five-year training plan; (v) the planned revision of the IOC Strategic Plan for Oceanographic Data and Information Exchange (2012–2015). The Committee elected Ms Sissy Iona (Greece) and Mr Ariel Troisi (Argentina) as IODE Co-Chairs.

* An executive Summary of this report is available as IOC/IODE-XXI/3s in English, French, Russian and Spanish.


**Figure 1: Venue IODE-XXI, Liège, Belgium**

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**ANNEXES**

## 1. OPENING

*1* Mr Greg Reed, Co-Chair of the IOC Committee on International Oceanographic Data and Information Exchange (IODE) welcomed the participants to the twenty-first Session of the IODE Committee at 09h00 on Wednesday 23 March 2011 at the Conference Centre of Liège, Belgium. The Meeting was informed that Dr Malika Bel-Hassen Abid, Co-Chair would attend as from the second day.

*2* The Meeting was then addressed by Mr Serge Scory representing the host country. The Meeting observed one minute of silence to remember the victims of the 11 March, 2011 earthquake and tsunami in Japan.

*3* Dr Dominique Fonteyn, Director General, Directorate General Research and Applications, Belgian Federal Science Policy Office, then addressed the Committee and welcomed the delegates on behalf of the Belgian government. His welcoming address is attached as Annex IV.

## 2. ADMINISTRATIVE ARRANGEMENTS

### 2.1 ADOPTION OF THE AGENDA

*4* The Technical Secretary, Mr Peter Pissierssens, introduced this Agenda Item. The Committee was invited to review and adopt the provisional agenda (Document IOC/IODE-XXI/1 prov.), available from the IODE web site http://www.iode.org/iode21. The Committee was requested to note that working documents were now only available from the web site.

*5* **The Committee adopted** the Agenda as attached in Annex I.

### 2.2 DESIGNATION OF A RAPPORTEUR

*6* **The Committee**, taking into account the limited size of most delegations **decided not to nominate a Rapporteur**, and **tasked** the Secretariat and Co-Chairs with the reporting of the Meeting.

### 2.3 SESSION TIME TABLE AND DOCUMENTATION

*7* **The Committee adopted** the Timetable (Document IOC/IODE-XXI/1 Add. Prov.).

*8* The IODE Technical Secretary reviewed the arrangements for the Session and presented Document IOC/IODE-XXI/4 prov. (*List of Documents*) available on line through http://www.iode.org/iode21 and attached as Annex V.

*9* He informed the Committee about the working hours for the Session and other details relevant to the conduct of the Session. He reminded the Committee that this Session had only three working days to deal with the substance of the meeting as compared with four during the previous Session. Accordingly there would be no time for extensive introductions of agenda items and participants were urged to carefully read the Action Paper and working documents in preparation for the Session.

### 2.4 ESTABLISHMENT OF SESSIONAL WORKING GROUPS

*10* The Technical Secretary invited the Committee to establish sessional working groups. **The Committee established** the following sessional working groups:

*11* (i) Sessional working group on work plan and budget: This sessional working group was tasked with preparing a work plan and budget for the remainder of 2011 and for the period 2012–2013. The group was requested to bear in mind that that funds remaining for 2011 from the UNESCO RP amounted to only US$ 80,000 (including OBIS). The sessional working group was requested to work on the basis of a possible budget for 2012–2013 of US$ 195,500 (excluding OBIS) and approx. US$ 90,000 (for OBIS) from the UNESCO Regular Programme under "HLO 3–3c Capacity-development necessary for maintenance of healthy ocean ecosystems focusing on the regional needs". The sessional working group was further requested to summarise the financial requests of the IODE Groups of Experts as well as those of projects and project proposals, and to propose prioritization of the requests.

*12* (ii) Sessional working group on capacity building requirements: This sessional working group was tasked with reviewing the development and implementation of the respective ODINs, recommend mechanisms for strengthening them and developing work plans for the next inter-sessional period.

*13* (iii) Sessional working group on ODINWESTPAC: This sessional working group was tasked with reviewing the progress with implementation of ODINWESTPAC and to recommend mechanisms for strengthening the network as well as developing work plans for the next inter-sessional period.

*14* (iv) Sessional working group on the role of IODE in the World Data System: this sessional working group was tasked to prepare a draft statement to ICSU regarding the role of IODE in the World Data System.

### 2.5 LOCAL ARRANGEMENTS

*15* Mr Scory informed the Committee on local arrangements. Information and guidelines for participants were made available through the web site http://www.iode2011.be.

## 3. INTRODUCTORY REPORTS

*16* Under this agenda item reports were presented that provided an overall overview of the IODE system, its activities and implementation of the programme at the national, regional and global levels.

### 3.1 CO-CHAIR'S REPORT

*17* Mr Greg Reed, Co-Chair presented his report on inter-sessional activities. He reported that the IODE Groups of Experts continued to develop and improve IODE's data and information management capabilities.

*18* The IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GE-BICH) made substantial progress with its workplan for the period 2009–2011, including the development of a GE-BICH wiki. GE-BICH met for its fifth session in January 2011.

*19* The IODE Group of Experts on Marine Information Management (GE-MIM) completed its Communication Strategy, which promotes exchange of factual and intellectual information among IOC stakeholders, continues to maintain the IODE OceanDocs Repository and supports the Aquatic Commons repository. GE-MIM produced the IODE 50th Anniversary Bibliography which is an important and useful contribution to demonstrate the substantial progress achieved by the IODE. The GE-MIM Chair has also served on the IODE 50th Anniversary Planning Committee.

*20* The integration of OBIS into the IODE community continues and the committee, during this session, will be requested to recommend the establishment of the GE-OBIS, the SG-OBIS, and the IOC Project Office for IODE/OBIS.

*21* Co-operation between IODE and JCOMM has continued to strengthen during the inter-sessional period. The second session of the JCOMM/IODE Expert Team on Data Management Practices (ETDMP), which was held in April 2010, established three separate task teams: (i) Ocean Data Standards (ODS); (ii) metadata; and (iii) OceanDataPortal (ODP). The Ocean Data Standards project has progressed slowly over the inter-sessional period. Two recommended standards have been published and another two other submissions are in the process of review.

*22* IODE has also been a partner with JCOMM in the Pilot Project for the integration of marine meteorological and other appropriate oceanographic observations into the WMO Integrated Global Observing Systems (WIGOS) – also known as the JCOMM Pilot Project for WIGOS. This project concluded in December 2010 after a period of two years and has made an important contribution to the test of concept phase of WIGOS. Through WIGOS, the NODCs will be able to contribute oceanographic data, both in real-time and delayed mode, through interoperability arrangements between the WMO Information System (WIS) and the IODE Ocean Data Portal.

*23* The development of the IODE Ocean Data Portal (ODP) continued with new versions of the ODP software components released during the inter-sessional period. Additional data providers have been registered and currently there are more than 1,000,000 datasets available through ODP. Work has begun on Version 2 of ODP which will be fully compliant with international interoperability standards and tools.

*24* OceanTeacher continued to provide the foundation of the IODE capacity building programme by providing training tools for data and information management. The OceanTeacher Academy (OTA), which offers a programme of courses related to oceanographic data and information management and the development of related products and services, commenced its first academic year in 2009. OTA also promotes the development of regional training nodes, which will contribute to the long-term sustained provision of capacity building activities for IODE and other IOC programmes. IODE's regional capacity building projects have advanced during the inter-sessional period. The fourth phase of ODINAFRICA continued and work plans for the other ODINs would be proposed during the session. The development of marine atlas projects for Africa and the Caribbean has progressed well. IODE is a member of the International Coastal Atlas Network (ICAN) and will host the 5th Session of ICAN in 2011 as well as hosting CoastGIS 2011.

*25* The transition from the ICSU World Data Centre system to the new World Data System (WDS) will create an opportunity for IODE to collaborate with ICSU to become part of the new system. Affiliation of IODE as a community in the new WDS structure will be further discussed during the session.

*26* The collaboration between SCOR and IODE continues on data publishing. Two pilot projects are underway to promote data publication and to provide a data publication and a link to data in publications.

*27* Mr Reed concluded by stating that this Session of the IODE Committee marks the 50th anniversary of our programme – an important milestone. As part of the 50$^{th}$ anniversary celebrations a scientific conference, which proceeded this session, examined the achievements of the IODE, including the data and information products and services that are delivered by the NODCs, and discussed emerging technologies and future plans for the Programme.

## 3.2 IMPLEMENTATION STATUS OF THE IODE-XX WORK PLAN

*28* This Agenda item was introduced by the Technical Secretary, referring to Document IOC/IODE-XXI/7 (*Implementation Status of the IODE-XX Work Plan*) and Document IOC/INF-1272 (*2010 Officers Meeting: Summary Report*)**.** He recalled that the IODE-XX Action Sheet was reviewed during the IODE Officers Meeting that took place at the IOC Project Office for IODE between 8 and 11 March 2010. The Officers had made a comprehensive review of the status of the implementation of the action plan at that time and had recommended remedial actions for incomplete action items. Mr Pissierssens reported that nearly all action items of the work plan had been implemented and that, in response to emerging issues a number of new action items had been implemented as well.

*29* **The Committee congratulated** the Officers and the IODE Secretariat for the hard work in ensuring a high level of implementation of the IODE-XX workplan.

## 3.3 FINANCIAL AND IN-KIND CONTRIBUTION REPORT

*30* This agenda item was introduced by the Technical Secretary. He reported that IODE had received US$ 195,900 (including US$ 10,000 for OBIS) from the UNESCO Regular programme for the biennium 2010–2011 and continued to receive substantial extra-budgetary funding during the inter-sessional period 2009–2011. However he noted that, again, most of the extra-budgetary funding was received from a single Member State (Government of Flanders, Belgium) either through the UNESCO/Flanders Fund-in-Trust for the support of UNESCO's activities in the field of Science (FUST) or through the IOC Project Office for IODE (Ostend, Belgium). Additional support was received (as was the case in the previous inter-sessional period) from the European Commission through IODE's participation in the CASPINFO and UBSS projects. Unfortunately it had not been possible to resolve the administrative issues between UNESCO and the European Commission and this had resulted in the termination of funding for IODE from the SeaDataNet project. Cooperation with WMO through JCOMM had continued and was further expanded thereby enabling the pooling of financial and human resources for the further development of JCOMM and IODE/JCOMM activities (see also Agenda Items 6 and 9.2). The adoption of OBIS by IODE had resulted in additional financial support from several Member States, earmarked for OBIS. This was further covered under Agenda Item 5.

*31* Mr Pissierssens reported that for the next inter-sessional period the level of extra-budgetary support contributed by Flanders would be largely maintained: the currently ongoing large-scale projects (ODINAFRICA, OceanTeacher Academy, Caribbean Marine Atlas) would continue until December 2013. The Technical Secretary also noted that two professional positions (IT developer and Regional Activities coordinator) were currently being funded through FUST activities and this will also continue until December 2013. The Technical Secretary informed the Committee on the decision by the Government of Flanders to continue support of the Ostend Office (see also Agenda Item 4.2.1).

*32* The Government of Flanders had indicated that no additional phase of ODINAFRICA would be supported. The CASPINFO project ended at the beginning of 2011 and the UBSS project would end in April 2011. IODE was invited to collaborate in the SeaDataNet-2 project as a sub-contractor. At the time of this session, no information was available on the status of approval of the SeaDataNet-2 proposal which was submitted to the European Commission.

*33* Additional information of confirmed and expected financial allocations for IODE is provided under Agenda Item 13.

*34* The Technical Secretary expressed concern about the limited number of donors contributing to IODE. It was noted that many Governments are going through a period of

austerity and budget cuts following the recent financial crisis. This can be expected to have a negative impact on supporting international organizations and their activities, including IODE. This period of austerity may well continue throughout the next inter-sessional period 2011–2013. IODE will therefore, more than ever, need to prioritize its activities to core objectives that have a long-term impact.

*35* The Technical Secretary recalled that IOC Member States, through the IODE national coordinators, were invited to second staff to the IOC Project Office for IODE. It was reported that no secondments were offered between 2009 and 2011.

*36* The delegate of China, Prof. Lin Shaohua informed the Committee that China is considering seconding one or two experts to the IODE Project Office between 2011 and 2013.

*37* **The Committee thanked** China for this kind offer and **instructed** the Secretariat to discuss the administrative arrangements with China.

*38* **The Committee expressed its great appreciation** to the Government of Flanders (Belgium) for the support it has continued to provide for the implementation of IODE activities.

### 3.4 INTRODUCTION TO WORK PLAN AND BUDGET

*39* This Agenda Item was introduced by Mr Greg Reed, IODE Co-Chair. He provided a brief presentation outlining the budget requests that have been included in the working documents. He noted that the sessional working group on work plan and budget would further discuss this topic in preparation for Agenda Item 13.

## 4. NODC AND PROJECT OFFICE REPORTS

### 4.1 REPORTS OF NODCS, DNAS AND MARINE INFORMATION CENTRES

*40* This Agenda item was introduced by Mr Robert Gelfeld, Consultant, referring to Document IOC/IODE-XXI/9 (*Report on activities of the NODCs and DNAs*). The Secretariat had revised the national report format to encompass an online survey (one for Data Management and one for Marine Information Management) as prepared for IODE-XX and modified slightly to reflect changes during the inter-sessional period 2009–2010. These surveys allowed the Secretariat to obtain more quantitative information that enabled it to identify trends at the national level, as well as capacity building and general IODE programme needs.

*41* Mr Gelfeld reported that sixty National Reports were received for Data Management and thirty-three reports for Marine Information Management. This represented a slight decrease from reports submitted for IODE-XX and continues a low trend of response for the online surveys. Member States were encouraged to reflect on why there continued to be a limited response to the online surveys from the overall IODE community.

*42* The majority of Member States reported that they have an IODE National Oceanographic Data Centre (NODC) and these are evenly split between being a centralized (single) and distributed (multiple) centre. An overwhelming number now provided their services online and the majority of Member States have a metadata catalogue. Most receive data from government and academic agencies and a smaller proportion also receive data from privately funded research institutions and/or from industry. Most Member States have a documented data strategy and apply the 'IOC Oceanographic Data Exchange Policy'. This includes the timely, free and unrestricted international exchange of oceanographic data and associated metadata.

*43* The Data Centres maintain a well-rounded staff and a majority of the Member States have seen an increase in budget and working staff or remained the same. Travel and training resources for most centres are critical to benefit from membership in IODE primarily through the contacts in other centres and the experience they share. There continued to be inconclusive information to analyze the annual operational budget for data centres (excluding staff cost) [converted into US Dollars], though the majority of Member States have indicated that it has remained the same or slightly increased. Member States are encouraged to comment on how a revised series of budget questions should be included in future surveys.

*44* The Member States continued to collect and archive all types of oceanographic data and more of these data had become available online. The majority had a discovery metadata catalogue which increasingly was made available online. The range of data types handled by Member States included: physical, chemical, biological, marine meteorology and atmospheric data, geological and geophysical data. Most data centres processed delayed-mode data along with some real-time data. Access to real-time data and GIS were increasing throughout the community.

*45* An important outcome of the survey was that all Member States agreed that quality control should be a priority including reviewing and revising existing manuals where appropriate. A limited number of Member States continued to provide data to WDCs Oceanography. A clarification on the future of the WDCs will be further covered under Agenda Item 8.2. There has been an increase in the digitization of data and the preservation of data.

*46* Member States continued to increase their role in IODE activities including participation in JCOMM/ETDMP, OBIS, OceanDataPortal, the Standards Project and other IODE activities (i.e. GE-BICH, GE-MIM, GODAR, GOSUD, GTSPP and Marine XML). There was also active participation in SeaDataNet, CLIVAR and other major science programmes.

*47* Results from the Marine Information survey showed that a majority of information centres were research institution libraries and had seen an increase in online users and number of requests for 2009–2010. They participated fully in IODE global activities and increased their participation in OceanDocs and OceanExpert. There has been a dramatic increase and demand for online products.

*48* The IODE capacity building strategy implemented through the ODINAFRICA and ODINCARSA projects had substantially increased the capacity of the participating countries as reflected in the national reports. The newer ODIN programmes (ODINECET, ODINWESTPAC, and ODINBLACKSEA) continued to develop. Many Member States have hosted scientists and data managers from IODE data centres that have been mutually beneficial and have participated in IODE training courses.

*49* Participation in OceanExpert was now at an all time high but experts were urged to remember to update their records regularly. Member States have increased their participation in IODE training through OceanTeacher by attending courses and volunteering experts for training.

*50* Direct financial support to IODE in 2009–2010 through the IOC and sending a visiting expert to the IOC Project Office for IODE in 2009–2010 for a period of 3-12 months continued to be low due to the uncertain budget situations throughout the IODE community. Member States were encouraged to provide extra-budgetary funds to support IODE activities.

*51* **The Committee instructed** the Secretariat to make the following modifications in the survey mechanism for the next Session: (i) ensure that a PDF version of the survey is available online; (ii) ensure that a PDF version is generated after filling the online survey; (iii)

provide a quantitative and trend analysis (including maps and charts) of the results as compared to previous inter-sessional periods; (iv) indicate whether distributed data centres respond faster or slower than centralized data centres; and (v) examine responses looking for patterns based on type of data centre (centralized or distributed), by region, or ease of connection to the Internet. It was noted that in the case of distributed centres it may be difficult to provide accurate aggregated information.

## 4.2 REPORT OF THE IOC PROJECT OFFICE FOR IODE

*52* The Technical Secretary and Head of the IOC Project Office for IODE reported on activities of the IOC Project Office for IODE during the period 2009–2010.

*53* He recalled that the IOC Project Office for IODE was established in April 2005 with the following objectives: (i) to provide a creative environment facilitating the further development and maintenance of IODE Projects, services and products with emphasis on improving the efficiency and effectiveness of the data and product/service stream between the stage of sampling and the user; and (ii) to assist in strengthening the capacity of Member States to manage oceanographic data and information (with special attention to the developing countries) and to provide ocean data and information products and services required by users. It was further decided that the IOC Project Office for IODE would further develop, strengthen and maintain IOC/IODE ocean data and information management training programmes and training tools; it would provide an environment ('think tank') where ocean data and information experts and students can work, meet and discuss; and it would support the development, hosting and maintenance of IOC/IODE's ocean information systems and related public awareness tools.

*54* Mr Pissierssens provided the following statistics related to events organized or hosted by the IOC Project Office for IODE during 2009–2010:

| | ***2009*** | ***2010*** |
|---|---|---|
| *Training Courses* | *8 (180 participants)* | *8 (155 participants)* |
| *Meetings, Workshops and Conferences* | *13 (180 participants)* | *15 (181 participants)* |
| *IODE events held elsewhere* | *6 (119 participants)(*)* | *7 (97 participants)* |

(*) includes IODE-XX

*55* Compared to 2007–2008 (17 courses, 288 students) this represented an increase of 47 students (16 courses, 330 students in 2009–2010). Meetings, workshops and conferences showed a marked increase compared to 2007–2008: 16 events in 2007–2008 vs 28 events in 2009–2010 with a total of 296 participants in 2007–2008 vs. 363 in 2009–2010. It was noted that some participants were now self-funded.

*56* In addition to the events organized or hosted by the IOC Project Office for IODE in Ostend, Belgium an additional 14 events (7 in 2009 and 7 in 2010) were hosted in other venues and often co-sponsored by Member States.

*57* Additional statistics are available in Document IOC/IODE-XXI/42 (*Renewal of the MoU between the Flanders Marine Institute (VLIZ) and IOC regarding the IOC Project Office for IODE, Ostend, Belgium*).

*58* The IOC Project Office for IODE celebrated its 5th anniversary on 21 April 2010. In December 2009 the Memorandum of Understanding (MoU) between UNESCO/IOC and the Government of Flanders expired. In accordance with the Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission and for the Establishment of

Decentralized Offices (IOC/INF-1193 of 8 June 2005) the renewal of the MoU requires formal approval by an IOC Governing Body through a Resolution. As the decision by the Government of Flanders on continued support of the Office was not made by June 2009 (when the IOC Executive Council met) it was not possible to submit the request to renew the MoU at that time. Further discussions on the renewal of the MoU will be held under Agenda Item 4.3.1.

*59* In terms of staffing Mr Pissierssens reported that Mr Mika Odido (Kenya), transferred from the UNESCO/IOC Office in Nairobi, Kenya to the IOC Project Office for IODE, Ostend to coordinate IODE's regional activities; Mr Aditya Kaokdkar (India) joined the Office in October 2009 as IT expert; Dr Wouter Rommens, IODE Training Coordinator left the organization in October 2010. He was replaced by Dr Claudia Delgado (Portugal) who joined the Office in February 2011. In March 2011 the IOC Project Office for IODE staffing was composed of:

- Ms Kristin de Lichtervelde – Administrative coordination (VLIZ/Flanders)
- Ms Lies Groen – Documentalist (VLIZ/Flanders)
- Mr Mark Van Crombrugge – IT specialist (VLIZ/Flanders)
- Ms Claudia Delgado - OceanTeacher Academy manager (VLIZ/Flanders)
- Mr Aditya Kakodkar - IT specialist (IOC)
- Mr Mika Odido – Regional activity coordinator (IOC)
- Mr Peter Pissierssens – Head, IOC Project Office for IODE (IOC)

*60* In addition the Project Office received three short-term experts:

- Mr Li Zhanbin (China): January–March 2009
- Mr James Macharia (Kenya): March–June 2010
- Ms Maria Kalenchits (Estonia): September–November 2010)

*61* **The Committee congratulated** the staff of the IOC Project Office for IODE and its Head, Mr Peter Pissierssens with the success of the Office. **The Committee noted with appreciation** that the concerns that had been raised regarding the sustainability of the Office prior to its establishment had proved to be unfounded.

*62* Mr Pissierssens thanked the Committee for its appreciation but pointed out that the achievements were the result of the commitment of the entire Project Office team. He also expressed his appreciation to Dr Vladimir Vladymyrov who had been the first Head of the Office between its opening in April 2005 and end of 2007 and had started paving the road to success.

*63* The representative from EUMETSAT recalled the successful training course, organised jointly with NOAA and IODE in December 2009 and praised the professionalism and quality of the Project Office facilities and staff. He expressed the wish to continue collaboration with IODE and its Project Office.

*64* **The Committee expressed its gratitude** to the Government of Flanders and Flanders Marine Institute (VLIZ) for the substantial support provided.

### 4.2.1 Renewal of the MoU for the IOC Project Office for IODE

*65* This Agenda Item was introduced by the Technical Secretary referring to Document IOC/IODE-XXI/42 (*Renewal of the MoU between the Government of Flanders and IOC regarding the IOC Project Office for IODE, Ostend, Belgium*) and IOC/IODE-XXI/42 add.

(*Amendment: Renewal of the MOU between the Flanders Marine Institute (VLIZ) and IOC regarding the IOC Project Office for IODE, Ostend, Belgium*).

*66* It was recalled that the IOC Project Office for IODE was established through Resolution XXII-7 (International Oceanographic Data and Information Exchange (IODE) (2005), which endorsed Recommendation IODE-XVII.4 "Establishment of the IODE Project Office" (2003). It was noted that, as part of the recommendation to the IOC Assembly a business plan was prepared (IOC/INF-1187): IODE Project Office – Business Plan).

*67* The UNESCO/IOC Project Office for IODE was officially inaugurated on 25 April 2005. It was noted that the procedure to establish the Project Office was in compliance with "Guidelines for the Establishment of IOC Decentralized Offices" adopted by the IOC Assembly during its twenty-second Session and published as Document IOC/INF-1193. In order to formalize the hosting of the Office by Belgium a Host (Seat) Agreement was signed between UNESCO and the Government of Belgium. In addition a Memorandum of Understanding (MoU) was signed between the Flanders Marine Institute (VLIZ) – representing the Government of Flanders-, and the IOC. The MoU came into effect on 1 January 2006 and was set to terminate after a period of four years, on 31 December 2009.

*68* It had been planned to submit the recommendation for renewal of the MoU to IODE-XX (May 2009) and subsequently to the forty-third Session of the IOC Executive Council (June 2010). Unfortunately this was not possible as the Government of Flanders had not yet approved the continuation of funding for the period 2010–2014 at that time.

*69* **The Committee noted** that the responsibilities of the Office have evolved into the main Secretariat of the IODE Programme and that there should be no "sunset clause" for the Office (as foreseen in the terms of reference for an IOC Project Office as detailed in IOC/INF-1193), and accordingly **expressed the desire** to convert the Office into a "Programme Office". The Technical Secretary informed the Committee that this matter had been submitted to UNESCO's Legal Affairs department. They advised that the Office should continue under its present name as the Office was referred to in the aforementioned Host Agreement as "Project Office". A name change would therefore require an amendment of the Host Agreement which would further delay the renewal of the MoU which might cause administrative difficulties. **The Committee therefore agreed** to maintain the name of the Office as "IOC Project Office for IODE" while noting that the responsibilities of the Office were those of a Programme Office and that no misunderstanding should be allowed in this regard.

*70* The Committee was invited to consider the continuation of the Office as a "Project Office" and to submit the request for renewal of the MoU to the 26th Session of the IOC Assembly (June-July 2011), in accordance with IOC/INF-1193. Document IOC/IODE-XXI/42 details the compliance of the request with the requirements detailed in IOC/INF-1193.

*71* **The Committee adopted** Recommendation IODE-XX1.1 (The UNESCO/IOC Project Office for IODE in Ostend, Belgium).

## 5. ADOPTION BY IODE OF THE OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM (OBIS)

*72* This Agenda Item was introduced by Dr Edward Vanden Berghe (former OBIS Executive Director and ad interim OBIS Programme Specialist), referring to Document IODE/IODE-XXI/43 *(Adoption by IODE of OBIS*).

## 5.1 INTRODUCTION

*73* The Committee was reminded of the history and the accomplishments of OBIS. OBIS was created as the data integration component of the Census of Marine Life (CoML); the latter was a ten-year international framework, involving 2700 scientists from 80 nations, studying marine biodiversity. OBIS has grown beyond the Census, and is an international network of its own, with 20 Thematic or Regional Nodes. In collaboration with the CoML, several highly visible information products have been created. One of these information products is a wall map produced in collaboration with National Geographic. These maps have a very wide distribution, and should bring visibility to the OBIS data.

*74* Through the international Portal, the end user can seamlessly search though 30 million records, extracted from 900 individual data sets. The international Portal was recently updated, making the OBIS system completely compliant with modern web-based standards such as OGC WMS and WFS. It is multilingual, now including English, Spanish, Portuguese and Japanese; it is the ambition of OBIS to provide the search interface in at least all IOC languages, and will work on this with the Regional OBIS Nodes. The search interface strives to offer facilities relevant to ocean sciences, and, for example, allows the query of OBIS species distributions by setting criteria for physical oceanography parameters; the physical oceanography data was sourced from the World Ocean Atlas, and it is hoped that close collaboration with the US NODC, Silver Spring, and other NODCs in the IODE network, will bring further improvements and new functionality to the OBIS Search Interface.

*75* OBIS strives to serve the scientific community, but also to make the OBIS data available to inform the management of marine living resources. To this end, OBIS actively builds relationships with international organizations. OBIS has been collaborating with other partners in the Global Ocean Biodiversity Initiative (GOBI) and with the Convention on Biological Diversity (CBD). OBIS was presented during the 10$^{th}$ meeting of the Conference of the Parties (COP10) of the CBD in Nagoya, Japan, end of 2010, and was mentioned several times as a source for biodiversity information in the report of COP10. Other links with international organizations are with FAO, ISA and UNEP/WCMC, among others. The first Census ended in October 2010; in preparation of this, OBIS has sought affiliation with IOC. During the 25th Session of the IOC Assembly, 16–25 June 2009, it was noted that incorporating OBIS would substantially expand the scope of data coverage by IODE, and IOC Resolution XXV-4 was adopted in which it was decided *inter alia* … to accept OBIS within the IODE Programme and start its integration on a schedule that will ensure a smooth transition of OBIS into IOC.

*76* IOC Circular Letter 2333, issued 16 February 2010, informed Member States that an IOC Trust Fund dedicated to OBIS had been established, and invited Member States to contribute. Several Member States have made a financial contribution (Australia, Brazil, Canada, USA). Rutgers University, New Brunswick, New Jersey, USA, the seat of the former international OBIS Secretariat, offered to host the OBIS Project Office under the conditions spelled out in Document IOC/INF-1193. The Flemish Government offered to assist in organizing meetings, through the IODE Project Office in Ostend. Several organizations have indicated that they are willing to make a contribution in kind, by assisting with the development of the IT Infrastructure and data management tasks. This includes Duke University in Durham, North Carolina, USA; the Ministry of Earth Sciences, Government of India through INCOIS; University of Simon Bolivar in Caracas, Venezuela (Bolivarian Rep. of); and VLIZ in Ostend, Belgium). A first meeting was held in Hyderabad, in the INCOIS offices, from 2 to 4 March 2011. Mechanisms to implement the collaboration between the different institutes involved were discussed and a further meeting was suggested, where actual division of labour will be discussed.

77 Study visits and secondments from staff of OBIS Nodes to the OBIS Project Office are seen as another method of increasing the capacity available to OBIS. Apart from the extra staff time that they would bring into the Project Office, they would increase the cohesion within the OBIS network, and the consistency with which OBIS procedures are applied across the network.

## 5.2 PROPOSED REVISION OF THE IODE STRUCTURE TO ACCOMMODATE OBIS

78 The Committee was reminded of the history of the discussions of incorporation of OBIS in IOC. The decision to incorporate OBIS in IOC, as an activity under its IODE Programme, was taken during the 25th session of the IOC Assembly, held in Paris, from 16 to 25 June 2009 (IOC Resolution-XXV.4). Details on the full process are listed in Document IOC/IODE-XXI/44 (*Establishment of an IOC project Office for the Ocean Biogeographic Information System (OBIS)*).

79 Dr Vanden Berghe recalled that extensive discussions were held on how to implement the integration of OBIS into IODE at the 2008 OBIS managers committee and the OBIS Strategy and Workplan Meeting, held at the IOC Project Office for IODE, Ostend, Belgium, 18–20 November 2009 (See IOC Workshop Report No. 226), . This resulted in the diagram shown in Figure 1. The incorporation of OBIS into IODE will thus require the following adjustments in the structure:

- An IODE Steering Group for OBIS will be created (replacing the OBIS Nodes Managers Committee);
- An IODE Group of Experts on OBIS will be created (replacing the OBIS Science Board and International Committee);
- An IOC Project Office for IODE/OBIS will be created (replacing the OBIS International Secretariat).

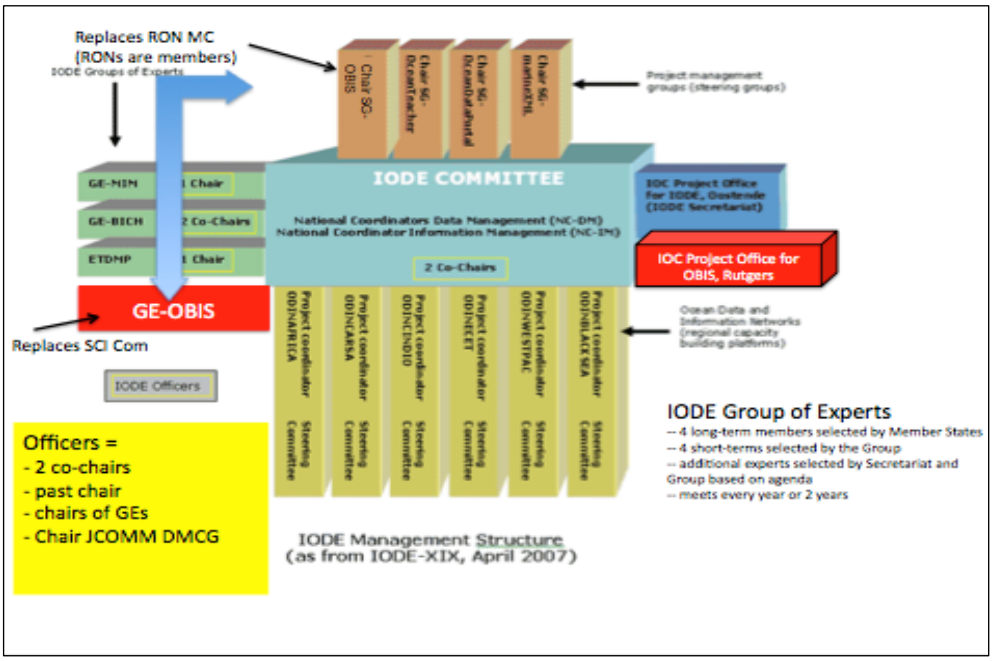


Figure 2: structural diagram of IODE incorporating OBIS

80 An "*Ad hoc* meeting of the IODE Steering Group for OBIS" was held at the IOC Project Office for IODE, Ostend, Belgium between 18 and 19 November 2010. This meeting drafted the Terms of Reference of the new structural elements.

*81* **The Committee adopted** Recommendation IODE-XXI.2 (Establishment of the IODE Steering Group for OBIS–SG-OBIS) and Recommendation IODE-XXI.3 (Establishment of the IODE Group of Experts on OBIS–GE-OBIS).

*82* **The Committee recalled t**he request (through IOC Resolution XXV-4) to the IOC Executive Secretary, in close consultation with the IODE Officers, to draft revised terms of reference for the IODE Committee, taking into account the extended mandate of the Committee as a result of the adoption of OBIS. The Committee also recalled that it revised the objectives of IODE through Recommendation IODE-XVIII.1: "**Recommends** that the Objectives of the IODE Programme be modified as follows:

(i) *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;…"*

*83* **The Committee decided** that a revision of the IODE Objectives was desirable to highlight the application by IODE of the IOC Oceanographic Data Exchange Policy.

*84* **The Committee adopted** Recommendation IODE-XXI.4 (The IODE Objectives).

*85* Regarding the establishment of the IOC Project Office for IODE/OBIS the Committee was reminded that "*the proposal for the establishment of such an Office should be submitted by an IOC Primary Subsidiary Body (in this case the IODE Committee) to the IOC Executive Secretary. The establishment of an IOC Project Office requires formal approval by an IOC Governing Body through a Resolution. The IOC Governing Body shall be provided with a detailed document that includes the needs assessment and a detailed estimation of cost (covering the duration of the agreement), as well as a draft host agreement*" (IOC/INF-1193).

*86* **The Committee adopted** Recommendation IODE-XXI.5 (Establishment of the IOC Project Office for IODE/OBIS at Rutgers University, N.J., U.S.A).

*87* **The Committee noted** that the name of the Office was aimed at indicating the identity of OBIS as a part of IODE.

*88* **The Committee instructed** the Secretariat to prepare the additional required documentation as described in IOC/INF-1193 and to submit these, together with the relevant Recommendations to the 26th Session of the IOC Assembly.

## 5.3 OBIS STRATEGY, MEDIUM AND LONG-TERM OBJECTIVES

*89* Dr Vanden Berghe recalled that the medium term objectives of OBIS were discussed in the *ad hoc* meeting of the SG-OBIS, and identified as follows: data management, IT infrastructure, increasing use of OBIS by data contributors and consumers, and finalizing the transition of OBIS from a project-based activity to a permanent part of the international scientific infrastructure under IOC/IODE.

*90* In order to achieve these objectives, several meetings were proposed: yearly meetings of the SG-OBIS, two-yearly meetings of the GE-OBIS; technical meetings to further the development of the OBIS IT infrastructure; scientific meetings to analyze and publish on the OBIS data holdings. Also, participation in other meetings would be needed to liaise with other international organizations such as CBD, FAO, ISA and others.

*91* The budget requested for OBIS included funds to organize these meetings, and for salaries of staff members. The contribution of Member States, in combination with the offers in kind of institutions within the OBIS community, will allow covering most of the OBIS needs for 2011; a substantial contribution will be needed after that.

## 6. PROGRAMME ACTIVITY REPORTS

### 6.1 GROUPS OF EXPERTS

#### 6.1.1 IODE Group of Experts on Biological and Chemical Data Management and Exchange (GE-BICH)

*92* The Agenda Item was introduced by Dr Gwenaëlle Moncoiffé referring to Document IOC/IODE-XXI/12 (*Report of the IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GE-BICH)*).

*93* The GE-BICH met for its fifth session at the IOC Project Office for IODE, 17 to 20 January 2011. Substantial progress was made on its workplan for the period 2009–2011. This included the development and maintenance of a GE-BICH wiki (https://sites.google.com/site/gebichwiki/home); the compilation of lists of vocabularies needed for the management and exchange of biogeochemical data; organization of the "First IODE Workshop on Quality Control of Chemical Oceanographic Data Collections" on 8-11 February 2010 with outcomes presented at IMDIS 2010 and published as IOC Workshop Report No. 228; the submission of a quality flag scheme proposal to the Ocean Data Standards process; the compilation of information about quantitative test criteria for biological and chemical data quality control; a study of the current provision and access of chemical and biological data via the SeaDataNet and the ODP portals.

*94* The Group made a number of recommendations including (i) that the device vocabulary catalogue currently maintained by Dr Roy Lowry at BODC be submitted to Ocean Data Standards (ODS); (ii) that portals such as ODP, SDN, and OBIS be made interoperable as agreed at IODE-XX; (iii) that ODP provide access to stand-alone data software tools such as ODV and DIVA and employ BODC Parameter Usage Vocabulary for biological and chemical data; (iv) that SDN identify a point of contact to address data quality issues in climatologies generated by DIVA. The group also called on NODCs to send or serve their publicly available chemical and biological data to international data systems such as ODP and SDN, and called on developers to ensure that these systems are ready to serve them.

*95* GE-BICH also recommended that the IODE Committee address data flow procedures including data flow to the WDC Oceanography, Silver Spring, USA and its WOD product and identified the need for the long-term and permanent archival for all oceanographic data, including OBIS data products. The Group stressed that close collaboration should be established between OBIS nodes and IODE NODCs to ensure efficient and effective data flow of biogeographical data. It also called on IODE to recommend that NODCs liaise with Government funding agencies to ensure that biological and chemical ocean data are sent to NODCs and that NODCs are properly resourced to curate these data.

*96* Dr Moncoiffé informed the Committee that the GE-BICH needed to renew 3 of its long-term members. In this regard IOC Circular Letter 2369 was issued on 31 January 2011 inviting Member States to nominate suitable candidates. Until the deadline of 10 March 2011 only 5 nominations were received. Dr Moncoiffé informed the Committee that Dr Hernan Garcia (USA), and Dr Sergey Konovalov (Ukraine) had been elected at the Co-Chairs of GE-BICH. **The Committee decided** that a new Circular Letter should be issued. Member States that already nominated a candidate by 10 March 2011 will not need to re-submit and their nominations will be taken into account. The deadline for the nominations will be end of May 2011.

*97* The GE-BICH-V workplan included completion of on-going work on vocabularies and quality control procedures. GE-BICH also plans to (i) start a review of selected parameter code definitions; (ii) set up a working group on the standardization of measurement units

reporting; (iii) set up a working group to improve input to Ocean Teacher. GE-BICH plans to organize a meeting in 2012 which would consist of an ad-hoc GE-BICH meeting with the new long-term members followed by the 2nd workshop on data QA/QC to further develop quantitative and objective test criteria for selected chemical and biological data. The sixth session of GE-BICH is planned for 2013.

*98* **The Committee congratulated** GE-BICH for the good work that has been achieved during the inter-sessional period, and **encouraged** GE-BICH to continue the good work. **The Committee noted** the strong collaboration that GE-BICH has established with other groups. **The Committee emphasized** the need to enhance the flow of biological and chemical data to the NODCs, and their availability through the Ocean Data Portal. **The Committee urged** GE-BICH to explore further collaboration with other projects, such as the SeaDataNet 2, which will have a strong biological component.

*99* **The Committee approved** the GE-BICH-V work plan, while **referring** discussions on financial implications to Agenda Item 13.

### 6.1.2 IODE Group of Experts on Marine Information Management (GE-MIM)

*100* This Agenda Item was introduced by Ms Linda Pikula (Chair, GE-MIM) referring to Document IOC/IODE-XXI/13 (*IODE, GEMIM*), Document IOC/IODE-MIM-XI/3 (IODE Group of Experts on Marine Information Management, Eleventh Session), Document IOC/IODE-XXI/22 (*ASFA*), Document IOC/IODE-XXI/23 (*OceanDocs and Aquatic Commons*), Document IOC/IODE-XXI/24 (*OceanExpert*) and Document IOC/IODE-XXI/25 (*OpenScienceDirectory*).

*101* Ms Pikula informed the Committee that the 11th Session of the IODE Group of Experts on Marine Information Management (GE-MIM-XI) was held at the IOC Project Office for IODE, Ostend, Belgium from 25 to 28 May 2010. The Group had re-elected Ms Linda Pikula as its Chair.

*102* Ms Pikula informed the Committee that the GE-MIM had been particularly active during the past inter-sessional period, implementing a wide range of activities.

*103* Regarding OceanDocs the Committee was informed that cooperation has been established with FAO-KCEW on AgriOceanDSpace. This will lead to making available materials to both the FAO and IOC/IODE user communities. Cooperation between the IAMSLIC (International Association of Marine and Aquatic Science Libraries and Information Centers) will also be further developed through the hosting, by the IOC Project Office for IODE, of the IAMSLIC repository Aquatic Commons beginning in January 2011. A pre-conference training workshop on OceanDocs is planned to be held before the IAMSLIC Conference scheduled for October 2011 in Zanzibar, Tanzania.

*104* A MIM Communications Strategy document has been completed and approved by the GE-MIM. This document was prepared as a follow-up to the IODE Review, which indicated that IODE members were not fully aware of the services and products available through the GE-MIM. The Aims and Objectives of MIM Communications Strategy are:

- To provide communication channels and tools, which promote effective and efficient exchange of factual and intellectual information among IOC stakeholders through the MIM activities of IODE.
- To facilitate positive outcomes for marine information management by encouraging, supporting and developing a culture of strong communication both within the IODE and with important and relevant stakeholders in the wider library & information management community.

*105* The Strategic Objectives are:

- Clear and coordinated identification of current issues and future priorities for marine information management
- An IODE-wide culture of sharing of knowledge & expertise on the topic of marine libraries and marine information.
- Strong understanding of MIM issues and priorities by the IODE Officers Group
- Increased involvement of MIM National Coordinators in establishment of new MIM projects, and maintenance of existing services and products (see Role of MIM National Coordinators)
- A strong sense of community & support shared by all MIM National Coordinators
- Improved synergies with external stakeholders and other agencies e.g. UN Agencies, Government Organizations, NGOs, Professional Societies and relevant programmes

*106* Ms Pikula recalled that the "IOC Strategic Plan for Oceanographic Data and Information Management (2008–2011)" adopted by the twenty-fourth Session of the IOC Assembly (19–28 June 2007) through IOC Resolution XXIV-9 did not include marine information management elements.

*107* **The Committee decided** to include more MIM elements in the next version of the IOC Strategic Plan for Oceanographic Data and Information Management. Further discussion on this topic is covered under Agenda Item 11.

*108* Ms Pikula informed the Committee that much of the GE-MIM-X work plan had been accomplished, e-copyright legislation is being monitored and taught during the OceanTeacher Academy workshops, a GE-MIM liaison has been assigned to the IODE Caribbean Marine Atlas projects, improved access to e-journals has been achieved through the aggregation of journals listed as available through OpenScience Directory AZ, in cooperation with the University of Hasselt, and EBSCO, and our OceanDocs Repository is engaged in co-operative projects with FAO, ASFA, IAMSLIC, and other European Repository projects. These collaborative projects are amongst GE-MIM's most important accomplishments in 2010.

*109* Additionally, the IODE 50th Anniversary Bibliography has been prepared by GE-MIM, Mr Marc Goovaerts (Hasselt University, Belgium), and Maria Kalenchits (Estonia). It is available from the URL: http://biblio.iode.org/

*110* Ms Pikula then informed the Committee about the work plan and budget for the next inter-sessional period as proposed by GE-MIM-XI. This focuses on (i) cooperation in the SCOR/IODE/MBL WHOI data publication project; (ii) cooperation with OBIS; (iii) cooperation in ASFA; (iv) establishment of a formal relationship with IAMSLIC; (v) assisting ODINs in the selection of a new library management system software platform; (vi) further assisting ODINs with the development of e-repositories; (vii) identifying arrangements for mentoring programmes and internships; (viii) further development of MIM courses in OceanTeacher; (ix) further development of OceanDocs and assistance to Aquatic Commons; (x) further enhancement of OceanExpert; (xi) studying the feasibility of continuation of the Ocean Portals (African Ocean Portal and Portal Oceanico); (xii) collaboration of GE-MIM in the Coastal Atlases projects; (xiii) development of specific bibliographies (like IODE 50th anniversary); and (xiv) contribution to the 2012–2015 IOC Strategic Plan for Oceanographic Data and Information Management.

*111* Detailed discussions of ASFA, OceanDocs and Aquatic Commons, OceanExpert, and OpenScienceDirectory are discussed Agenda Items 6.2.8, 6.2.9, 6.2.10 and 6.2.11. respectively

*112* **The Committee commended** GE-MIM for the progress made in implementing the planned activities. **The Committee noted** the excellent collaboration established with IAMSLIC and FAO/ASFA. **The Committee encouraged** GE-MIM to enhance its collaboration with ODIN's in order to strengthen activities at the regional level.

*113* **The Committee approved** the Report of the eleventh Session of the IODE Group of Experts on Marine Information Management and the Recommendations therein, while referring discussions on financial implications to Agenda Item 13.

*114* **After considering** Document IOC/IODE-MIM-XI/5rev., **the Committee instructed** the Secretariat to publish the "IOC Communications Strategy for Marine Information Management" in the relevant IOC series.

### 6.1.3 JCOMM/IODE Expert Team on Data Management Practices (ETDMP)

*115* This Agenda Item was introduced by Mr N. Mikhailov, Chair of the ETDMP, referring to Document IOC/IODE-XXI/14 (*Report on Intersessional Activities of the ETDMP*). He noted that the work was aimed at fulfilling the IODE-XX and JCOMM-III recommendations. The main ETDMP activity was concentrated on the following directions: (i) conducting the IODE/JCOMM Standards Process (ODS); (ii) improving the metadata management; (iii) development of the IODE Ocean Data Portal (ODP) Project including the participation in the JCOMM Pilot Project for WIGOS.

*116* In accordance with the work directions, three ETDMP Task Teams were created at the JCOMM/IODE ETDMP-II meeting in April 2010 and the work plans were agreed upon.

*117* Mr Mikhailov recalled further that the IODE Committee (IODE-XX) adopted Recommendation IODE-XX.2 – The Ocean Data Standards Pilot Project. The recommendation encourages all IOC Member States, Programmes and relevant organizations to submit standards for consideration, contribute to the evaluation process, and adopt recommended standards at the earliest opportunity. This process is coordinated by the ETDMP (Task Team for Ocean Data Standards, ODS, managed by Paul Ng'Ala Oloo, Kenya).

*118* Mr Mikhailov noted that the process of receiving recommended standards from Member States has been very slow. The success of this process is highly dependent on active participation of all IOC Member States, Programmes and related organizations by submitting suitable standards for consideration. The ETDMP ODS Task Team will liaise with Ocean Data Portal (ODP), SeaDataNet Technical Task Team and the GE-BICH to expand the ODS process. Details on work done under the Ocean Data Standards were discussed under Agenda item 6.2.1.

*119* Mr Mikhailov also provided an overview of the ETDMP activities in the field of metadata management. He noted that the relevant ETDMP Task Team, managed by Nicola Scott of the UK, provided the compilation of the basic ISO/OGC standards and also specifications and other materials from ODP and SeaDataNet for review and comparisons.

*120* Mr Mikhailov noted further that the most significant outcomes were achieved with the ODP development and he listed them as follows:

- training courses were provided for the ODP distributed data system establishment for ODINBlackSea and ODINWESTPAC countries;

- the light Data Provider package and new ODP services were developed and distributed for use;
- the organizations and programmes that are part of the JCOMM Pilot Project for WIGOS provided the data sets into the ODP distributed system: this included Argo temperature and profile data, Russian National Oceanographic Data Centre resources, upper-ocean T & S gridded in situ fields from the ISDM (Canada).
- the preparation of a preliminary technical design document (white paper) for ODP (V.2.) has been completed.

*121* Mr Mikhailov informed the Committee of the proposed work plan and budget for the next inter-sessional period. Some support will be available from WMO for meetings of the DMCG and ETDMP during 2012–2013 (to be approved by WMO Cg-XVI).

*122* The representative of EUMETSAT, Dr Simon Elliott, informed the Committee that WMO has two inter programme expert teams, whose participation in the work of the ETDMP teams could lead to mutual benefits for all the groups involved. These are the Inter Programme Expert Teams on (i) Metadata, Data and Interoperability –IPET-MDI, and (ii) Data Representation and Codes –IPET-DRC. He noted that the representation of the oceanography communities in the IPET-DRC has been useful in reducing duplication of effort and working towards semantic and syntactic interoperability, and helping to facilitate data access for the global community.

*123* **The Committee commended** Mr Mikhailov on the achievements of the ETDMP in the period under review.

*124* **The Committee approved** the work plan submitted by ETDMP while referring discussions on financial implications to Agenda Item 13.

## 6.2 PROJECTS

### 6.2.1 JCOMM/IODE Ocean Data Standards Pilot Project

*125* Mr Paul N. Oloo introduced this Agenda Item referring to Document IOC/IODE-XXI/15 (*IODE/JCOMM Ocean Data Standards Pilot project*).

*126* A joint IODE/JCOMM Standards meeting held in January 2008 developed a process to accept, evaluate and recommend proposals for community wide standards for marine data and information management and exchange.

*127* As a result of this meeting, the IODE Committee (IODE-XX) adopted Recommendation IODE-XX.2 –The Ocean Data Standards Pilot Project, which encourages all IOC Member States, Programmes and relevant organizations to submit standards for consideration, contribute to the evaluation process, and adopt recommended standards at the earliest opportunity. This process is coordinated by the ETDMP through recommendation of IODE-XX.

*128* JCOMM-III in November 2009 endorsed a number of priorities for the DMPA for the next inter-sessional period, including developing standards and best practices in the marine community through the IODE/JCOMM Standards Process. JCOMM-III also adopted Recommendation 7.3/1 (JCOMM-III) –Development of Data Management Standards, which recommends Members/Member States: (i) to submit their proposals to the JCOMM-IODE Ocean Data Standards Pilot Project (ODS) for wide community adoption; and (ii) to implement the recommended standards in agencies in their own countries at the earliest possible date.

*129* JCOMM/IODE have prepared and published an online Catalogue of Best Practices and Standards for integrating of instrument best practices and related standards among the marine meteorological and oceanographic communities. The web site provides access to over 60 publications of WMO and IOC. Further work needs to be carried out to review the publications and documents to identify deficiencies, duplication, discrepancies, potential for cross-referencing, and to make recommendations to address those issues.

*130* Four submissions have been received: (i) Recommendation to Adopt the International Standard ISO 3166 for Country codes; (ii) Recommendation to Adopt the International Standard ISO 8601 for Date and Time; and (iii) SeaDataNet Common Data Index (CDI) profiles based on ISO 19115 for exchange of oceanographic and marine meteorological data; (iv) Proposal to adopt a Quality Flag Scheme Standard for oceanographic and marine meteorological data exchange. The first two submissions have successfully passed through the review process and the other two submissions have been submitted for expert review.

*131* The process of receiving recommended standards from Member States has been very slow. The success of this process is highly dependent on active participation of all IOC Member States, Programmes and related organizations by submitting suitable standards for consideration. The Meeting of a Standards Group of Experts as proposed in the previous workplan was not undertaken; therefore a meeting of the ODS Pilot Project is proposed with the objective of harmonizing the Instrumental observations and data management for physical and non-physical variables in ocean community application during the year 2011 and in 2012–2013.

*132* Some standards have been identified for submission to ODS, they include Latitude, Longitude and Altitude based on ISO 6709, Units, Platform/Instruments, Institutions, Ontology, Taxa and QC procedures (dependent on parameters). The ODS Task Team will liaise with other Task Teams in ETDMP on these standards proposals. Other standard proposals from the ETDMP Task Teams will also be considered. The SeaDataNet Technical Task Team has been approached to consider submitting the Sea Level Quality Control, Cruise Summary Report (CSR), SeaDataNet device categories –L05 and ODV4 ASCII format standard proposals. The IODE Workshop on QC/QA of Chemical Oceanographic Data in February 2010 GE-BICH agreed to submit a schema for five data processing levels for data management to the ODS process. The ETDMP through ODS will follow up with GE-BICH to ensure these proposals are submitted. ETDMP will also play a more proactive role in soliciting standards submissions.

*133* Some delegates inquired about the status of the CDI submission. Mr Oloo noted that there had been only two reviewers, not enough to allow for an adequate evaluation and so further review was to be sought.

*134* The IODE Co-Chair re-iterated the requirement for greater participation in submitting proposals and in evaluating them. The Committee was reminded that the adoption of a standard does not commit an organization to immediately implement it. Rather, the ODS process recognizes that implementation can take some time. Importantly, having an adopted standard provides a target to build towards as resources permit. It was recognized that agreement on a single standard might prove challenging. Still the discussion process was important to help reduce the number of ways to attack problems and thereby develop fewer practices and so improve interoperability as these fewer strategies are adopted.

*135* Given that the ODS is a Pilot Project, it was questioned when the Pilot Project would be reviewed to assess if it should be discontinued or made a permanent activity. The IODE Co-Chair responded that no time frame was originally set, in recognition that there would be some unknown period for this to fully develop. A review is an important milestone that should be considered in future work plans.

*136* **The Committee urged** national experts to actively participate in the pilot project by submitting proposals and by reviewing proposals –especially now for the quality flag proposal as this will have implications for all data centres.

*137* The Committee was also reminded that there was still unfinished work to support the Catalogue of Best Practices. It was noted that this will be addressed during the ODS Pilot Project meeting planned to take place later in 2011. It was recalled that the IOC Project Office for IODE would undertake further technical work to improve the web site as requested by the ETDMP.

### 6.2.2 IODE OceanDataPortal

*138* This Agenda item was introduced by Dr Sergey Belov referring to Document IOC/IODE-XXI/16 (*IODE Ocean Data Portal*)**.** He recalled that a high priority had been assigned to invite new data providers from NODCs, DNAs, and IODE related projects. During the inter-sessional period 12 data providers have been connected and are providing access to 60 datasets with more than 1,000,000 profiles. The US NODC and ISDM (Canada) supplied their data using the ODP Light Data Provider software hosted at the IOC Project Office for IODE, Ostend. It will be recalled that the Light Data Provider (LDP) has been developed in order to respond to security concerns expressed by some Members/Members States. The LDP is an extension of the Data Provider functionality of the ODP which allows integration of data from data centres unable to install the Data Provider software. LDP offers remote registration of local datasets and provides deployment of the ODP distributed data system without software installation at the data centre side. The LDP allows participating organizations to generate the appropriate discovery metadata files and to remotely load local data into the ODP distributed data system, thus providing interoperability with the IODE ODP and the WMO WIS. Dr Belov noted that the IODE ODP has been designed to be interoperable with the WIS as a Data Collection or Production Centre (DCPC).

*139* Dr Belov informed the Committee that, following the IODE-XX recommendation to develop interoperability arrangements with the SeaDataNet project, a document recommending draft technical specifications of the IODE ODP and SeaDataNet interoperability has been created. In the document it was proposed to focus on interoperability at the portal-to-portal. The following interoperability arrangements were outlined: (a) metadata exchange; (b) data discovery; (c) data access and delivery to users; and (d) system monitoring and report. Tasks for the implementation phase include adoption of common vocabularies, discovery metadata harmonization for ODP-SDN exchange, harmonization of user identification and interoperability between IODE ODP and SDN.

*140* Documentation and two web sites have been developed for the IODE Ocean Data Portal: the IODE ODP website www.oceandataportal.org which provides basic information for general users, technical information (Data Provider software, manuals and documentation, services, formats and dictionaries), a discussion forum, Frequently Asked Questions (FAQ) and training materials; and the IODE ODP portal site http://odp.oceandataportal.net which provides access to data from the contributing organizations, including the discovery service, viewing service, analysis service and download service.

*141* During the inter-sessional period new versions of the ODP software components have been released. The latest software updates and technical documentation are available from the www.oceandataportal.org web site.

*142* Dr Belov informed the Committee of the proposed work plan and budget for the next inter-sessional period. He recalled that the financial requirements were already discussed under Agenda Item 6.1.3 (ETDMP) and that they would focus on the establishment of IODE ODP nodes in various regions. In addition support was requested to organize a meeting of

the IODE Steering Group for the IODE ODP, in collaboration with WMO. Dr Belov also informed the Committee that technical development work will continue to be carried out by the Russian NODC as an in-kind contribution to IOC/IODE, and that the technical work required to "connect" NODCs to ODP will be provided by the respective Member State as an in-kind contribution to IOC/IODE.

*143* Some Member States (Republic of Korea, Australia) noted that they would soon contribute data through the ODP. Argentina remarked that they were in the process of adopting the ODP for national use.

*144* Questions were raised about the relationship of the ODP connection mechanism to WIS in relation to regional systems, particularly SeaDataNet. Dr Belov explained that particularly in the case of SeaDataNet, a portal to portal connection was being made. There were still some technical issues to resolve, but that this would be facilitated by the development of version 2 of ODP, expected to become operational in mid 2012.

*145* The Chinese delegation noted that the IODE ODP has been designed to be interoperable with the WIS and has been designated as a Data Collection or Production Centre (DCPC) by WMO. Given that the IODE ODP is an operational system established and maintained by IOC Member States through the IODE programme and taking into account the equitable cooperation between IOC and WMO, consideration should be given to designating the IODE ODP to an upgraded level in the WMO/WIS.

*6.2.2.1 Cooperation with WMO/WIS*

*146* This Agenda item was introduced by Mr Greg Reed referring to the document Pilot Project for the integration of marine meteorological and other appropriate oceanographic observations into the WMO Integrated Global Observing System (WIGOS) (WIGOS Pilot Project V —JCOMM Pilot Project for WIGOS)— Project Report (available at http://www.wmo.int/pages/prog/www/wigos/marine_pp.html) and he noted that IODE has been an active partner in the JCOMM Pilot Project for WIGOS. WIGOS is a concept for a comprehensive, coordinated and sustainable system of observing systems based on the observational requirements of all WMO Programmes and Co-sponsored Programmes (including IOC). This Pilot Project has been an important contribution to the development of WIGOS and the WMO Information System (WIS). WIGOS will ensure the availability of required data and information and facilitates access through the WIS according to identified requirements.

*147* Due to the important synergies that existed with the IODE Ocean Data Portal (ODP) project, a joint Steering Group was established to coordinate the development of the Pilot Project and to provide liaison with appropriate WMO and IOC programmes and subsidiary bodies. The "*Joint Steering Group for the IODE Ocean Data Portal and the JCOMM Pilot Project for WIGOS*" has been co-chaired by Mr Reed.

*148* The Pilot Project identified three key deliverables: (i) document and integrate instrument best practices and related standards, (ii) build marine data systems that are interoperable with the WIS, and (iii) promote quality management and standards through compliance with the WMO Quality Management Framework (QMF).

*149* The Pilot Project worked closely with the IODE to ensure the interoperability of the IODE ODP with the WIS as a Data Collection or Production Centre (DCPC). This provides increased accessibility to the data holdings in the IODE oceanographic data centres and resulted in improved, multidisciplinary access to data. The JCOMM/IODE Standards process provided a framework for the Pilot Project to further the development of appropriate widely accepted standards to address issues such as quality control procedures, data collection and

exchange formats, and products using the observational data. The catalogue on JCOMM best practices and standards (http://bestpractice.iode.org/) provides access to over 60 publications of WMO and IOC.

*150* The two-year Pilot Project concluded in December 2010 and its legacy includes rationalized documentation on instrument best practices and standards, the establishment of regional marine instrument centres, integration of marine datasets through interoperability with the WIS, and promoting quality management and standards. A list of legacy recommendations is included in the Pilot Project Report.

*151* The IODE Co-Chair noted that the project report would be considered by the next WMO Congress (Cg-XVI). JCOMM has also been invited to present a poster at the WMO Congress. It was expected that WMO will recommend continuation of WIGOS to the implementation phase to begin in 2012 and that JCOMM and IODE will make a further contribution to WIGOS.

*152* Some delegates asked about the potential for the exchange of duplicate information through the WIS, and this was also a concern expressed by GE-BICH. The chair of the committee noted that every data set offered to WIS is accompanied by a metadata record that explains the sources and content of a data set. It is expected that different versions of data will appear on the WIS, but these would represent versions with different value-added activities having been executed on the data. A user would use the metadata to decide which version was most desirable. As for the resolution of duplicates, experience gained in GTSPP will be presented later in item 6.2.5.

*153* The Committee was informed that SeaDataNet-2 would also be tackling the question about how to detect duplications in data sets, and that this experience would be helpful to IODE Member States.

*6.2.2.2 Cooperation with SeaDataNet*

*154* The Committee invited the SeaDataNet representative to provide a brief report on the progress of SeaDataNet (phase 1) and submission of SeaDataNet (phase 2) and the role of IODE in the latter.

*155* Dr Lesley Rickards, on behalf of the SeaDataNet project, provided an update on its activities. The project (2006–2011), funded by the EU under FP6 Research Infrastructures, will conclude at the end of March 2011. It has largely achieved its objectives by developing and implementing an operational pan-European infrastructure for marine and ocean data management, providing users and data centres a range of harmonized services, products, standards and software tools. The project has approximately 50 partners from 35 countries comprising NODCs, research institutes, modelling centres, and international organizations.

*156* SeaDataNet has continued to update its metadata catalogues, both in content and technology as well as providing software tools. Catalogues include the European Directory of Marine Environmental Datasets (EDMED), Cruise Summary Reports (CSRs), and the European Directory of Ocean-observing Systems (EDIOS). These are underpinned by the European Directory of Marine Organisations (EDMO) and European Directory of Marine Environmental Research Projects (EDMERP).

*157* SeaDataNet has focused on establishing common standards and on applying those standards for interconnecting the data centres to enable integrated online access to sets of multi-disciplinary, *in situ* and remote sensing marine data, metadata and products. The Common Data Index (CDI) Data Discovery and Access Service uses these standards to provide unified access to the large volumes of marine and oceanographic data sets. These

are managed in a distributed way by the SeaDataNet data centres. Data sets are pre-processed by data centres to agreed common formats. SeaDataNet is sharing its technologies and expertise by building bridges to other established infrastructures in the marine domain and through other European projects such as Geo-Seas, Upgrade Black Sea SCENE, CASPINFO, and various EMODnet pilots. Downloaded data sets can be analysed and visualised using the Ocean Data View (ODV) data analysis and visualisation software package and the statistical DIVA tool for making comparable gridded data products at regional and global scale from merged *in situ* and satellite datasets.

*158* Initial work has been carried out to investigate interoperability between SeaDataNet and Ocean Data Portal. Unfortunately, due to the complexity of the task, and time and budget constraints, progress on the portal-to-portal interoperability has not been completed, but will continue in the future.

*159* SeaDataNet infrastructure, it is not yet fully sustainable. Moreover, there are many challenges and recent innovations, which need further development, implementation and operation. Thus in November 2010 a proposal for SeaDataNet II was submitted to the EU FP7 Research Infrastructures programme to upgrade the present SeaDataNet infrastructure into an operationally robust and State-of-the-art pan-European infrastructure for providing up-to-date and high quality access to ocean and marine metadata, data and data.

*160* IODE, through the Technical Secretary, has contributed to the proposal providing a stronger role for IODE through dedicated capacity building tasks (in particular for the North African partners) and ensuring better linkage between training activities/courses and OceanTeacher. A further task relates specifically to interoperability between the SeaDataNet and Ocean Data Portal, to be led by Mr Nikolai Mikhailov and Dr Sergey Belov. In addition, there is a task to ensure that SeaDataNet standards will be submitted to the Ocean Data Standards pilot project.

*161* The SeaDataNet-2 proposal has been reviewed by the European Commission and has received a favourable evaluation report. More news should become available in April 2011.

*162* **The Committee welcomed** the intentions of SeaDataNet-2 to include IODE as a direct partner in SeaDataNet-2, and **urged** SeaDataNet to collaborate with the IODE Project Office to ensure pertinent training material and other documentation should become part of the OceanTeacher resources.

### 6.2.3 Data Publishing (SCOR/IODE)

*163* This Agenda Item was introduced by Dr Gwen Moncoiffé referring to Document IOC/IODE-XXI/17 (*SCOR/IODE/MBLWHOI Library Project on Data Publication*). Started in 2008, this activity assembled 18 experts in April 2010 to review progress on the pilot projects, on assembly and publication of ingested data sets and creation of a digital backbone for traditional data publications. A “Data Publication Challenge for Ocean Data Management” was issued to IODE national oceanographic data centres and also shared with the data management, library, and oceanographic communities through presentations at meetings specific to each community. An enthusiastic response was received; many centres want to get involved in data publication, but none seems to know where to start.

*164* Dr Roy Lowry (British Oceanographic Data Centre, chair of the project) made a presentation at the 22nd International CODATA Conference in October 2010 in Cape Town, South Africa on “Data Centre-Library Co-operation in Data Publication in Ocean Science”. This meeting was an important event to reach the data management community outside the oceanographic domain. The conference established a CODATA Task Team on Data Citation

and Publication. Helge Sagen from the Norwegian NODC agreed to serve on this group to ensure it takes into account the requirements of the established oceanographic data management community. Lisa Raymond (MBLWHOI Library) made a presentation at the October 2010 meeting of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) Annual Conference in Mar del Plata, Argentina. The presentation was very well received by members of the marine libraries community, and generated contact by the Freshwater Biological Association (U.K.), Cemagref (France), and the Rosenstiel School Library (Univ. of Miami, U.S.A.) for more information on the data publication project as well as general information about the role of libraries and data management. The librarians are particularly interested in how the MBLWHOI Library is using its institutional repository to accept datasets. Lisa Raymond also presented a poster at the December 2010 American Geophysical Union Meeting in San Francisco, California, USA. Ed Urban arranged a meeting of the University of Delaware Morris Library with the Dean of the university's College of Earth, Ocean, and Environment (CEOE) in December 2010 to discuss the possibility of a pilot project using the Morris Library's DSpace archive to store data related to papers published by faculty and staff from CEOE.

*165* Dr Moncoiffé then briefly introduced the work plan proposed for the next inter-sessional period: (i) it is proposed to meet once in 2011 to assess progress with the pilot project and to plan the next phase of the project; (ii) a trial dataset of typical complexity has been assembled and discussions are underway with the IODE Project Office to establish 'PublishedOceanData', a parallel DSpace facility to OceanDocs for the digital curation of static snapshots of dynamic data entities; (iii) the BODC group is also working to document best practice for the physical composition (e.g. file formats) and semantic description of the content of such snapshots to ensure confident re-use of the data in decades to come; and (iv) The MBLWHOI Library will be working closely with the Biological and Chemical Oceanography Data Management Office (BCO-DMO), an NSF-funded data centre, to publish datasets related to the "digital backbone for traditional journal articles" use case. BCO-DMO seeks to enhance citation with the assignment of DOIs. This research should be well underway by mid-2011.

*166* Dr Moncoiffé informed the Committee that the required funding for the next inter-sessional period would amount to US$ 10,000 of which US$ 5,000 is being provided by SCOR (for the 2011 meeting).

*167* **The Committee noted** that the statements about data centre participation remained unclear. Dr Moncoiffé informed the Committee that a meeting is under consideration to further elaborate the use cases although no time has yet been set. **The Committee suggested** that information on the planned meeting be widely distributed to encourage wider participation by IODE centres in this work.

*168* **The Committee approved** the work plan, while **referring** discussions on financial implications to Agenda Item 13.

### 6.2.4 Global Oceanographic Data Archaeology and Rescue (GODAR)

*169* This Agenda Item was introduced by Mr Sydney Levitus referring to Document IOC/IODE-XXI/18 (*GODAR project report*). He informed the Committee that IOC Member States continued to support the GODAR project. Germany digitized and made available approximately 7,550 historical (pre-1991) Ocean Station Data casts. These data will be processed and made available as part of the World Ocean Database which is updated online every three months (www.nodc.noaa.gov). The United Kingdom, Sweden, Spain, Norway, Republic of Korea, Ukraine, Japan, Russian Federation, United States of America, other countries and the ICES have also submitted historical data. A backlog of historical data sets has built up because of the oil spill from the Deepwater Horizon accident.

*170* Mr Levitus introduced the proposed work plan for the next inter-sessional period. Work will consist of processing data submitted as part of the GODAR project for inclusion into the World Ocean Database. The backlog of historical data sets was the result of the attention given to building data sets for the Gulf of Mexico and the analysis of data for this region. The GODAR project hopes to have four data managers visit during the next two years. This has proven very helpful in the past for acquiring, processing, and incorporating historical data into the World Ocean Database. Each visit will last one month. In the past the U.S. NODC and the WDC for Oceanography has paid for such visits but now funding has become very limited.

*171* Mr Levitus informed the Committee of the required funding for the next inter-sessional period. This will amount to US$ 5,600/year in 2011, 2012 and 2013 and will be used to fund a one-month expert visits/year to NODC/WDC to assist with GODAR work.

*172* **The Committee thanked** Mr Levitus for his presentation and **congratulated** him on the continuing success and expansion of both the GODAR and WOD activities. The value of this work has been recognized by the scientific community as evidenced by the number of citations of WOD. **The Committee also congratulated** Mr Levitus on his election as a Fellow of the AAAS again noting this is in recognition of the value of his work.

*173* Some participants informed Mr Levitus of additional data in their national archives that they would be submitting for inclusion in WOD. Mr Levitus expressed his thanks and congratulated IODE members on their support to this project.

*174* **The Committee approved** the work plan, while **referring** discussions on financial implications to Agenda Item 13.

### 6.2.5 Global Temperature and Salinity Profile Programme (GTSPP)

*175* This Agenda Item was introduced by Dr Charles Sun, GTSPP Chair, referring to Document IOC/IODE-XXI/19 (*Project Report: Global Temperature and Salinity Profile Programme (GTSPP)*).

*176* In terms of data volumes GTSPP continued to deal in greater volumes of data over the past two-year period. The number of real-time data handled was 4,541,361 profiles covering the period of 2009–2010, increased about 77 % from the period of 2007–2008; while the number of delayed-mode data added to the archive increased about 48% to 111,004 at the end of 2010. Since July 2008, GTSPP started to manage the data set of CTD (Conductivity, Temperature and Depth) profiles derived from marine mammals. The number of the marine mammal-borne CTD profiles acquired by GTSPP was 9,915 in 2008 and has grown significantly to 47,111 and 40,221 in 2009 and 2010, respectively.

*177* GTSPP continued to improve its capabilities of serving the GTSPP data for operations and climate research. The number of bytes transferred covering the period for 2009 and 2010 was 3.09 TB. The following table summarizes the detailed usage statistics of the GTSPP data.

| | GTSPP HTTP Server Statistics | | | | GTSPP FTP Server Statistics | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Files Requested | Distinct files requested | Distinct hosts served | Data transferred (GB) | Files Requested | Distinct files requested | Distinct hosts served | Data transferred (GB) |
| 2009 | 292,064 | 18,041 | 13,277 | 1031 | 2,122,379 | 1,662,865 | 331 | 656.697 |
| 2010 | 107,171 | 26,469 | 12,323 | 556.996 | 2,678,928 | 2,009,484 | 223 | 845.742 |

*178* IODE-XX had noted that the CRC (Cyclical Redundancy Check) is a good candidate to be used as a tool for producing unique identifiers for oceanographic data and for submission to the Ocean Data Standards Pilot Project. GTSPP has incorporated the CRC

algorithm into its data processing stream. Countries implementing the CRC into their XBT data processing systems are Australia, Canada, France and USA NODC continued to monitor the usefulness of the CRC tag to identify duplicates. The results to date are very satisfactory. However, it is clear that care must be taken to ensure software and procedures are carefully carried out.

*179* GTSPP is an active contributor and partner in a number of other international programmes In particular, GTSPP worked with the IODE Ocean Data Portal (ODP) project and NOAA's Environmental Research Division's Data Access Programme (ERDDAP) to make the data available at their Web sites. In addition, GTSPP continued to monitor the real-time GTS data and collaborate with WOD (World Ocean Database) and CCHDO (CLIVAR & Carbon Hydrographic Data Office) in support of an Argo reference data set.

*180* The GTSPP Real-Time Quality Control Manual, First Revision was published as IOC Manuals and Guides No. 22, Revised Edition, in December 2010.

*181* With financial support from IODE, the GTSPP participants met at the IODE project office in May 2010 in Ostend, Belgium. The meeting report is posted at the GTSPP Web site at http://www.nodc.noaa.gov/GTSPP. In addition, two ad hoc GTSPP meetings were organized in conjunction with the Argo Data Management Team annual meeting. One was held in October 2009 in Toulouse, France and the other was in October 2010 in Hamburg, Germany.

*182* Dr Sun then introduced the work plan and budget for the next inter-sessional period 2011–2013: the work plan will include (i) continue to acquire profiles and make real- time & delayed mode profile data available; (ii) continue production of metrics in support of JCOMM OPA and SOT; (iii) complete bi-annual report for 2009–2010; (iv) convene a three-day workshop for design and requirements of the GTSPP NetCDF format revision; (v) complete the evaluation of the use of a CRC in real-time and delayed mode duplicates identification; (vi) complete the GTSPP data user guide manual; (vii) design the GTSPP DVD for use in the IODE training/outreach programmes; (viii) convene a three-day GTSPP bi-annual meeting at the IODE Project Office; (ix) complete the GTSPP training material for use by the IODE Ocean Teacher Programme; (x) conduct two training courses (2012, 2013) on ocean data management (as relevant to GTSPP) in Ostend; (xi) complete the GTSPP database system technical documentation. Dr Sun informed the Committee that the financial requirements for the next inter-sessional period will amount to US$ 39,000.

*183* **The Committee thanked** Dr Sun for his presentation and for continuing to lead this project. Considering the importance of resolving duplicate data in international archives, **the Committee welcomed** the documentation about how the Cyclical Redundancy Check (CRC) mechanism is used in GTSPP and its effectiveness in controlling duplications.

*184* **The Committee noted** that GTSPP appears explicitly in the GCOS Implementation Plan. This Plan details actions to be taken to further the aims of GCOS. **The Committee noted** that it is important that IODE demonstrate its contribution to GCOS. **The Committee recommended** to GTSPP, and other relevant IODE projects that are mentioned in the GCOS Implementation Plan to include a section in its reports that explicitly identifies activities that address GCOS actions.

*185* **The Committee approved** the work plan, while **referring** discussions on financial implications to Agenda Item 13.

### 6.2.6 Global Ocean Surface Underway Data Pilot Project (GOSUD)

*186* Mr Loïc Petit de la Villéon introduced this Agenda Item by referring to Document IOC/IODE-XXI/20 (*GOSUD report for 2009-2010*).

*187* He reported that GOSUD celebrated its 10th anniversary. During the inter-sessional period major work has been done on tools and methods that enable production of delayed mode datasets of a higher quality and to visualize existing (near real time datasets). Mr Petit de la Villéon informed the Committee that the Steering Group for GOSUD had met in Ostend in 2010, where an overall assessment of the Project had been made, and especially of the quality of the data set. The first conclusion was that the quality of the GOSUD could be very different depending on the data provider. In addition it was difficult to provide feedback to the data originator, especially when they were anonymous or "hidden behind the GTS". It was therefore decided to focus mote on well identified providers or on data with good meta-data. This means focusing on data backed by scientific expertise i.e. data from research vessels or well structured network of merchant ships.

*188* The GOSUD project is looking for scientists or data managers to help with data assessment using their regional expertise and with the help of the tools developed within the project. They could be direct partners of the project or contribute from outside the project.

*189* As highlighted in the GCOS implementation plan, there is an important need of surface data and sea surface salinity data. GOSUD has proven the feasibility of data collection, and quality control to maintain a global archive of Sea Surface Salinity data. Robustness of the project is effective. However, most of the partners joined the Project since it began. The partnership of the project must be enlarged.

*190* The first objective of the two coming years is to recruit research vessels that could transmit SSS data either in near real time or after the ship reached port. This could be either non-quality controlled data or data processed in delayed mode. The GOSUD project requests that IODE national representatives support the project by providing SSS data to the project either by opening their archives or by providing recent data. First priority must be put on data derived from research vessels or from merchant ships that operate on regular lines. The second objective is to continue the work on delayed mode data processing by enhancing the existing tools and by setting up regional scientific expertise.

*191* Some members noted their intentions to contribute more actively to this project through provision of data or identifying existing data collected or to be collected. It was noted that although GOSUD is focused on temperature and salinity measurements, the recent inclusion of data from ferrybox data acquisition systems, introduced additional variables. While this was always the intention of GOSUD, these data will provide a concrete test on implementation.

*192* GOSUD remarked that it was not able to provide instrumentation to make the underway measurements. However, the existed other programmes, such as MERSEA, that might be able to provide help this way. GOSUD would be very interested in then providing the management infrastructure for the resulting data collection.

*193* **The Committee recommended** that national representatives support the project by distributing this report in their country and to identify potential contributors either by providing data to the project or by providing scientific or data management expertise that could enhance the quality of the GOSUD dataset and /or enlarge the network. First priority should be given to data derived from research vessels or merchant ships that operate on regular lines.

### 6.2.7 Marine XML

*194* This Agenda Item was introduced by Dr Lesley Rickards on behalf of Dr Roy Lowry, Chair of the Steering Group, referring to Document IOC/IODE-XXI/21 (*Report of the MarineXML Steering Group*). She reported that the joint MarineXML/SeaDataNet vocabulary governance group has been working to develop vocabularies covering water body names and data production tools. The 'SeaVoX Salt and Fresh Water Body Gazetteer' launched just prior to IODE-XX has undergone further population. The 'SeaVoX Device Catalogue has been initially populated and published.

*195* A presentation was given to the ICES Working Group on Data and Information Management (Copenhagen, 25–27 May 2010) on the history and role of the MarineXML SG. This was well received and in the following discussion WG-DIM recognized that standards development was within its strategic Terms of Reference. The WG-DIM co-chairs agreed that they would endeavour to find resources for specific standards development activities brought to their attention and deemed to be of specific interest to ICES.

*196* Dr Rickards then informed the Committee of the proposed work plan and budget for the next inter-sessional period. This will include the continued development of the "SeaVoX Salt and Fresh Water Body Gazetteer".

*197* Dr Rickards noted that there will be no financial requirements for the next inter-sessional period. Dr Rickards also noted that the overlap between the marineXML and Ocean Data Standards Pilot Project is quite substantial and therefore recommended that the marineXML activities should continue as part of the Ocean Data Standards project.

*198* The Co-chair of IODE noted that the name of this Steering Group, in fact, no longer properly described the work that was being done. Many members agreed with the proposal to abolish the group as a formal entity, but noted that the work done was still relevant. It was noted that the ODS-PP was a pilot project with no permanence and no Terms of Reference. The Committee decided that both of these needed attention.

*199* At the same time, the chair of ETDMP reminded the Committee that the work of the ODS was to manage the standards process rather than to develop standards. Such work was more within the remit of the TT-Metadata although some changes to the work statement to this group might be needed.

*200* The Committee was reminded that a number of other groups were working on similar aspects of vocabulary development (GE-BICH, QARTOD, MMI, ICES WG-DIM, SDN) and it would be important to be sure proper liaison and collaboration be established to avoid duplication.

*201* **The Committee urged** national experts to register in the SeaVox mailing list through contacting Dr Lowry.

*202* **The Committee instructed** the chair of ETDMP, working closely with GE-BICH and as appropriate with the above noted groups, to determine the most appropriate mechanism for taking over the work of the SG-XML. This would include preparing Terms of Reference for the Pilot Project, changing the status of the project to a permanent status, and determining which of the ETDMP Task Team for ODS or the ETDMP Task Team for Metadata was the most appropriate group to carry the work forward. It was recalled that the ETDMP is a joint JCOMM/IODE body so decisions should be approved both by JCOMM and IODE. The Committee was informed that the next JCOMM Management Committee is scheduled for September 2011. The conclusions and recommendations by the ETDMP could be considered

by the Management Committee at that time. Consequently, the work described should be completed before September 2011.

*203* **The Committee decided** to abolish the IODE Steering Group for Marine XML.

### 6.2.8 Aquatic Sciences and Fisheries Abstracts (ASFA)

*204* This Agenda Item was introduced by Ms Linda Pikula (Chair GE-MIM), referring to Document IOC/IODE-XXI/22 (*ASFA–Aquatic Sciences and Fisheries Abstracts*). She informed that collaboration between IOC and ASFA is implemented through the work of the GE-MIM. Ms Pikula reported the following achievements during the past inter-sessional period: (i) encouragement of ODIN library managers to increase ASFA input; (ii) participation of the GE-MIM Chair in the 2010 ASFA Advisory Board Meeting (Casablanca, Morocco, 5-9 July 2010). At that occasion the FAO ASFA Secretariat agreed to investigate means to increase ASFA collaboration with, and also ASFA participation in, IOC-IODE/ODIN activities and initiatives (e.g. capacity building in digitization and repositories) and OceanTeacher training activities were discussed; (iii) development of ability of ASFA input software to ingest Inmagic library records (the Inmagic software has been used by ODINAFRICA partner libraries to manage library holdings).

*205* During this meeting retiring ASFA Editor in Chief, Richard Pepe (FAO) was presented with an IODE Achievement Award in recognition of his role in making ASFA a successful and comprehensive bibliographic reference tool of choice for many marine and freshwater researchers. For IODE participation in ASFA as one of the founding organizations was its first activity in the area of marine information management. Today the ASFA database contains more than 1.3 million bibliographic references to the world's aquatic science literature accessioned since 1971.

*206* Ms Pikula then briefly introduced the work plan and budget for the next inter-sessional period: (i) ODIN MIM Coordinators to approach the ASFA Board referring to the substantial archives of grey material available in their libraries. Local experts could visit national institutions with portable equipment to undertake the scanning; (ii) to coordinate with ASFA the possible funding of this digitization effort through ODINCARSA LA; (iii) attention be given to providing training on digitization (and include course material in OceanTeacher). In this regard reference was made to the Courses "Preservation and Archiving of Digital Media", "Digital Asset Management", and "Funding for Digital Projects".

*207* Ms Pikula noted that the only financial requirement would consist of funding for the GE-MIM Chair to attend the 2011 ASFA Advisory Board meeting, tentatively planned to be held in Guayaquil, Ecuador, 5–9 September 2011.

*208* **The Committee approved** the proposed work plan, while referring discussions on financial implications to Agenda Item 13.

### 6.2.9 OceanDocs and Aquatic Commons

*209* This Agenda Item was introduced by Ms Linda Pikula (Chair GE-MIM) referring to Document IOC/IODE-XXI/23 (*OceanDocs and Aquatic Commons*).

*210* Ms Pikula recalled that IODE's OceanDocs was established as a project through Recommendation IODE-XIX.11 and is designed to capture and make freely accessible the research output from members of the IODE Ocean Data and Information Networks (ODINS). It is a thematic digital repository of organization publications, scholarly materials, grey literature and other documents submitted by scientific researchers and librarians. It is an international, multi-institution open-access repository network, focused at present on marine

and oceanographic literature. OceanDocs is available online through http://www.oceandocs.net. In addition to documents submitted by ODINAFRICA (1522) and ODINCARSA LA (1459) also IODE documents (491) have been added. Also GEOHAB (Global Ecology and Oceanography of Harmful Algal Blooms) documents are expected to be uploaded as from 2011 within the framework of the IODE-HAB cooperation through the HAIS (Harmful Algal Information System) [see also Agenda Item 9.1]. Approximately 500 documents are added per year. In 2010 over 403,000 downloads were observed (excluding crawlers).

*211* **The Committee expressed its high appreciation** to UHasselt (Universiteit Hasselt, Belgium) and in particular to Mr Marc Goovaerts, for the considerable in-kind support provided to the OceanDocs project.

*212* In addition to contributing documents through the OceanDocs central repository, several institutions/Member States have established their own repositories (e.g. Russian Federation, Ukraine, India, Fiji, China).

*213* The International Association of Aquatic and Marine Libraries and Information Centres (IAMSLIC) (http://www.iamslic.org) developed a similar system called Aquatic Commons, a thematic digital repository covering the natural marine, estuarine /brackish and fresh water environments. It includes all aspects of the science, technology, management and conservation of these environments, their organisms and resources, and the economic, sociological and legal aspects. As of December 2010, Aquatic Commons contained nearly 4000 records. The total number of document download (August 2009–September 2010) was 93,348.

*214* In December 2010, within the framework of the long-standing collaboration between IAMSLIC and IODE, the IOC Project Office for IODE in Ostend, Belgium agreed to host Aquatic Commons as part of IODE efforts to promote free and open access to marine scientific information to the global community. As part of the agreement the cooperation includes technical support provided by the IODE Project Office. IODE hosting began with implementing EPrints Version 3.2.4 with the official re-launch on 1 January 2011. The Aquatic Commons repository is expected to continue in growth and use. Upgrading and customization of the software will be carried out during the next inter-sessional period. Management for Aquatic Commons is now administered by a joint IODE/IAMSLIC Aquatic Commons Management Board.

*215* Ms Pikula informed the Committee of the emerging cooperation with FAO within the framework of “AgriOcean DSpace”. This is a joint initiative to provide a customized version of DSpace using standards and controlled vocabularies in oceanography, marine science, food, agriculture, development, fisheries, forestry, natural resources and related sciences. The collaboration between FAO and UNESCO-IOC/IODE has the following goals: (i) promoting open access to scientific information on the topics of food, agriculture, development, fisheries, forestry, natural resources and related sciences for FAO and oceanography and marine sciences for UNESCO-IOC/IODE; (ii) ensuring the metadata quality of repositories and the use of thesauri and other forms of authority control; (iii) contributing to the development of sustainable repositories by the use of tools to make scientific publications (and later data) more accessible and visible; (iv) removing access barriers by encouraging the creation of new service providers based on existing and mature metadata and semantics technology. The communities supported by FAO and UNESCO-IOC/IODE are synergistic and the standards on metadata and controlled vocabularies are similar for both. Hasselt University Library will create for FAO and UNESCO-IOC/IODE a new version called AgriOcean DSpace. It will integrate the previous developments of both Agencies in one customized version of DSpace 1.7, using the new features authority control, Solr based statistics and harvesting. The developments of FAO on AGRIS AP and thesaurus integration will complete AgriOcean

DSpace. Finally an easy-to-install Windows-based version of AgriOcean DSpace will be distributed. AgriOcean Dspace will be made available in 2011.

*216* A second undertaking will be the PublishedOceanData initiative (see Agenda Item 6.2.3). This system will utilize DSpace as its main software platform and one of the test sites will be hosted by the IOC Project Office for IODE, Ostend in close collaboration with, and with technical support from Hasselt University (Belgium).

*217* A third undertaking will be the VOA3R project. VOA3R is the innovative research project for digital libraries and stands for: "Virtual Open Access Agriculture & Aquaculture Repository: Sharing Scientific and Scholarly Research related to Agriculture, Food, and Environment". IODE will collaborate in VOA3R through its cooperation with Hasselt University (Belgium). The general objective of the VOA3R project is to improve the spread of European agriculture and aquaculture research results by using an innovative approach to sharing open access research products. This will be achieved by carrying out innovative experiments with open access to scientific agriculture and aquaculture contents and by developing and providing services that integrate existing open access repositories and scholarly publication management systems by means of a federation approach. Under a strict open access policy, the VOA3R service will connect libraries, archives and other publication systems by providing advanced search interfaces that include the specifics aspects of research work (methods, variables, measures, instruments, techniques, etc.) that are specific of the particular domain. The users of the VOA3R service are academics and researchers but also students and practitioners who either want to search for or to publish scientific research results (for these roles, learning material related to the application of scientific outcomes is also considered, as a sub-product of research). The project is targeted to the domain of Agriculture & Aquaculture, as it re-uses previous domain models for these domains, but the technology and models integrated are to a large extent transferable to other academic disciplines.

*218* The VOA3R platform aims at reusing existing and mature metadata and semantics technology to deploy an advanced community-focused integrated service for the retrieval of relevant open content and data that includes explicit models of the scholarly methods and procedures used and of the practical tasks targeted by applied research (which represent a principal information need expression for practitioners). The service will enable researchers to formulate their information needs in terms of elements of the scientific methods established in their field (variables, techniques, assessment methods, kinds of objects of interest, etc.) combined with topical descriptions as expressed in metadata. The community approach will enable the enhancement of information seeking with extended evaluation elements (as for example, ratings, public reviews, social tagging and links to supporting or conflicting reports) that complement and go beyond the traditional, anonymous peer review process which results are not made available openly. The technology used will itself become open source, so that the model of the service can be adopted by enterprises (including SMEs) or other kinds of institutions as a value-added, community-oriented model for open access content.

*219* Ms Pikula informed the Committee about the proposed establishment of an IODE Steering Group for OceanDocs. This Group will advise the Committee on the global policy and strategy of OceanDocs. In addition the Group will work with the IODE/IAMSLIC Aquatic Commons Management Board to maximize interoperability and mirroring of such things as metadata fields and vocabularies and the planning of products and services which utilize the content and functionality of both repositories.

*220* **The Committee recognized** the importance of OceanDocs and **reiterated** its support to its activities.

*221* The delegate from France informed the Committee that France had performed an inventory of publications prepared after French scientific research cruises. The inventory is

available in electronic form, and France is willing to share it with OceanDocs. **The Committee accepted** the kind offer.

*222* **The Committee approved** the OceanDocs work plan, while **referring** discussions on financial implications to Agenda Item 13.

*223* **The Committee adopted** Recommendation IODE-XXI.6 (Establishment of the IODE Steering Group for the OceanDocs Project).

### 6.2.10 OceanExpert

*224* This Agenda Item was introduced by Ms Linda Pikula (Chair GE-MIM) referring to Document IOC/IODE-XXI/24 (*OceanExpert*).

*225* Ms Pikula recalled that OceanExpert is a product developed by GE-MIM in 1997 and continuously refined to advance with new technologies. It is maintained by the IOC Project Office for IODE and contains information on individuals and institutions involved in all aspects of Marine or Freshwater Research and Management worldwide. It is intended to be a tool for scientists, policy makers and anyone who needs to contact a marine or freshwater professional. OceanExpert currently holds information on 13,180 experts and 4,460 institutions (14/2/2011). It also includes job listings, upcoming events, individual scientist's publications listings, and links to the scientists IODE activities. Usage statistics indicate 30,000 uses per month. The URL is: http://oceanexpert.org/. Ms Pikula further noted that OceanExpert is used intensively as the "people database" in most IOC web sites as part of the "PaperClip" software that enables the management of events, event participants and documents.

*226* The OceanExpert development is guided by the IODE GE-MIM. The GE-MIM-XI workplan indicates that a further investigation into the linking of OceanExpert records and publications to the OceanDocs Repository be made. This has been implemented recently. It could therefore be envisaged to utilize OceanExpert as an "authority list" or "vocabulary" for individual expert information, and similarly the institution record in OceanExpert could be utilized as an "authority list" as well. It is noted that other projects such as SeaDataNet use similar concepts for institutions (EDMO: European Directory of Marine Organizations). In this regard GE-MIM is exploring collaboration with the International Association of Marine and Aquatic Science Libraries and Information Centers to establish a controlled list of worldwide marine institutions to be used in OceanExpert. The Committee was invited to consider collaboration with other organizations or projects such as IAMSLIC, SCOR, POGO, European Commission, ICES, etc.

*227* Ms Pikula informed the Committee that no specific budget has been identified for the further development of OceanExpert taking into account that is normal maintenance is covered by IOC and the IOC Project Office for IODE.

*228* **The Committee proposed** that the over 4,000 institutions referred to in the OceanExpert database should be linked to the SeaDataNet EDMO codes.

*229* Ms Pauline Simpson informed the Committee that several initiatives have been initiated to uniquely identify scientific authors. Examples are ResearcherID (developed by Thomson Reuters in 2008), and ORCID (Open Researcher and Contributor ID) which is a proposed non-proprietary alphanumeric code that would uniquely identify scientific and other academic authors. The GE-MIM had started discussions on the use of OceanExpert for this purpose.

*230* **The Committee congratulated** the GE-MIM with the progress made in the further development of OceanExpert and **instructed** the GE-MIM to further investigate the use of OceanExpert as a unique researcher ID server.

### 6.2.11 OpenScienceDirectory

*231* This Agenda Item was introduced by Ms Linda Pikula on behalf of Mr Marc Goovaerts, referring to Document IOC/IODE-XXI/25 (*OpenScienceDirectory 2008–2010*).

*232* Ms Pikula recalled that the idea of the Open Science Directory (http://www.opensciencedirectory.net/) started with a request of IOC/IODE to create a database of all accessible journals in oceanography and marine science. The A-to-Z-list of EBSCO was the perfect tool to organize this collection. It was an easy step to extend this collection to a general directory of journals accessible in developing countries. With the help of EBSCO, it was possible to create the Open Science Directory, which started on February 14, 2008. Access to scientific literature is very important for the scientific work of every scientist but is often extremely difficult to obtain in developing countries. As a result of different projects a large collection of e-journals is now available for researchers in developing countries. The number of Open Access Journals is growing steadily as we can see in the Directory of Open Access Journals. Major UN organizations like WHO, FAO and UNEP have their specific programmes for the scientific institutions in low-income countries: HINARI, AGORA, OARE. Finally a lot of universities, institutes and publishers have access to support programmes. The most important are INASP-PERii, eIFL, Highwire, JSTOR's Developing Nations Access Initiative and eJDS. All these programmes and projects have their own website and/or search engine. IOC/IODE and Hasselt University Library, with the support of EBSCO, is creating a single access point to all the journals contained in the different programmes: The Open Science Directory – www.opensciencedirectory.org. The directory now contains over 20,000 journals with the aim to reach 25,000. From about 26,000 the number of visitor sessions has increased to over 279,000 in 2010.

*233* Ms Pikula then informed the Committee of the work plan for the next inter-sessional period. The first goal now is to complete the collection with the major collections of INASP-PERii and JSTOR's Developing Nations Access. Then, we will try to enhance the service, by negotiating the accessibility of the different journals. Now we have to send the user to the portal of the different projects, where they have to do the query again. With direct links through their proxy server, which guarantees the authentication and identification of the user (important for the publisher), it could be possible to access directly the journal with one search, but still with an authentication. Also we could use the Open Science Directory as a link resolver, adding it for example to Google Scholar. Therefore we will negotiate with HINARI, AGORA en OARE to enhance the accessibility to their collection and then install the link resolver functionality. These realizations are only possible thanks to good cooperation between EBSCO, IOC and Hasselt University. Partners use their technical capacities and contacts to ameliorate the Open Science Directory.

*234* Ms Pikula informed the Committee that no financial support is required for the further development of the OpenScienceDirectory.

*235* **The Committee expressed its appreciation** to EBSCO and Hasselt University and **urged** them to continue this valuable product, which provides essential services to scientists in developing countries.

## 7. IODE CAPACITY BUILDING

### 7.1 OCEANTEACHER AND TRAINING ACTIVITIES

*236* This Agenda Item was introduced by Mr Greg Reed and Ms Linda Pikula referring to Document IOC/IODE-XXI/26 (*OceanTeacher and Training activities*).

*237* The Committee was reminded that OceanTeacher is the cornerstone of the IODE capacity building programme and supports all IODE training activities by providing training tools for data and information management. Training is complemented and supported by the OceanTeacher training system. The OceanTeacher Academy (OTA), which offers a teaching programme of courses related to oceanographic data and information management and the development of related products and services, commenced its first academic year in 2009-2010.

*238* During the inter-sessional period (May 2009–February 2011) a total of 15 data management and 10 marine information management courses were organized. Although most of the courses have been organized at the IOC Project Office for IODE in Ostend, an increasing number are now hosted by Member States.

*239* During the next inter-sessional period approximately12 courses (6 data management, 6 information management) courses will be organized.

*240* It was recalled that funding for the courses is sourced mainly from the OceanTeacher Academy project (funded by the Government of Flanders through the UNESCO FUST programme) and the direct funding contributed by the Government of Flanders to the IOC Project Office for IODE (through the Flanders Marine Institute). However the Committee was informed that increasingly partnerships have been established between IODE and other programmes or organizations (e.g. IOC ICAM, EUMETSAT, NOAA, WMO, JCOMM) that enable the pooling of resources.

*241* The Committee was reminded that Ocean Teacher is maintained by a small core of data and information management specialists. To ensure its continued success, Member States are urged to contribute to OceanTeacher, through the provision of content to the Digital Library, the provision of training material and course development for the Classroom, or participating as instructors at OTA courses.

*242* **The Committee recognized** the importance of OceanTeacher as the main capacity building tool of IOC/IODE and **endorsed** its activities.

*243* **The Committee remarked** the need for more Member States to contribute to OceanTeacher, namely as content providers, and **asked** for clarification on guidelines on how to provide those contributions. The Committee was informed about the binary structure of Ocean Teacher, consisting of the wiki-style Digital Library and the Moodle software-based Classroom. Content providers are attributed personal passwords per request to the OceanTeacher administrator in order to be able to upload contents as needed.

*244* **The Committee recognized** the importance of the already existing training materials produced by SeaDataNet and **invited** SeaDataNet to work with the IODE Project Office to ensure these are entered in OceanTeacher.

*245* **The Committee also remarked** that training materials from other projects (e.g. Black Sea Scene, Cruise Summary Reports, and other ODIN regional training documents), when available, should also be provided to OceanTeacher.

*246* The representative from EUMETSAT informed the Committee about the COMET training site and invited IODE to also make use of this resource.

*247* **The Committee recognized** that internet connectivity and bandwidth problems persist in some countries, which hinders access to OceanTeacher content. **The Committee instructed** the Steering Group for OceanTeacher to investigate possibilities for making the digital library and/or the classroom available in offline version.

*248* **The Committee**, taking into account the needs of start-up data and information centres, **instructed** the Steering Group for OceanTeacher to consider developing case-study materials as well as step-by-step training materials (e.g. for the setting up of databases).

## 7.2 IODE'S REGIONAL CAPACITY BUILDING PROJECTS: ODIN

### 7.2.1 Ocean Data and Information Network for Africa (ODINAFRICA)

*249* Mr Odido introduced this Agenda Item by referring to Document IOC/IODE-XXI/27 (*ODINAFRICA Progress Report*). The implementation of the fourth phase of ODINAFRICA-IV begun at a slow pace in 2009, but has now picked up. Assessments of capacities for implementation of planned activities had been undertaken through questionnaires, assessment missions, and national and regional assessment meetings. Partnership Agreements had been processed and funds provided to institutions in 17 participating countries to enable them organize national Coordination meetings to identify priority issues to be addressed in ODINAFRICA-IV, embark on development of national coastal and marine atlases, and update the products and services developed in the earlier phases.

*250* Experts from ODINAFRICA-IV institutions participated in OceanTeacher Academy training courses to improve their skills in various aspects of marine data and information management. Good progress was made in the development of the Coastal and Marine Atlases, with four training courses held in May 2010 (Ostend, Belgium), July/August 2010 (Mombasa, Kenya), November 2010 (Ostend, Belgium) and February 2011 (Ostend, Belgium). National Atlas teams were established in most of the countries and data mining and processing begun in earnest. An ODINAFRICA Marine Information Management Planning workshop was held in Dakar, Senegal from 29 November–2 December 2010 to agree on the Library Management software to use, and finalize work plan for information management activities in the current phase of ODINAFRICA. The work on the development of the African Register of Marine Species will commence in 2011, with support from OBIS. Collaboration with various projects and organizations in Africa was developed and/or strengthened. These include the four LME projects (ASCLME, BCLME, CCLME and GCLME), the Western Indian Ocean Marine Sciences Association, and UNEP.

*251* The ODINAFRICA Steering Committee identified the following broad areas to focus on during each year of implementation of ODINAFRICA-IV:

- 2009: National Assessments and putting in place management structures at the Regional level
- 2010: Finalization of National Assessments, Identification of priority issues to address, Data Mining and commence development of National Marine Atlases
- 2011: Completion of National Marine Atlases, commencement of work on regional atlases and national ocean data portals. Training on information management, focusing on library software. Migration from of library databases from INMAGIC to ABCD and AgrOcean/DSpace. Training on communication and outreach skills. Update and maintenance of other project databases and services.

- 2012: Completion of regional atlases and national ocean data portals, development of scenarios and forecasts and incorporating them in the marine atlases. Completion of library databases, update of experts, institutions and databases as well as the marine biodiversity databases
- 2013: Development of regional ocean data portals, publication of the African Marine Atlas book, finalization of ODINAFRICA-IV

*252* The implementation of activities related to development of scenarios, forecasts and predictions, as well as "outreach and communications tools" will require skills that the ODINAFRICA NODC's do not have at present. The project looks forward to collaboration with other NODCs that have experience in these fields.

*253* The ODINCARSA-LA Coordinator informed the Committee that he will explore the possibility of institutions from his region providing the expertise required by ODINAFRICA for development of scenarios, forecasts and predictions, as well as "outreach and communication tools".

*254* **The Committee commended** ODINAFRICA on their accomplishments and **encouraged** the Member States to explore the possibility of providing the expertise required.

*255* The Committee was informed that ODINAFRICA will be holding a Symposium on the Contribution of Ocean Data and Information Management to Sustainable Development, 4–6 October 2011, Saly, Senegal. **The Committee urged** ODINAFRICA participating countries as well as other IOC Member States to participate actively in the event.

### 7.2.2 Ocean Data and Information Network for the Caribbean and South America regions (ODINCARSA)

*256* This Agenda Item was introduced by Mr Ariel Troisi and Mr Ramon Roach, referring to Document IOC/IODE-XXI/28 (*Ocean Data and Information Network for the Caribbean and Latin America – ODINCARSA-LA*).

*257* Mr Troisi recalled the achievements and shortcomings since the inception of ODINCARSA in October 2001 and, in particular, the decisions and results of the activities during the inter-sessional period.

*258* On 7–10 December 2009, an ODINCARSA Planning Meeting was held at the Instituto de Investigaciones Oceanológicas (IIO) of the Universidad Autónoma de Baja California with representatives from nine Member States. At the meeting the status of ODINCARSA, data and information management capacity, needs and requirements were assessed, the main goals and objectives were revisited and reviewed and an implementation plan was discussed and agreed upon. It was further decided to designate two Regional Coordinators, one for data management and another for marine information management (Mr Ariel Troisi and Ms Andrea Cristiani), and rename the network ODINCARSA-LA.

*259* During the present inter-sessional period, 29 trainees participated in Data Management capacity enhancement activities and 16 in Marine Information Management. Two expert visits were carried out to Member States and additional support was provided via electronic means to several NODCs. Additionally the IODE OceanDataPortal was promoted in the region. ODINCARSA-LA also had an active participation in the 3rd SPINCAM Project Steering Group Meeting through the participation of Mr Ariel Troisi.

*260* Further regarding Marine Information Management Mr Troisi informed the Committee that Ms Cristiani attended GE-MIM-XI (May 2010). An OceanDocs Latin America meeting

was held 16–17 October 2010 in Mar del Plata, Argentina prior to the 36th IAMSLIC Conference.

*261* ODINCARSA-LA contributed to improving the generation and provision of ocean data and information products and services to different users by sharing expertise, knowledge transference and capacity enhancement.

*262* Mr Troisi called the attention of the Committee to important challenges remaining in the region such as the development of partnerships, close interaction with OBIS as well as with different IOC Programmes and other relevant organizations.

*263* The first Planning and Review workshop for the development of the Caribbean Marine Atlas (CMA) was held in Castries, Saint Lucia from 2–5 August 2010. The workshop brought together nearly all of the regional experts who have been involved in training activities from the inception of the CMA project as well as potential new members from Cayman Islands. The following were achieved during the workshop: (i) review of the progress of the CMA and a demonstration of the atlas prototype; (ii) better understanding of the challenges, benefits and goals of web atlases and environmental data dissemination platforms; (iii) identification of the necessary inputs (area of focus, data partners, themes, functionality); (iv) determination of the steps required to implement a national atlas (workplan) and development of a tentative timeline. Participants were challenged to remain committed to the project and urged to be deeply involved in the next phase of the CMA, which would include the further development and publishing of the regional atlas, and the development of national atlases within the partner countries.

*264* Mr Troisi then informed the Committee of the proposed work plan and budget for the next inter-sessional period. In the area of data management this will include: (i) establish and support new NODCs and continue supporting those existing; (ii) designate/update IODE national coordinators for data management; (iii) improve capabilities to access and use real time and near-real time data to generate products and provide services; (iv) Development of a regional metadata base and query application; (v) improve IODE NODC-OBIS interaction at the national and regional level; (vi) development the regional atlas application for the CMA; (vii) develop national atlases within participating CMA countries. In the area of marine information management (MIM) the focus will be on the OceanDocs graphic user interface and Serial Latin-American Publications in Marine Science, Aquatics and Fisheries.

*265* **The Committee commended** ODINCARSA for developing a work plan that included performance indicators and **requested** that all the ODIN's prepare similar work plans for future sessions of the Committee. Reports submitted should also indicate how the indicators have changed during the reporting period. **The Committee noted** that the ODINCARSA Marine Information Management has done a good job in populating OceanDocs.

*266* **The Committee approved** the ODINCARSA work plan, while **referring** discussions on the financial implications to Agenda Item 13.

### 7.2.3 Ocean Data and Information Network for the Central Indian Ocean Region (ODINCINDIO)

*267* This Agenda Item was introduced by Mr Mika Odido, IODE regional programme coordinator. He recalled that the Committee, at its 20th Session, had instructed the Secretariat to follow-up with communications to IODE and IOC national contacts in the region, as well as to organize a meeting for Member States from the region during the 25th Session of the IOC Assembly (June 2009). A meeting of IOCINDIO Member States was called together during the 25th Session of IOC Assembly. There the Secretariat was requested to send

communications to all IOC national contacts in the region to commence communication and revitalization of IOCINDIO and ODINCINDIO.

*268* **The Committee noted** the efforts that have been made by the Secretariat to contact national focal points and IOC Action addressees in the region, but **regretted** that only a few responses were received.

*269* The delegates of India and Thailand confirmed their willingness to support any activities to revive ODINCINDIO, including the organization of a meeting of representatives from the region during the 26th session of the IOC Assembly. **The Committee instructed the Secretariat** to make the arrangements for this meeting.

*270* **The Committee designated** India as the Interim Coordinator for ODINCINDIO.

*271* **The Committee noted** that the INCOIS proposal for a regional training centre for operational oceanography could provide the impetus required for re-activation of ODINCINDIO.

### 7.2.4 Ocean Data and Information Network for European Countries in Economic Transition (ODINECET)

*272* This Agenda Item was introduced by Ms Olga Akimova (ODINECET regional coordinator) referring to Document IOC/IODE-XXI/30 (*Ocean Data and Information Network for the European Countries in Economic Transition – ODINECET*).

*273* Ms Akimova reported on progress made in the implementation of the ODINECET work plan during the inter-sessional period. This includes (i) a three-day ODINECET review and planning meeting was held in Ostend; (ii) 15 students from the region participated in OceanTeacher Academy courses in 2010; (iii) E-repositories were created and/or updated: IBSS, CEEMaR and new input centres were identified; (iv) A Koha e-catalogue pilot was started at IBSS; (v) a Union catalogue system, using the IMIS software developed by the Flanders Marine Institute was implemented involving 22 marine libraries in the region; (vi) an equipment grant was provided by IODE to institutions in the region; (vii) cooperation with the ODIN-BlackSea project is being discussed; and (viii) ASFA input centres from the ODINECET group provide links full-text documents from CEEMaR and IBSS repositories in ASFA records.

*274* Ms Akimova then introduced the ODINECET work plan and budget for the next inter-sessional period. The proposed work plan will include (i) updating of the ODINECET web site; (ii) participation in OceanTeacher training courses; (iii) organization of ODINECET coordination meeting in 2011, 2012 and 2013; (iv) Continue submission of documents into CEEMaR and IBSS repositories; (v) providing technical and equipment support to CEEMaR partners; (vi) organizing a meeting of Russian aquatic libraries and information centres staff at VNIRO, Moscow; (vii) installation of Koha software in ODINECET partner institutions; (viii) updating of the ECET Union catalogue including foreign titles stored in ODINECET partner libraries; (ix) digitization of rare monographs related to marine sciences held by ODINECET partner libraries.

*275* The ODINBLACKSEA Coordinator, Dr Vladymyrov reminded the Committee that there are two ODIN networks in the Black Sea region: ODINECET, which was the first to be established, focuses on information management, while ODINBlackSea focuses on data management. The two work closely together, with the ODINBlackSea providing support in developing products such as the e-repository, while ODINECET assists in tracking data sets.

*276* **The Committee welcomed** the collaboration between ODINECET and ODINBlackSea, and **commended** ODINECET for the progress they have made in turning what they have learnt into practice by developing new products such as e-repositories.

*277* **The Committee approved** the ODINECET work plan, while **referring** discussions on the financial implications to Agenda Item 13.

### 7.2.5 Ocean Data and Information Network for the Western Pacific region (ODINWESTPAC)

*278* This Agenda Item was introduced by Prof. Shaohua Lin (ODINWESTPAC regional coordinator), referring to Document IOC/IODE-XXI/31 (*Ocean Data and Information Network for the Western Pacific region (ODINWESTPAC)*).

*279* Prof. Lin reported to the Committee that China has continued to coordinate ODINWESTPAC since WESTPAC-VII held in Malaysia in May 2008. She then reported on the activities undertaken during the inter-sessional period: (i) collection of information on ODINWESTPAC contact points in 15 Member States (Australia, Cambodia, China, Fiji, France, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Russian Federation, Thailand, United Kingdom, United States and Vietnam); (ii) establishment of three working groups at NMDIS to support ODINWESTPAC (external contact and training group, information group, data group); (iii) procurement of equipment for, and creation of the ODINWESTPAC web site by NMDIS; (iv) development of data services including Chinese coastal station data, other regional and international cooperation programme and project data, marine data products; (v) cooperation with NEAR-GOOS and SEAGOOS has been discussed; (vi) cooperation with IODE ODP by installing the data provider on the ODINWESTPAC server.

*280* Prof. Lin reported that most proposed activities are progressing slowly due to limited interest shown by the Member States. In addition Member States are slow to provide data to be made available through the ODINWESTPAC web site. Additional training also needs to be provided.

*281* **The Committee noted** that it has been difficult to implement marine information management in the region since few Member States have designated MIM coordinators.

*282* Prof Lin reported on the meeting of the sessional Working Group on ODINWESTPAC held during IODE-XXI. Representatives of 11 Member States attended the meeting.

*283* **The Committee approved** a work plan to accelerate the development of ODINWESTPAC with the following elements: (i) re-confirmation of the national focal points for data and information management. **The Committee requested** the IODE Project Office and the secretariat for the IOC's Sub Commission for WESTPAC to assist in getting the Member States from the region to identify/confirm the national focal points for data and information management to reconstitute the coordination working group for the ODINWESTPAC; (ii) Survey on training requirements for the region, and availability of trainers from the region and the topics that they are able to cover; (iii) organization of ODINWESTPAC Coordination working group meeting, to be hosted by China in August 2011; (iv) organization of training course(s) based on regional requirements, as identified during the survey, and approved by the ODINWESTPAC regional coordination meeting; (v) training on Ocean Data portal, and support for the development of ODP nodes in the region; (vi) organization of the second regional coordination working group meeting in 2012.

*284* **The Committee approved** the ODINWESTPAC work plan for the inter-sessional period, while **referring** discussions on the financial implication to Agenda Item 13.

### 7.2.6 Ocean Data and Information Network for the Black Sea Region – ODINBlackSea

*285* Dr V. Vladymyrov introduced this Agenda Item by referring to Document IOC/IODE-XXI/32 (*Ocean Data and Information Network for the Black Sea Region (ODINBLACKSEA)*).

*286* He reminded the Committee that the Ocean Data and Information Network for the Black Sea (ODINBlackSea) Pilot Project was established formally during the Nineteenth Session of the IODE Committee (Trieste, Italy, March 2007) through the Recommendation IODE-XIX.10. All riparian Black Sea countries are participants of the project.

*287* Dr Vladymrov outlined the activities that had been planned for 2009 – 2011, giving details of what had been implemented: (i) A preliminary review presenting the results of analysis of the structure and State of the Black Sea Region National Oceanographic Data Centres was done, (ii) the ODINBlackSea project website was developed in order to assist the coordination of project activities, as well as to create awareness and to promote the project, (iii) the application of the E2EDM technology to integrate the non-homogeneous local data systems into unified distributed marine data system that will provide the transparent exchange between these local systems is ongoing, (iv) organization of working collaboration with the ODINECET IODE Project was done, (v) additional E2EDM training courses (Obninsk, Russia, March 2009 and Istanbul, Turkey, December 2009) were organized.

*288* He reported that the ODINBlackSea Project Steering Committee noted the significant progress that has been made in implementation of activities since March 2009 and the ODINBlackSea Steering Committee agreed that ODINBlackSea will continue working with the objectives defined at its inception in 2007.

*289* Dr Vladymyrov then informed the Committee of the proposed work plan for the next inter-sessional period: (i) updating of the ODINBlackSea web site; (ii) strengthening of ODINBlackSea partner cooperation in IODE ODP; (iii) organization of ODINBlackSea Steering Group meetings in 2011, 2012 and 2013; (iv) review and analyze the structure and State of the Black Sea Region National Oceanographic Data Centres and their web sites.

*290* **The Committee congratulated** Dr Vladymyrov on his efforts that have resulted in the re-activation of the ODINBlack Sea. **The Committee stressed** the need to ensure that the ODINBlack Sea products can be accessed through the ODINBlackSea website.

*291* **The Committee approved** the work plan while referring discussions on financial implications to Agenda Item 13.

### 7.2.7 Regional Network of Pacific Marine Libraries (ODIN-PIMRIS)

*292* Ms Susana Macanawai, the ODIN-PIMRIS Project Coordinator introduced this Agenda Item, referring to Document IOC/IODE-XXI/33 (*Ocean Data and Information Network for the Pacific Islands Region (ODIN-PIMRIS)*).

*293* She recalled that the ODIN-PIMRIS project was established in 2008 but formally during the Twentieth Session of the IODE Committee (Beijing, China May 2009). The ODIN-PIMRIS project combines existing information sources developed by Pacific regional and international agencies such as the Secretariat of the Pacific Community (SPC), Forum Fisheries Agency (FFA), South Pacific Regional and Environmental Programme (SPREP) and the South Pacific Applied Geoscience Commission (SOPAC). Maria Kalenchits, the founding coordinator of ODIN-PIMRIS resigned from her position and left the University of the South Pacific in April 2010 with her replacement, Susana Macanawai taking up office and coordination of ODIN-PIMRIS in November 2010.

*294* She informed the Committee that the first phase of the ODIN-PIMRIS pilot project can be considered successful as the main objectives of the project were achieved through the creation of the Pacific Islands Marine Portal – http://www.pimrisportal.org , establishment of national fisheries/marine e-repositories in selected Pacific Island countries (Cook Islands, Kiribati, Samoa and Solomon Islands), national and regional awareness and promotional activities undertaken and several skills training and advisory expert visits were conducted.

*295* Ms Macanawai further informed the Committee that the University Librarian (Sin Joan Yee) had temporarily taken over the management of the project from April 2010 (when Maria Kalenchits left) and was unable to implement planned activities of 2010 (Phase II) due to very demanding and tight pre-planned work schedules in addition to delays within the University's appointment process. Therefore, project activities of Phase I (2008–2009) will be reviewed in May 2011 and planned activities for 2010 will now be implemented in 2011.

*296* These activities include (i) the regional review meeting for Phase I (2008–2009), (ii) e-repository training for Phase II countries, (iii) country visits and technical support to Phase II countries, (iv) the establishment of a scholarship scheme (Certificate level) to support library/information skills development, and (v) plans for a possible digitization project for all Pacific Island countries participating in the ODIN-PIMRIS project.

*297* **The Committee congratulated** Ms Macanawai on her appointment as the Coordinator for ODIN-PIMRIS, and **conveyed its appreciation** to Ms Maria Kalenchits for her efforts in developing ODIN-PIMRIS into an active network providing services to the institutions in the Pacific Islands. Ms Macanawai informed the Committee that ODIN-PIMRIS will continue its current focus on marine information management.

*298* The Chair of GE-MIM informed the Committee that the Group of Experts would extend support to ODIN-PIMRIS and endeavour to assist in mentoring and training.

*299* **The Committee approved** the planned organization of a regional coordination meeting to review the progress in implementation of activities in the region, and **agreed** on a work plan for the coming inter-sessional period, while **referring** discussions on financial implications to Agenda Item 13.

## 7.3 EMERGING NEEDS IN CAPACITY BUILDING

*300* This Agenda Item was introduced by Mr Greg Reed (IODE Co-Chair). He informed the Committee that the purpose of this Agenda Item was to identify emerging areas in the field of oceanographic data management and marine information management (e.g. related to new user service requirements, new data types, etc) that require training or other capacity development.

*301* It was recalled that there was a presentation on Marine Spatial Planning (MSP) during the IODE 50th anniversary international conference (21–22 March 2011). A course on MSP will be organized at the IOC Project Office for IODE in May 2011. This course may be repeated and may then benefit a wider audience within the IODE community.

### 7.3.1 Proposal to establish an International Training Centre for Operational Oceanography (ITCOocean)

*302* Mr Reed then invited Dr Pattabhi Rama Rao (INCOIS, India) to introduce Document IOC/IODE-XX1/45 (Proposal to establish an International Training Centre for Operational Oceanography (ITCOocean))**.**

*303* Dr Pattabhi Rama Rao recalled "The Ocean Call" at the 43rd meeting of the IOC Executive Council of UNESCO, Paris, during 8–16 June 2010 (IOC/EC-XLI/3 Annex IX), where the IOC Member States were urged to finance and undertake capacity building programmes with an increased priority in programmes in coastal and ocean management, ocean sciences and ocean technologies that will provide safe, healthy and sustainable environments and reduce poverty through the promotion of effective and efficient marine stewardship.

*304* He noted that currently there is no training centre offering training in operational oceanography that can prepare the marine scientists to meet the challenges of nowcasting and forecasting the seas for better resource management, this gap being emphasized in Africa or in the Indian Ocean rim.

*305* He informed the Committee about India's proposal to set up a permanent training facility for capacity building for 'operational oceanography' at INCOIS (Hyderabad, India) in continuation to the statement of Indian delegation at 43rd meeting of IOC (IOC/EC-XLI/3 Annex IX).

*306* INCOIS (Indian National Centre for Ocean Information Services) is the only centre for operational oceanography located in the Indian Ocean region. It is an autonomous body under the Ministry of Earth Sciences from the Government of India. INCOIS also acts as the National Oceanographic Data Centre (NODC) within IODE.

*307* The proposed training in operational oceanography mainly envisages the capacity development on how to make measurements using in situ and satellite platforms, how to obtain real time data, how to process and use the data in modelling, how to make the nowcasts and forecasts and how to disseminate them to the end users at shortest possible time.

*308* Dr Pattabhi Rama Rao recalled the growing capacity of India in oceanographic research, namely its expertise in the fields of multi-disciplinary ocean science, remote sensing, observational networks, mathematical modelling, all of them an asset serving the crucial requirements of a training centre in operational oceanography. Moreover, as part of it international commitment, INCOIS has already organized over a dozen training programmes either on its own or in collaboration with other entities (e.g. IOC, POGO).

*309* The proposed Training Centre, while legally an Indian facility, will operate under the IOC umbrella, and as a contribution from India to the capacity building goals of IOC, and will cooperate closely with IODE and specifically the IOC Project Office for IODE. This will include the use by the Training Centre of the IODE OceanTeacher websites for content management, the joint organization of training events by exchange of lecturers, the use of tele-presence and video conferencing technology-based lectures, etc.

*310* The Training Centre activities will target both established professionals and students, and will offer a range of courses, from Short Term to Long Term Courses. The Long term Courses will range from Background Core Courses to Operational or Optional Courses. The Training Centre will seek collaborations with recognized Universities in order to design the long-term courses and for accreditation purposes.

*311* The Government of India, through it Ministry of Earth Sciences (MoES), will establish the Training Centre in Hyderabad, including the operational/running costs after its settling. An approximate budget of Rs. 1500 million (approx. US$ 33.34 million) will be considered by MoES over a five-year period to build the necessary infrastructure, its maintenance, salaries and travel costs of guest faculty and trainees/students from India.

*312* The remaining costs (trainers' costs and trainees sponsoring, etc.) will need to be provided by IOC and interested Member States or be sourced from IOC extra-budgetary contributions or other international organizations and foundations.

*313* Although the completion of the whole infrastructure is expected to take approximately three years since final approval, the capacity building activities (short term courses) can start within 8-10 months after the final approval, taking advantage of the already existing infrastructures, and currently being upgraded.

*314* **The Committee expressed its appreciation** to India through INCOIS/MoES for its offer to establish a permanent training centre in Hyderabad and stated its strong support to this initiative.

*315* The delegate from France offered support and willingness to collaborate, since it already possesses know-how in the field of operational oceanography. This collaboration can be in the form of training materials as well as sending trainers occasionally.

*316* Mr Peter Pissierssens described the excellent facilities (infrastructures, etc.) offered by India that he had the opportunity to visit recently, and took the opportunity to highlight the need for the establishment of more training centres in addition to those at the Project Office in Ostend.

*317* All ODIN coordinators expressed their strong support for the proposal.

*318* The representative of EUMETSAT also endorsed this initiative and offered the possibility for cooperation.

*319* **The Committee strongly welcomed** the initiative of India and **called** on the Assembly to accept the offer, **stressing** that the proposed Centre complies with the IOC Capacity Development Strategy which focuses on self-driven initiatives, and that the Centre will contribute substantially to the region's capacity in operational oceanography and related data and information management. **The Committee further welcomed** the proposed close collaboration between the Centre and IODE's OceanTeacher.

### 7.3.2 Emerging needs in Capacity Building

*320* The Sessional Working Group on Capacity Building met on Wednesday 23 and Thursday 24 March. The Group elected Mr Ramon Roach (Barbados) as its Chair.

*321* Mr Roach reported that it was noted that through OceanTeacher, the IODE would be hosting 7 training sessions in 2011, apart from regional training activities. It was noted also that the 2nd Session of the IODE Steering Group for OceanTeacher will be held in Miami, USA between 11 and 15 April 2011. This meeting would not deal with course planning but with assessing the pedagogical methodology used by OceanTeacher and planning of technical developments of OceanTeacher.

*322* It was noted that in the past a "top-down" approach to identifying training courses was used, i.e. the nomination of training courses by the user community (e.g. national IODE officers) from a list of possible topics supplied by the IODE. Recently, a "bottom-up" approach was tested, meaning that the community of course attendees/students was asked to identify training needs via survey and that training courses would then be structured around priority needs.

*323* The group noted that through the survey mechanism, the IODE has received requests for training in a number of emerging and traditional fields such as marine spatial planning,

disaster planning for information management systems, marine GIS, data quality control and data archaeology; and that the feasibility of implementing courses to address these and other topics is being considered by the IODE.

*324* **The Committee decided** that:

(i) both the top-down and the bottom-up approach should be continued;

(ii) that surveys to ascertain training needs be conducted prior to the IODE committee meetings and these surveys be incorporated in the national surveys prepared prior to IODE Committee Sessions, and that the results be presented at the IODE Committee Sessions;

(iii) that the surveys should be organized in October/November to allow time for any required national consultation on the requested information;

*325* **The Committee further instructed** the Secretariat to undertake a survey of potential clients of the training courses to find out their numbers (and demography) and what percentage has benefited from the training.

*326* **The Committee further identified** the need for preparing a long term (5 years) training plan and **tasked** the IODE Steering Group for OceanTeacher to carry out this work.

*327* The representative from EUMETSAT noted the usefulness and high-quality of the IOC manual on remote sensing available through OceanTeacher, but noted that portions of the document required updating. This sparked a discussion on the necessity of updating and completeness of several IOC/IODE documents with regard to topics such as the establishment of NODCs and the manual for Marine Information Centres. Brazil suggested the wiki technology for the coordinated, well moderated, group editing of existing IOC manuals/documents, possibly under the umbrella of the OceanTeacher wiki (mediaWiki) system. Expert groups in the different areas (WMO/JCOMM, IODE expert group on NODCs, GE-MIM) would edit the documents in a structured manner and ensure the manuals were as up to date as possible. Furthermore it was suggested that in the next revision of the IOC Manuals and Guides No. 5, best practice guidelines be included for specific NODC functions (database management, data presentation, and case studies of how some of the NODCs were established etc.).

*328* **The Committee recommended** that key operational manuals focused on capacity building and hosted by the IOC/IODE should be updated using the best technological method available (possibly wiki technology), within a committee-led editing and review structure and expanded to include best practice guidelines and case studies.

## 7.4 IODE ACTIVITIES IN THE IOC CAPACITY DEVELOPMENT FRAMEWORK (AND ROLE OF THE IOC PROJECT OFFICE FOR IODE)

*329* This Agenda Item was introduced by Mr Greg Reed. He informed the Committee that, as mentioned under agenda item 7.1 the IODE Secretariat has made active invitations to invite other IOC programmes to utilize the ODIN platforms as IOC-wide capacity development frameworks, to jointly organize training courses, e.g. at the IOC Project Office for IODE, Ostend, and to utilize the OceanTeacher software platform to manage training content.

*330* These invitations have been responded to positively by IOC/HAB, IOC/MSP (Marine Spatial Planning) and IOC/Tsunami. In February 2011 a two-day workshop was organized with the IOC/MSP team to provide hands-on training in the OceanTeacher software platform. A similar workshop will be organized in April for the tsunami team. Furthermore one or two MSP training courses will be organized in 2011 at the IOC Project Office for IODE.

*331* Cooperation between IODE/ODINs and other IOC programmes has met with less success. Cooperation between ODINAFRICA and GOOS Africa has been minimal (except for cooperation with GLOSS Africa).

*332* The Committee was also reminded that one of the objectives of the OceanTeacher project is to assist regions with the establishment of regional training centres. These centres could be focused on IODE but also on other IOC programmes. OceanTeacher could assist these emerging centres with its OceanTeacher software platforms as well as with organizational assistance. In this regard it will be noted that the "Regional Training and Research Centre on Ocean Dynamics and Climate (hereinafter referred to as "ODC Centre")" has been established in the First Institute of Oceanography, State Oceanic Administration of China. As per the Agreement signed by both parties, "the objectives of the Centre shall be to enhance the regional research capacity and capability on ocean dynamics, air-sea interactions, climate change and numerical modelling through, among others, provisions of regular training courses in English once a year to around 15-20 junior scientists and doctoral/master students mainly from the developing Member States of IOC in the Western Pacific". A first course is planned to take place 16–20 June 2011. So far no cooperation has been established between the IOC Project Office for IODE (an invitation was sent to the WESTPAC Secretariat in Bangkok in February 2011). IOC Regional Subsidiary Bodies and ODINs may wish to consider the establishment of regional training centres in close collaboration with OceanTeacher.

*333* The Committee was further informed that Dr Ehrlich Desa, Deputy Executive Secretary and responsible for the IOC Capacity Development programme had retired in December 2010.

*334* China informed the Committee that a MoU had been signed between China and the International Ocean Institute (IOI) to establish an IOI operational centre which would organize training courses. China offered to also establish an IODE regional training centre and to promote cooperation between the two centres. The Technical Secretary offered to help with all the procedures needed.

*335* **The Committee expressed its appreciation** for the offer by China and **instructed** the Secretariat to discuss this matter further and to make the necessary arrangements to facilitate the establishment of the training centre.

## 8. ORGANIZATIONAL REFORM ISSUES

### 8.1 REPORT ON THE FOLLOW-UP TO THE IODE REVIEW

*336* This Agenda Item was introduced by Dr Malika Bel Hassen (IODE Co-Chair). She recalled that an external evaluation of the IODE was conducted by UNESCO´s Internal Oversight Service Unit (IOS) in 2007. The evaluation process identified the strengths and weaknesses of the IODE programme and presented 12 recommendations. The IODE officers have responded to these recommendations in their meeting in 2008. Dr Bel Hassen summarized the recommendations that needed to be revisited and clarified:

*337* *Recommendation 1. IODE should consider establishing an inter-session working group to assess and recommend approaches to address the issue of lack of awareness by the ocean sciences community with respect to the capacities of IODE already in place in terms of data management.* The IODE officers suggested that the IOC Strategic Plan for Oceanographic Data and Information Management will raise awareness for IODE and should attract new user communities. The OceanDataPortal should increase visibility of, and appreciation for IODE. Little communication was noted between members of the Advisory group on the IOC Strategic Plan for Oceanographic Data and Information Management.

Although progress was recorded during the inter-sessional period in the contribution to ODP, there was still an imbalance between contributions of regions and programmes. There is a further need to revise mechanisms to address the issue of lack of awareness by the ocean sciences community with regard to the capacities of IODE in terms of data management.

*338* **The Committee recalled** that Mr Robert Keeley had been a member of the OOPC. In this capacity he was able to provide a report on IODE to leading experts in ocean science. **The Committee requested** the IODE Co-Chairs to contact Dr Albert Fischer at the IOC Secretariat to inquire if another data management expert from IODE would be considered for an invitation to the next OOPC meeting.

*339* Following the example of IPY and SCAR**, the Committee recommended** that papers should be presented at scientific conferences describing where data are archived and how they are available through the IODE system.

*340* **The Committee recommended** that papers on IODE be submitted for the IPY and SCAR conferences planned for 2011.

*341* *Recommendation 2. Considering the use that Atlases, such as the African Atlas of the Ocean, can have with respect to the planning and utilization of resources in coastal areas in the context of integrated environment management; the IODE Committee should assess how best to transfer the lessons learned from the approach coordinated by ODINAFRICA to ODINCARSA, ODINCINDIO, ODINWESTPAC, ODINBLACK SEA and ODINCET, which are being established at this time.* The African Marine Atlas is being further developed under the ODINAFRICA IV project. The Caribbean Marine Atlas is also currently under development. Others ODINs are potential candidates to develop Marine Atlases such as ODINCARSA and ODINBlackSea.

*342* *Recommendation 9: IODE should consider establishing an inter-sessional working group to develop indicators and benchmarks to assess the amount of data and information being exchanged for the different types of data to track the progress being made over the years*. An inter-sessional working group was established and has completed a first draft, however no further follow up was accomplished. It should be noted that ODP could be used as a tool to assess the data flow within the NODCs. All IODE projects that are referenced in the GCOS Implementation Plan should ensure that they report on their designated actions in the Plan.

*343* *Recommendation 10: IODE should facilitate networking activities among the WDCs so that issues related to quality control of data, management of duplicate data sets, flagging of particular data sets, and partition of data to be archived within the WDCs are addressed*. This recommendation was discussed under agenda items 8.2 and 9.5

*344* *Recommendation 12: IODE should conduct a global survey to address the issue of the metadata catalogues, and to identify needs to be approached in the guidelines to be developed with respect to such catalogues. It should also stress the issue of placing such catalogues on the web pages as indicators that the process can be reviewed externally and by IODE*: IODE Officers stated that metadata standards and implementation of a metadata tool will be addressed by the JCOMM/IODE Ocean Data Standards Pilot Project and the JCOMM/IODE ETDMP Task Team for Metadata.

*345* The Ocean Data Standards project has progressed slowly over the inter-sessional period. It was suggested that this project consider metadata standards and tools and identify and recommend metadata development tools.

## 8.2 IODE ARRANGEMENTS FOR THE LONG-TERM SECURE ARCHIVAL OF DATA AND INFORMATION

*346* This Agenda Item was introduced by Dr Lesley Rickards (Member WDS Scientific Committee) referring to Document IOC/IODE-XXI/36 (*Development of a new ICSU World Data System and its relationship with IODE*).

*347* She recalled that the International Council of Scientific Unions (now International Council for Science) established the World Data Center system to serve the IGY (International Geophysical Year) of 1957–1958, and developed data management plans for each IGY scientific discipline. Multiple Centers were established to guard against catastrophic loss of data, and for the convenience of data providers and users. Three World Data Centers for Oceanography were established: Silver Spring, USA; Obninsk, Russian Federation and Tianjin, China. These centres have been collaborating with IODE as long-term permanent archives of oceanographic data since their establishment.

*348* A new ICSU World Data System (WDS) has been created through a decision of the 29th General Assembly of the International Council for Science (ICSU). WDS builds on the 50-year legacy of the ICSU World Data Centre system (WDC) and the ICSU Federation of Astronomical and Geophysical data-analysis Services (FAGS). Many existing WDCs and FAGS Services, as well as numerous other data centres, services and activities, have already expressed interest in becoming part of the new system.

*349* The WDS concept aims at a transition from existing stand-alone WDCs and individual Services to a common globally interoperable distributed data system that incorporates emerging technologies and new scientific data activities.

*350* WDS will enjoy a broader disciplinary and geographic base than previous ICSU bodies and will strive to become a worldwide 'community of excellence' for scientific data. To this end, WDS will work closely with ICSU's Committee on Data for Science and Technology (CODATA) and with the new ICSU Strategic Coordinating Committee for Information and Data (SCCID).

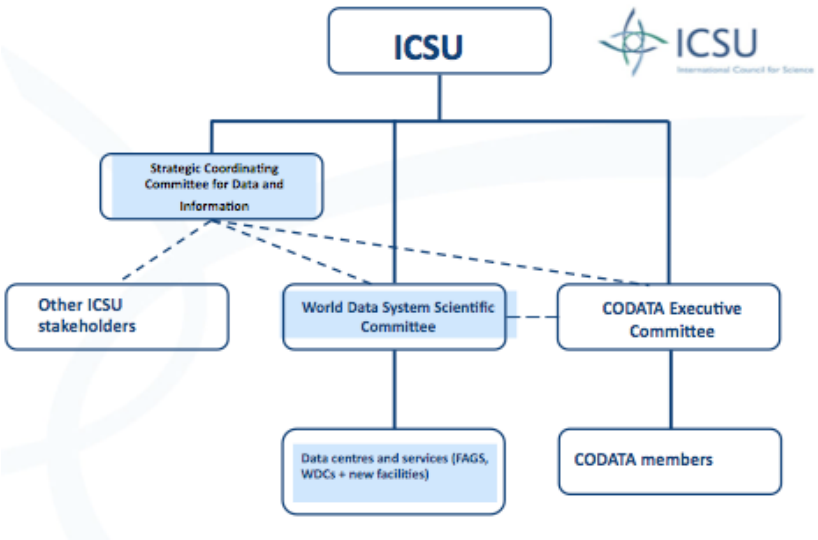


Figure 2: Management structure of the WDS

*351* The primary goals for the WDS are to ensure the long-term stewardship of quality-assessed data for research and education, to provide data and related data services to the

international science community or other stakeholders, and to incorporate scientific data activities into a common, globally interoperable, distributed data system.

*352* Early activities of WDS Scientific Committee have included developing the WDS constitution, data policy, implementation plan and membership criteria. A web-site has been established, collaboration begun with International Polar Year data management and an International Programme Office will commence activities soon. The first WDS Scientific Conference "Global Data for Global Science", will take place in September 2011.

*353* Dr Rickards recalled that IODE has collaborated with WDCs for Oceanography for many years and wishes that collaboration to continue. IODE is one of the organisations which expressed an early interest in becoming a member of the WDS along with the three former WDCs for Oceanography and the WDC for Marine Environmental Data.

*354* She further informed the Committee that applications were welcomed since 1 February 2011.

*355* The Secretariat expressed its regret about the limited information provided by ICSU on the WDC to WDS transition. The Secretariat informed the Committee that it had submitted an expression of interest for IODE to become a corporate member of the WDS but to date no feedback has been received. Information on the WDS criteria is provided under Agenda Item 8.4.

*356* The Committee established a sessional working group to deal with this issue that was tasked to prepare a statement by IODE for ICSU.

*357* **The Committee adopted** the statement as attached as Annex VII.

*358* **The Committee established** an inter-sessional working group. The terms of reference of the Group were defined as "Description *of the new IODE data and information system and its linkages with other systems (one part will focus on WDS)*". It was noted that the Group would also deal with the revision of the IOC Strategic Plan for Oceanographic Data and Information management. The membership was discussed under Agenda Item 11.

## 8.3 JCOMM AD HOC TASK TEAM ON RNODCS AND SOCS

*359* This Agenda Item was introduced by Ms Sissy Iona (Chair JCOMM DMCG) referring to Document IOC/IODE-XXI/35 (*JCOMM ad Task Team on RNODCs and SOCs*)**.**

*360* She reminded the Committee that according to the JCOMM/DMCG-IV Report, Action 62-8.1.3. (16), an *ad hoc* task team was convened to address the RNODCs and SOCs issue and develop a proposal for integrating them into a single system of dedicated centres contributing to the ODP, and with specialized functions (archive, QC, monitoring, etc.).

*361* According to this proposal (see Appendix A of Document IOC/IODE-XXI/35) which is not responsible for providing any funding recommendations that will impact RNODCs and SOCs, or the RTMC, the *ad hoc* Task Team recommends the integration of these centres into a more unified system of (tentatively) "Global Data Assembly Centres" (GDACs) for all drifting buoys in a similar role to the Argo and OceanSITES GDACs server for their programmes.

*362* The potential benefits of the proposal are analyzed in the full report and it is expected that such a centralized scheme can assure the most up-to-date and synchronized versions of the data and their catalogues. The experience of existing DACs in receiving, archiving real time data and applying delayed mode quality control will be implemented in the future scheme.

*363* To discuss this proposal and its implementation, the *ad hoc* Task Team recommends that representatives from the RNODC/DB and SOC/DB schedule a workshop with representatives from this Task Team, the RTMC, PIs, DACs and GDACs to discuss the implementation of such a system, determine the Information Technology impacts for both Centres, and develop a timeline for achieving Initial Operational Capability and Full Operational Capability. The following are suggested as additional specific elements of the proposal for discussion at the workshop:

- SOC/DB will be a Real-Time GDAC for the data within 30 days.
- ISDM will be a Delayed Mode GDAC for the data 30 days passed and received from Real-time GDAC.
- AOML could be a special analyzed GDAC to assist other data centres including GDACs and other projects to develop special products and QC procedures/techniques.

*364* It is also expected that an installation plan of ODP servers in the system will be discussed at the workshop considering the capacities of the centres which will participate in the system.

*365* **The Committee approved** the proposal and requested the *ad hoc* Task Team to draft a Recommendation for JCOMM-IV, including ToR of such centres, as well as background information and requested the Chair of JCOMM DMCG to keep the Committee informed of progress on the integration of these centres.

## 8.4 IODE DATA AND INFORMATION CENTRES QUALITY MANAGEMENT AND CERTIFICATION

*366* This Agenda Item was introduced by Dr Lesley Rickards (IODE Past-Chair). She recalled that IODE-XX had tasked the IODE Officers to look into this matter and report back to the next Session, and also to monitor the accreditation and certification process of data centres established by the WDS.

*367* Dr Rickards then provided information on the WDS certification procedure:

- Facility responded to initial WDS survey, or provides a letter of interest
- Facility demonstrates its capabilities using the on-line application to describe its capabilities
- If necessary, an on-site review may take place (to be decided by negotiations with the candidate)
- Accreditation as a WDS member
- Review of accreditation should take place approx. every 5 years

*368* The certification criteria has four categories:

- WDS general requirements and policies (Organisation specific requirements)
- Organisational framework
- Management of data, products and services
- Technical infrastructure

*369* The Committee was informed that there are also other quality management frameworks such as the WMO QMF (see http://www.wmo.int/pages/prog/amp/QMF-

Web/home.html). Some of the IODE data centres have also identified criteria for Quality Management.

*370* **The Committee established** an inter-sessional working group that will "*identify a set of quality management criteria for IODE NODCs taking into account those defined for the WDS*". The initial membership of the Group will include Argentina, Australia, Belgium (both NODCs), Canada, Chile, China, France, Germany, Greece, India, Japan, Republic of Korea, Mexico, The Netherlands, Russian Federation, Tanzania, Turkey, Ukraine (both NODCs), United Kingdom, United States. This group will communicate by email. **The Committee designated** Mr Greg Reed (Australia) to lead the work of the Group.

## 9. IMPLEMENTATION OF THE IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE: COOPERATION WITH OTHER PROGRAMMES AND ORGANIZATIONS

### 9.1 COOPERATION WITH IOC PROGRAMMES

*371* This Agenda Item was introduced by Dr Edward Vanden Berghe on behalf of Dr Gwen Moncoiffé (Chair GE-BICH). He briefly informed the Committee on ongoing cooperation with other IOC Programmes. As reported during IODE-XX cooperation has been established with the IOC HAB (Harmful Algal Blooms) programme through the Harmful Algal Information System (HAIS). The Harmful Algal Information System, HAIS, will when fully established consist of access to information on harmful algal events, harmful algae monitoring and management systems worldwide, current use of taxonomic names of harmful algae, and information on biogeography of harmful algal species. Supplementary components are an expert directory and a bibliography. The expectation is that it will be a service to scientists, managers of regulatory monitoring programmes, and to policy administrators to access to high quality data on current taxonomic names of harmful algae, the biogeography of harmful species and occurrence of harmful algal events, together with details of monitoring and management systems worldwide, directories of experts, and bibliography on harmful algae. The HAIS System is being built by IPHAB and IODE in cooperation with WoRMS, ICES, PICES and ISSHA. The Joint IPHAB/IODE Task Team on the development of the Harmful Algal Information System oversees the development. The network and HAB related groups within IOC, ICES, PICES etc gives an unique position at a cross road of very diverse and multidisciplinary sets of data. HAIS comprises:

- HA Events with ICES, PICES et al (HAEDAT)
- Biogeography in OBIS with ISSHA (HABMAP)
- Taxonomy with WoRMS ('IOC Taxonomic Reference List on Toxic Species' which is the back bone of HAIS)
- References with ASFA and OceanDoc
- Expert Directory with IODE (OceanExpert)
- Monitoring and management design with ICES (MONDAT)

*372* During 2009–2010 the IPHAB Taxonomic Task Team meet in October 2010 to update the 'IOC Taxonomic Reference List on Toxic Species' in WoRMS Action has been taken to have all ICES Countries update and complete submissions to HAEDAT before March 2011. HABMAP was re-launched jointly with OBIS at 14th International Conference on HAB at Crete Nov 2010 (joint poster and Editors meeting) and the HAEDAT format has been customized to OBIS. A FP7 proposal entitled SpEcoSS (SPecies to ECOsystems using Semantic Standards) has been submitted with IOC HAB Centre as partner. If approved it will contribute to further develop elements of HAIS. A FP7 'Initial Training Network' Proposal has been

submitted IOC UNECO as partner and will if approved provide a two-year post doc full time to compile and analyze data for HAIS primarily but not exclusively from EU. The implementation of these projects will in 2011–2013 involve the staff at the IODE Project Office. If the two projects are funded HAIS is expected to progress significantly. If not funded focus in 2012–2013 will be at ensuring continuous data submission to HAEDAT, stepwise establishment of HABMAP in OBIS and maintenance of the 'IOC Taxonomic Reference List on Toxic Species'. This will require technical support from IODE Project Office staff at same level as during 2009–2010.

*373* A few Member States inquired about who contributed Harmful Algae-related data to OBIS. Dr Vanden Berghe responded that there were several providers of these data. Some datasets were collected by HAB programmes in the USA, and by the IPHAB itself. Many data records for HAB-related species come from the Continuous Plankton Recorder.

*374* **The Committee noted** that the collaboration between IODE and IPHAB was very fruitful. The fact that IODE and several of its programmes were asked to collaborate with a sister project within IOC is indicative of the appreciation for IODE's expertise and provides an excellent example of the implementation of the IOC Strategic Plan for Oceanographic Data and Information Management.

## 9.2 COOPERATION WITH WMO

*375* This Agenda Item was discussed under Agenda Item 6.2.2.1.

## 9.3 COOPERATION WITH POGO

*376* This Agenda Item was introduced by Mr Greg Reed. He recalled that Dr Murray Brown has lectured a data management class (2009–2010 season) during the "Centre of Excellence Student Training in Observational Oceanography" organized at the Bermuda Institute of Ocean Sciences (BIOS) within the framework of the Nippon Foundation (NF) –Partnership for Observations of the Global Ocean (POGO) Centre of Excellence at the Bermuda Institute of Ocean Sciences (BIOS). The purpose of this programme is to expand world-wide capacity to observe the oceans, to develop human resources in developing countries; to expand international networking in ocean sciences, with an emphasis on training young scientists from developing countries; and to strengthen ocean networking relations between developed and developing countries. POGO has expressed the desire to formalize the cooperation between IOC/IODE and NF-POGO.

*377* Several Member States reported cooperation with POGO, e.g. the United Kingdom and Germany through cruise programmes, and India.

*378* **The Committee welcomed** the cooperation between IODE's OceanTeacher and POGO, and **recommended** that the cooperation be formalized, possibly through a MoU.

## 9.4 COOPERATION WITH SCOR

*379* This Agenda Item was introduced by Mr Peter Pissierssens, Technical Secretary. He reported that cooperation with SCOR has developed extremely well. He referred to the SCOR/IODE/MBLWHOI Library Project on Data Publication, discussed under Agenda Item 6.2.3.

*380* In addition IODE was invited to the "Conference on Developing a Global Strategy for Capacity Building in the Ocean Sciences", Bremen, Germany, 16–18 August 2010. The purpose of the meeting was to bring together representatives of organizations interested in capacity development for ocean research and observations, to discuss their experiences with

past and existing activities, to identify new activities, and to discuss how the organizations could work together to create a global strategy for capacity building for ocean research and observations. This was the first meeting to bring together representatives of the international organizations most active in capacity development for ocean sciences. The University of Bremen's Center for Tropical Marine Ecology (ZMT) had provided local support. IODE was represented by Mr Peter Pissierssens. A presentation had been made on the IODE capacity building activities including the ODINs and OceanTeacher (Academy). The meeting identified a number of approaches to strengthen capacity and considerations for their implementation: (i) funding for participation in science meetings; (ii) grants for short-term training in ocean observations; (iii) grants for short-term training in ocean research; (iv) grants for training in data and information management; (v) Summer schools; (vi) training for professionals; (vii) training through research; (viii) shipboard experience; (ix) visiting professorships; (x) Centres of Excellence in oceanography training; (xi) leadership training; (xii) distance learning; (xiii) internships in international secretariat.

*381* Under the topic "Summer schools" IODE volunteered to set up a web-based portal where institutions providing summer school opportunities can enter such information and interested students can consult the database. The portal is available on http://www.oceansummerschools.org/. It was launched in March 2011.

*382* The Committee was informed that SCOR has been collaborating closely also with the Census of Marine Life, and with its (at that time) OBIS. One of the joint activities was the establishment of a working group on Technologies for Ocean Observations; OBIS was part of this working group. Part of the output of the working group is a series of web pages on the Census web site describing technologies. Since it is not clear how these pages will be maintained after the Census ended in 2010, the secretariat was asked to contact the Census, with a view to investigate whether IODE could play a role in the further maintenance of these pages. This working group also coordinated CoML's contribution to the OceanObs '09 meeting, which included a paper on OBIS (http://www.oceanobs09.net/blog/?p=271). SCOR also organized a workshop 'Ocean Biology Observatories' (http://www.scor-int.org/OBO_Workshop.htm), held in Mestre, Italy from 16 to 18 September 2009, in which OBIS participated.

*383* **The Committee welcomed** the close collaboration with SCOR through the project on data publication and on the "Summer schools portal".

## 9.5 COOPERATION WITH ICSU

*384* This Agenda Item was discussed under Agenda Item 8.2.

## 9.6 COOPERATION WITH EUMETSAT

*385* This Agenda Item was introduced by the representative from EUMETSAT, Mr Henk Verschuur. He informed the Committee that NOAA, IODE and EUMETSAT jointly organized the EUMETSAT-NOAA-IODE Training Course on the Use of Satellite Wind and Wave Products for Marine Forecasting (14–18 December 2009), which was held at the IOC Project Office for IODE in Ostend. Given the success of this activity, this training event could be considered as the first step for further cooperation in the field of oceanography. EUMETSAT expressed its great satisfaction with the facilities and services offered by the Project Office as well as with the co-sponsoring of the event. EUMETSAT prime objective is to provide its European Member States with meteorological satellite data, including those for climate monitoring and ocean applications. Recognizing that IOC and EUMETSAT already have been cooperating on various ocean-climate issues (e.g. JASON launching/operation, Ocean Colour research support, Indian Ocean GLOSS data transmission), EUMETSAT wishes to further extend its partnership with IOC.

*386* On 23 June 2010 Ms Boram Lee (IOC) and Mr Peter Pissierssens (IOC/IODE) were invited to the EUMETSAT facilities in Darmstadt, Germany where they met with Dr Mikael Rattenborg, Director of Operations; Mr Henk Verschuur, Senior Training Officer; Dr Leo van de Berg, Meteorological Operations; Dr Julia Figa Saldana, Product Operations; Dr Kenneth Holmlund, Head of Met. Operations; Dr Harald Rothfuss, EUMETSAT Data Centre; Dr Volker Gartner, Head of User Services, and; Dr Hans Bonekamp, Ocean Mission Scientist. EUMETSAT expressed its appreciation to the IOC training activities through the IOC Project Office for IODE in Ostend, and wished to continue and to expand the partnership for the future training courses. It was agreed that such cooperation would be mutually beneficial and synergetic therefore both organization should extend the cooperation in the feasible areas. It was agreed that a second Training Course on the Use of Satellite Wind and Wave Products for Marine Forecasting should be organized, in 2011. A possible venue would be the IOC Project Office for IODE, Ostend. The objectives and expect results of this course coincide with the work of IOC/IODE in Ostend, as well as the JCOMM support for storm surge application. It was agreed that IOC, through IOC Project Office for IODE and JCOMM, will support this course, and continue to be involved in the organization.

*387* EUMETSAT is planning to procure and operate a “Synergie” workstation, which can collect, process and visualize global meteorological and satellite data. Météo–France developed these tools for general meteorology, aviation and marine applications. It was developed as a decision making tool for forecasting and warnings. It was discussed that training on the use of the “Synergie” station could be the subject of cooperation between IOC and EUMETSAT and might be used for training activities in other regions, e.g. in Africa.

*388* The WMO Training department and EUMETSAT has been closely working together on the development of the training infrastructure for training on satellite meteorology through the Virtual Laboratory concept. Considering that IOC/IODE has been communicating with the WMO responsible officers to investigate the possibility to combine Ocean Teacher and Virtual Laboratory activities. IOC and EUMETSAT are ready to work closely in this area. It also was agreed that the OceanTeacher can be a very useful tool for a “blended learning”, combining the pre-study at home (through Ocean Teacher/VLab), on-site training and tame-home work (through Ocean Teacher/VLab/Synergie workstation). It was also suggested that EUMETSAT provide content for OceanTeacher related to the use of the EUMETSAT Product Navigator. Reference is made to:

http://www.eumetsat.int/home/Main/Access_to_Data/ProductNavigator/index.htm

*389* The representative of EUMETSAT stated that OceanTeacher is an excellent tool for “blended learning”, i.e. the combination of an online component of distance learning together with a classroom component. He noted that, from the discussions during this Session, he concluded that there exists a need for data. He noted further that satellite data are very expensive to collect and should therefore be utilized in the most varied possible ways. EUMETSAT now has an archive covering more than 25 years which could be useful for climate studies. The data are available for download and on DVD. The data can also be obtained (free of charge) through the EUMETCAST system which utilizes affordable DVB technology.

*390* All ODIN coordinators stressed the importance of satellite data. ODINAFRICA noted that the use of satellite data had been planned in ODINAFRICA-IV but this had not happened. Availability of these data would be beneficial to the African Marine Atlas. ODINCARSA LA noted that various levels of expertise exist in Latin America. Experts from some countries in the region could assist with teaching on the use of satellite data, whereas other countries required this training. Cooperation from EUMETSAT would be most welcomed. ODINCARSA/CMA noted that a satellite imagery processing facility exists in Trinidad and Tobago and satellite imagery is being used for e.g. disaster management. Cooperation with

EUMETSAT would be able to improve expertise in the region. The ODINWESTPAC has also expressed their interest in close collaboration with EUMETSAT on the use of satellite data.

*391* It was also suggested to make satellite data products available through ODP. Taking into account the huge data volumes this matter would require further discussions between EUMETSAT and the ODP technical experts.

*392* The delegate from the United Kingdom reminded the Committee that the former UNESCO software package BILKO is still being used and maintained by the National Oceanography Centre (NOC). He recommended that cooperation be established between the BILKO project team and OceanTeacher.

*393* **The Committee welcomed** the cooperation with EUMETSAT through joint training courses and **recommended** the creation of a discussion forum and possibly to organize a meeting involving EUMETSAT, ODIN coordinators/technical experts and ODP technical experts to further discuss the possible cooperation between EUMETSAT and IODE.

9.7 COOPERATION WITH IAMSLIC

*394* This Agenda Item was discussed under Agenda Item 6.1.2.

9.8 COOPERATION WITH FAO

*395* This Agenda Item was discussed under Agenda Item 6.1.2 and 6.2.8. In addition Dr Vanden Berghe informed the meeting of a project, led by the University of Pisa, submitted to the EU, which passed the first stages of approval. VLIZ, OBIS and FAO are involved in this project. The project title is 'iMarine', and its objectives are to develop IT infrastructure to support the management of marine living resources. OBIS' role in the project will be to set up facilities to develop environmental envelope modelling based on OBIS data; NODCs will be contacted with assistance in accessing oceanographic data. VLIZ' contribution is related to the World Register of Marine Species. The iMarine project is a further development of the D4Science project, which was already mentioned in the report of MIM. Dr Vanden Berghe participated in the recent meeting of COFI; OBIS was presented in two different Side Events during this meeting.

9.9 OTHERS (GEO/GEOSS, UNEP, WCRP, SOLAS, ...)

*396* Members of the Committee were invited to report on ongoing or proposed collaboration with other organizations.

*397* Dr Vanden Berghe reported that OBIS is involved in collaborative work with several international organizations, as reported under agenda item 5.1.

9.10 IOC OCEANOGRAPHIC DATA EXCHANGE POLICY:
IMPLEMENTATION BY MEMBER STATES AND COOPERATING PROGRAMMES

*398* This Agenda Item was introduced by Mr Robert Gelfeld. He reminded the Committee that the IOC Assembly had requested IODE to regularly report on the status of implementation by IOC Member States of the IOC Oceanographic Data Exchange Policy as adopted through IOC Resolution-XXII-6 (2003). Mr Gelfeld informed the Committee that, in order to obtain this information, the following question was included in the online national report survey: "Has your country applied (in 2009 and/or 2010) the IOC Oceanographic Data Exchange Policy adopted as IOC Resolution XXII-6 in 2003 (http://www.iode.org/policy).

*399* Mr Gelfeld reported that sixty-five Member States responded to this question in the online survey. 61 % have applied the IOC Data Exchange Policy, 23 % have not and 16 % do not know. Though this shows that though the majority of reporting Member States have applied the IOC Data Exchange Policy, there is work to be down by the remaining Member States to have this policy in place. The timely, free and unrestricted international exchange of oceanographic data and associated metadata is imperative for future of the oceanographic community. This policy should be reviewed by each Member State and should become part of their Oceanographic Data Policy.

*400* **The Committee expressed concern** about the 16 % of respondents who answered "don't know" and the 23 % who answered "no" and **noted** that answers like "don't know" possibly resulted from partial application of the Policy whereas the "no" could possibly refer to non-IOC programmes. **The Committee instructed** the Secretariat to contact Member States who answered "don't know" and "no" in order to qualify their answer. **The Committee also instructed** the Secretariat to improve the survey further by including comment boxes in the cases of "no" and "don't know" answers.

## 10. IODE PUBLIC AWARENESS

### 10.1 IODE WEB SITES, BROCHURES, POSTERS AND PUBLICATIONS

*401* This Agenda Item was introduced by Mr Peter Pissierssens. He informed the Committee that the IODE web site has been further developed. It uses a Joomla Content Management System, with custom-designed add-on features that allow the management of events, expert information, and documents. As mentioned in Agenda Item 6.2.10 the add-on software relies heavily on OceanExpert. In addition to the main IODE web site (http://www.iode.org) a number of projects have established their own web presence. This is the case for most of the ODINs. Some are using the Joomla content management system software (indicated by 'dynamic' below) and can be easily edited by multiple users, whereas others are using static html:

- http://www.odinafrica.org (dynamic) (hosted by IODE Project Office)
- http://www.odinblacksea.org/ (static)
- http://www.odincarsa.org/ (dynamic) (hosted by IODE Project Office)
- http://www.iode.org/odinecet/ (static) (hosted by IODE Project Office)
- http://www.odinwestpac.org/ (hosted by NMDIS, China)

*402* The IOC Project Office is also hosting national web sites for many ODINAFRICA data and information centres:

Benin http://www.nodc-benin.org/;
Cameroon http://www.nodc-cameroon.org/;
Comoros http://www.nodc-comoros.org/;
Congo http://www.nodc-congo.org/;
Cote d'Ivoire http://www.nodc-cotedivoire.org/;
Egypt http://www.nodc-egypt.org/;
Gabon http://www.nodc-gabon.org/;
Ghana http://www.nodc-ghana.org/;
Guinea http://www.nodc-guinea.org/;
Kenya http://www.nodc-kenya.org/;
Madagascar http://www.nodc-madagascar.org/;
Mauritania http://www.nodc-mauritania.org/;
Mauritius http://www.nodc-mauritius.org/;
Mozambique http://www.nodc-mozambique.org/;

Nigeria http://www.nodc-nigeria.org/;
Senegal http://www.nodc-senegal.org/;
Seychelles http://www.nodc-seychelles.org/;
Tanzania http://www.nodc-tanzania.org/ and
Togo http://www.nodc-togo.org/.

*403* The IODE GE-BICH has created its own wiki on http://sites.google.com/site/gebichwiki/ to post detailed technical information on the various activities of the GE-BICH.

*404* In other agenda items the various online service web sites have been discussed:

- http://www.oceandataportal.org (hosted by IODE Project Office)
- http://www.oceanteacher.org (hosted by IODE Project Office)
- http://www.oceanexpert.org (hosted by IODE Project Office)
- http://www.oceandocs.net (hosted by IODE Project Office)
- http://www.opensciencedirectory.net
- http://www.oceansummerschools.org (hosted by IODE Project Office)
- http://www.aquaticcommons.org (hosted by IODE Project Office for IAMSLIC)
- and the new OBIS web site http://www.iobis.org

*405* Regarding publications Mr Pissierssens reported that during the inter-sessional period (May 2009-February 2011) the following documents were published by IODE:

- 2 reports of IOC Governing and Major Subsidiary Bodies (IODE-XX summary report and executive summary);
- 3 IOC Manuals and Guides
- 10 IOC Workshop Reports
- 3 Reports of IODE Groups of Experts
- 7 IOC Circular Letters

*406* It was noted that reports of Training Courses are no longer published as such as the content is available through OceanTeacher. The working documents for IODE meetings are not included in the above list, and that all documents (including working documents) are made available electronically through the IODE web site. Nevertheless the following documents were also made available in printed form (and are available upon request):

- Ocean Data Standards: Recommendation to Adopt ISO 8601:2004 as the Standard for the Representation of Date and Time in Oceanographic Data Exchange; 11th February 2011/ IOC Manuals and Guides No. 54, Volume 2
- GTSPP Real-Time Quality Control Manual Revised Edition, 2010; C. Sun; 6th December 2010/ IOC Manuals and Guides No. 22 rev.
- Ocean Data Standards: Recommendation to Adopt ISO 3166-1 and 3166-3 Country Codes as the Standard for Identifying Countries in Oceanographic Data Exchange; 6th January 2010 /IOC Manuals and guides No. 54, Volume 1

*407* The Committee was informed that a QC manual had been received from MyOcean which had been offered for publication by IODE in the IOC Manuals and Guides series. **The Committee requested** the Secretariat to publish this document as soon as possible.

## 10.2 50TH ANNIVERSARY OF IODE IN 2011

*408* Ms Sissy Iona introduced this Agenda Item by referring to Document IOC/IODE-XXI/41 (*50th Anniversary of IODE in 2011*).

*409* She reminded the Committee that an inter-sessional working group (chaired by Greece) was established during the IODE-XX Session to propose a plan for the commemoration of the 50th Anniversary of IODE in 2011. The Officers at their Session on March of 2010 discussed the proposals and finalized the future actions.

*410* Ms Iona reported on the following activities that were implemented so far:

(i) The IODE 50th Anniversary International Conference was held 21–22 March in Liège, Belgium and had attracted 120 participants from 40 countries. Detailed information about the Conference and the agenda can be found on the web site (http://www.iode2011.be). The Government of Belgium hosted and provided considerable support towards the organization of the Conference.

(ii) The anniversary logo was provided by Greece and is used on all web sites, documents and promotional materials. It is available upon request from the IODE Secretariat.

(iii) Promotional Material that have been produced by the IODE Project Office and the Member States.

*411* The following promotional materials were produced: (i) 2011 calendar that was already distributed to the Members States; (ii) a USB stick with the IODE anniversary bibliography prepared by GE-MIM; (iii) mugs with the IODE50 logo, provided by the Government of Flanders through the IOC Project Office for IODE; and (iv) T-shirts and mouse pads, provided by Greece.

*412* Germany had promised to produce two maps with research vessels from 1961 and 2011. This production is well underway and the Committee was requested to provide photos of current and historic research vessels to Friedrich Nast.

*413* For the remaining of 2011 the Member States were invited to contribute with other activities, such as providing the IODE photo gallery with photos of their institutes from the past and the present.

*414* Turkey suggested the development of a web-based document describing the history of the NODCs and volunteered to collate this information and to work together with the IODE Co-Chair to develop this product. The document will be completed before the end of 2011.

*415* Japan informed the Committee that an international symposium on integration and exchange of data will be held in December 2011. Key speakers will be contacted shortly.

*416* **The Committee expressed** its gratitude to Belgium and Greece for support provided to celebrate the 50th anniversary as well as to other Member States who have pledged support or will organize activities to commemorate the anniversary.

*417* **The Committee decided** that the Proceedings of the IODE 50th anniversary international conference should be published including the full papers as well as extended abstracts for posters. **The Committee requested** Greece to take the role of Editor of the Proceedings. The Proceedings should be published before the end of 2011.

## 11. IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (2012–2015)

*418* This Agenda Item was introduced by Mr Greg Reed, Co-Chair. He recalled that the "IOC Strategic Plan for Oceanographic Data and Information Exchange (2008-2011)" was prepared by Dr Lesley Rickards, Mr Greg Reed as well as other IODE experts. The Strategy

was adopted by the IOC Assembly at its 24th Session (2007) through Resolution XXIV-9 and the Strategy was subsequently published as IOC Manuals and Guides No. 51.

*419* It was recalled that the major elements of the Strategy are:

- Adherence to the IOC Oceanographic Data Exchange Policy;
- Governance by a management committee, aided by a technical task team, supported by data and information coordination units;
- A permanent long-term data archiving centre for all data, which operates to agreed standards;
- Recommended best practice for quality control, documented and made easily accessible and available;
- Acceptance and implementation of a set of interoperability arrangements, including technical specifications for collecting, processing, storing, and disseminating shared data, metadata and products;
- Interoperability between the different end-to-end systems for IOC data and with other systems (e.g. GEOSS, International Council for Science (ICSU), International Council for the Exploration of the Sea (ICES), Census of Marine Life (CoML)/Ocean Biogeographic Information System (OBIS), US Integrated Ocean Observing System Data Management and Communications (IOOS DMAC) system, SeaDataNet, etc.) through the use of service oriented architecture;
- To continue to develop Ocean Data and Information Networks (ODINs) backed up by OceanTeacher as a capacity building tool, whilst extending OceanTeacher through cooperation with WMO, JCOMM and others as appropriate;
- Development of appropriate metrics to help evaluate the data and information system;
- Facilitation of proper citation of data sets by providing all the required elements of a citation including an unambiguous, unchanging reference.

*420* Communication within and between IOC programmes, and with IOC's partners, was highlighted as essential to ensure that a fully integrated data system rather than the current multitude of systems results. In order to promote communication and coordination between IOC programmes the "Data and Information Management Advisory Group" was established with Chairs of other IOC subsidiary bodies as members. Regrettably this Group has remained largely inactive.

*421* A more successful outcome of the Strategy has been the development of the IODE Ocean Data Portal and JCOMM/IODE Ocean Data Standards pilot project, both discussed under separate agenda items. An unfortunate omission in the Strategy, as indicated under agenda item 6.1.2 was the lack of marine information management elements.

*422* **The Committee established** an inter-sessional working group, which will have the objective of updating the Strategic Plan. This will include the description of a new IODE data and information system and its linkages with other systems (one part will focus on WDS). (see also Agenda Item 8.2). **The Committee requested** that the results of OceanObs'09 would be taken into account.

*423* **The Committee decided** that the initial membership will include Argentina, Australia, Barbados, Belgium (both NODCs), China, Germany, Greece, India, The Netherlands, Russian Federation, Ukraine (both NODCs) United States, Chair GE-MIM, Chair GE-BICH, Chair GE-OBIS, Chair ETDMP, Chair JCOMM DMCG. The Group will be led by Australia with assistance from the United Kingdom.

*424* The deadline to complete the work is March 2012. It was decided that a meeting will be required to compose the document. Member States were invited to self-fund their participation.

## 12. ANY OTHER BUSINESS

*425* Under Agenda Item 2.1 the Committee was requested to identify additional topics for discussion. None were proposed.

## 13. REQUIRED RESOURCES AND PLAN OF ACTION FOR 2010–2011 (CURRENT UNESCO BIENNIUM 2010–2011) AND 2012–2013 (NEXT UNESCO BIENNIUM)

*426* This Agenda Item was introduced by Mr Greg Reed. He informed the Committee that the funding through the UNESCO Regular Programme for the next inter-sessional period would cover two UNESCO biennia: 2010–2011 (35 C/5) and 2012–2013 (36 C/5). He noted that from the 35 C/5 allocation approximately US$ 80,000 will be available for the remainder of 2011. For 2012–2013 it is expected that a total amount of US$ 285,500 will be available, including US$ 90,000 earmarked for OBIS. This represents a substantial increase for OBIS (which was allocated only US$ 10,000 for 2010–2011).

*427* In terms of extra-budgetary funding he will note that funding has been confirmed from the following sources (as on 15 February 2011):

- Approx. EUR 400,000/year (of which approx. EUR 180,000 is available for training courses and meetings) for the operations of the IOC Project Office for IODE, Ostend, Belgium [from the Government of Flanders, Belgium through the Flanders Marine Institute];
- USD 2,000,000 for the implementation of the ODINAFRICA-IV project [from the Government of Flanders, Belgium, through the Flanders-UNESCO Trust Fund for Science] – ending 31/12/2013;
- USD 240,000 for the implementation of the Caribbean Marine Atlas project [from the Government of Flanders, Belgium, through the Flanders-UNESCO Trust Fund for Science] – ending 31/12/2013;
- USD 670,000 for the implementation of the OceanTeacher Academy project [from the Government of Flanders, Belgium, through the Flanders-UNESCO Trust Fund for Science] – ending 31/12/2013;
- USD 309,943 for OBIS [From the United States of America];
- USD 88,986 for OBIS [From Australia];
- USD 10,000 for OBIS [from Brazil].
- An additional commitment was made by Canada but had not yet been received.

*428* IODE has been invited to participate in a few projects submitted to the European Commission for funding. They include SeaDataNet 2, iMarine (together with IOC/HAB), SpEcoSS - SPecies to ECOsystems using Semantic Standards (together with IOC/HAB). The Committee was informed that the European Commission had not accepted the SpEcoSS proposal.

*429* The Committee was reminded that IODE is currently supported by only one UNESCO regular position (Peter Pissierssens). The two additional professional positions (Mr Mika Odido and Mr Aditya Kakodkar) are funded from ODINAFRICA and OceanTeacher extra-budgetary projects respectively. As indicated above these projects will end on 31/12/2013.

*430* Mr Reed noted that the requested funding exceeded the available funds from the UNESCO Regular Programme and noted that additional extra-budgetary funding would need to be identified to implement all activities.

*431* **The Committee instructed** the Co-Chairs to bring to the attention of the IOC Assembly again the need to diversity the sources of extra-budgetary funding, recalling that 90 % of the extra-budgetary funding for IODE (excluding OBIS) is still provided by one Member State (Government of Flanders, Belgium). **The Committee also reiterated** its request to Member States to second experts to the IOC Project Office for IODE, to ensure that the necessary expertise is available there. Alternative Member States could assist IODE by hosting regional events such as training courses and co-funding participants.

*432* Referring to the adoption by IOC of OBIS within IODE, **the Committee urged** Member States to provide additional financial and in-kind support, and **called on** the UNESCO Director-General to create a Professional Position for the OBIS Programme Specialist, in order to ensure the long-term sustainability of this important new IOC/IODE activity.

*433* **The Committee adopted** Recommendation IODE-XXI.7.

## 14. ELECTIONS OF CO-CHAIRS

*434* The IODE Technical Secretary will introduce this item by referring to the IOC Rules of Procedure (Document IOC/INF-1166), and more particularly to Rule 25, para. 3.

*435* The Technical Secretary will inform the Committee that, in accordance with the above Rules, and taking into account that both Co-Chairs have completed two terms (two inter-sessional periods) new Co-Chairs need to be elected. He will inform the Committee that IOC Circular Letter No. 2360 was issued on 14 September 2010, inviting Member States to nominate candidates for the two Co-Chairs. The following nominations were received:

- Ms Sissy Iona (Greece)
- Mr Ariel Troisi (Argentina)

*436* The CV and personal perspective on the future of IODE was posted on the IODE web site on page:

http://www.iode.org/index.php?option=com_content&view=article&id=238%3Aiode-xxi-candidatures-for-iode-co-chairs&catid=11&Itemid=155

*437* **The Committee elected** Ms Sissy Iona and Mr Ariel Troisi as Co-Chairs of IODE.

*438* Ms Iona expressed her appreciation for the election. She hoped to continue the successful work of IODE and reminded the Committee that this is the second time that Greece has provided an IODE Chair. She noted that the IODE community will face some difficult future challenges. In combination with the JCOMM DMCG of which she is also Chair she ensured the Committee that she would do her best to serve the IODE mission.

*439* Mr Troisi thanked the Committee for his election and confidence in leading IODE.

## 15. DATE AND PLACE OF IODE-XXII

*440* Mr Greg Reed invited the Committee to consider the date and place of the Twenty-second Session of the IODE Committee.

*441* The delegate of Mexico offered to investigate to host the next Session in Cancun, Mexico.

## 16. CLOSURE

*442* Mr Reed and Dr Bel Hassen Abid thanked the Committee for the support during the past four years which had been extremely productive. They also congratulated the incoming Co-Chairs with their election and wished them an equally productive time. Finally they thanked the local organizers and Secretariat for the excellent arrangements for the Session.

*443* Ms Iona and Mr Troisi thanked the Committee for their election and pledged to do their utmost to continue the important achievements of IODE.

*444* **The Committee thanked** the Government of Belgium, at the Federal, Walloon and Flanders levels for the support provided, as well as the local host and the Secretariat.

*445* The Session was closed at 14h45 on Saturday 26 March 2011.

ANNEX I

# AGENDA

**1. OPENING**

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

**3. INTRODUCTORY REPORTS**
- 3.1 CO-CHAIR'S REPORT
- 3.2 IMPLEMENTATION STATUS OF THE IODE-XX WORK PLAN
- 3.3 FINANCIAL AND IN-KIND CONTRIBUTION REPORT
- 3.4 INTRODUCTION TO WORK PLAN AND BUDGET

**4. NODC AND PROJECT OFFICE REPORTS**
- 4.1 REPORTS OF NODCS, DNAS AND MARINE INFORMATION CENTRES
- 4.2 REPORT OF THE IOC PROJECT OFFICE FOR IODE
  - **4.2.1 Renewal of the MoU for the IOC Project Office for IODE**

**5. ADOPTION BY IODE OF THE OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM (OBIS)**
- 5.1 INTRODUCTION
- 5.2 PROPOSED REVISION OF THE IODE STRUCTURE TO ACCOMMODATE OBIS
- 5.3 OBIS STRATEGY, MEDIUM AND LONG-TERM OBJECTIVES

**6. PROGRAMME ACTIVITY REPORTS**
- 6.1 GROUPS OF EXPERTS
  - **6.1.1 IODE Group of Experts on Biological and Chemical Data Management and Exchange (GE-BICH)**
  - **6.1.2 IODE Group of Experts on Marine Information Management (GE-MIM)**
  - **6.1.3 JCOMM/IODE Expert Team on Data Management Practices (ETDMP)**
- 6.2 PROJECTS
  - **6.2.1 JCOMM/IODE Ocean Data Standards**
  - **6.2.2 IODE OceanDataPortal**
    - *6.2.2.1 Cooperation with WMO/WIS*
    - *6.2.2.2 Cooperation with SeaDataNet*
  - **6.2.3 Data Publishing (SCOR/IODE)**
  - **6.2.4 Global Oceanographic Data Archaeology and Rescue (GODAR)**
  - **6.2.5 Global Temperature and Salinity Profile Programme (GTSPP)**
  - **6.2.6 Global Ocean Surface Underway Data Pilot Project (GOSUD)**
  - **6.2.7 Marine XML**
  - **6.2.8 Aquatic Sciences and Fisheries Abstracts (ASFA)**
  - **6.2.9 OceanDocs and Aquatic Commons**

**11. IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (2012–2015)**

**12. ANY OTHER BUSINESS**

**13. REQUIRED RESOURCES AND PLAN OF ACTION FOR 2010-2011 (CURRENT UNESCO BIENNIUM 2010–2011) AND 2012–2013 (NEXT UNESCO BIENNIUM)**

**14. ELECTIONS OF CO-CHAIRS**

**15. DATE AND PLACE OF IODE-XXII**

**16. CLOSURE**

ANNEX II

**RECOMMENDATIONS**

| | |
|---|---|
| Recommendation IODE-XXI.1: | THE UNESCO/IOC PROJECT OFFICE FOR IODE IN OSTEND, BELGIUM |
| Recommendation IODE-XXI.2: | ESTABLISHMENT OF THE IODE STEERING GROUP FOR OBIS (SG-OBIS) |
| Recommendation IODE-XXI.3: | ESTABLISHMENT OF THE IODE GROUP OF EXPERTS ON OBIS (GE-OBIS) |
| Recommendation IODE-XXI.4: | THE IODE OBJECTIVES |
| Recommendation IODE-XXI.5: | ESTABLISHMENT OF THE IOC PROJECT OFFICE FOR IODE/OBIS AT RUTGERS UNIVERSITY, N.J., USA |
| Recommendation IODE-XXI.6: | ESTABLISHMENT OF THE IODE STEERING GROUP FOR THE OCEANDOCS PROJECT |
| Recommendation IODE-XXI.7: | PROGRAMME AND BUDGET FOR 2011–2013 |

Recommendation IODE-XXI.1

**The UNESCO/IOC Project Office for IODE in Ostend, Belgium**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Recalling:**

(i) Resolution XXII-7 which accepted with appreciation the offer of the Government of Flanders and the city of Ostend to host the IODE Project Office,

(ii) Resolution XXII-1 which adopted the Guidelines for the Establishment of IOC Decentralized Offices, subsequently published in Document IOC/INF-1193,

**Noting with appreciation**:

(i) the positive results of the external review by UNESCO of the IODE programme and its IOC project Office for IODE (2002–2006), the positive assessment of the performance of the IOC Project Office for IODE by the IODE Committee during its nineteenth Session, and the positive outcome of the review of the performance of the IOC Project Office for IODE as part of the external review of the Flanders Marine Institute,

(ii) that the IOC Project Office for IODE has exceeded the expected implementation of its objectives:

- the successful development and hosting of data/information products/services such as web sites including the IOC web sites, IODE OceanDocs, IODE OceanExpert, IODE Ocean Data Portal
- the successful development and hosting of the training system OceanTeacher
- the successful training, between 2005 and end 2010, of over 800 participants in IODE related training courses at the Project Office, as well as the high appreciation expressed by students on the quality of the courses and the facilities
- the establishment of an excellent international meeting and conference centre,

(iii) the considerable financial support provided by the Government of Flanders (Belgium) to the IOC in general and to the IOC Project Office for IODE in particular, and the excellent in-kind support provided by the Flanders Marine Institute (VLIZ),

(iv) the complementary nature of the activities carried out at the Project Office and the financial support provided by the Government of Flanders (Belgium) through the UNESCO/Flanders Fund-in-Trust for the support of UNESCO's activities in the field of Science (FUST),

(v) the contribution by the IOC Project Office for IODE (as the IODE Secretariat and Meeting & Training Facility) to the further development of Ocean Data and Information Networks in developing regions,

(vi) the efficient and effective management of the Project Office and the professionalism of its Staff,

**Considering** that the Office in Ostend is now assisting fully in the implementation of the IODE Programme, including the regional implementation of the IODE Programme,

**Expressing its gratitude** to the Government of Flanders (Belgium) and the Flanders Marine Institute (VLIZ) for:

(i) the considerable support provided, both financially and by hosting of the Project Office, as from April 2005,

(ii) the offer to continue hosting and supporting the Office in Ostend, Belgium;

**Recommends** that:

(i) the IOC Project Office for IODE be continued;

(ii) the offer of the Government of Flanders (Belgium) to continue hosting the Office in Ostend be accepted;

(iii) the Memorandum of Understanding between UNESCO/IOC and the Government of Flanders (Belgium) through the Flanders Marine Institute (VLIZ) be renewed in accordance with the offer of the Government of Flanders (Belgium).

Recommendation IODE-XXI.2

**Establishment of the IODE Steering Group for OBIS (SG-OBIS)**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Noting** the great progress that has been made under the Global Census of Marine Life (CoML) Programme and that this ten-year initiative, to assess and explain the diversity, distribution and abundance of marine life in the oceans, concluded at the end of 2010,

**Recalling** the decision, through Resolution XXV-4, to accept OBIS within the IODE Programme, and the request to the IOC Executive Secretary to make the necessary administrative arrangements necessary for OBIS activities to continue under the auspices of IOC and its IODE Programme,

**Recommends** the establishment of an IODE Steering Group for OBIS with the following terms of reference:

- Advise the IODE Committee on the vision and mission for OBIS;
- Advise the IODE Committee on the strategy for OBIS sustainability and further development;
- Define and monitor the OBIS business plan;
- Assist the IOC Project Office for IODE/OBIS and IODE Committee with seeking funding for the sustained development of OBIS;
- Prepare, for submission to the IODE Committee, the work plan for the OBIS community on expanding the dataset and the toolset, on developing new information system products, and on addressing the issues on gaps, that will be implemented and monitored by the IOC Project Office for IODE/OBIS;
- Review progress of and guide the implementation of the work plan, taking into account emerging issues;
- Identify any technical or scientific issues as relevant to the implementation of the work plan and recommend these, as required, for action to the GE-OBIS through the IODE Committee;
- Agree on the sharing of responsibilities between members of the OBIS community;
- Manage, and recommend criteria, regarding the OBIS Node membership;

**Recommends** that the membership of the Steering Group shall include the managers of OBIS Nodes or their designated representatives, and representatives from organizations contributing to the development and maintenance of the OBIS infrastructure. The Steering Group will designate its own Chair, define rules and responsibilities of Nodes, and develop objective criteria for evaluation of membership. IODE Co-Chairs will be invited to attend the meetings.

Recommendation IODE-XXI.3

**Establishment of the IODE Group of Experts on OBIS (GE-OBIS)**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Noting** the great progress that has been made under the Global Census of Marine Life (CoML) Programme and that this ten-year initiative, to assess and explain the diversity, distribution and abundance of marine life in the oceans, concluded at the end of 2010,

**Recalling** the decision, through Resolution XXV-4, to accept OBIS within the IODE Programme, and the request to the IOC Executive Secretary to make the necessary administrative arrangements necessary for OBIS activities to continue under the auspices of IOC and its IODE Programme,

**Recommends** the formation of a Group of Experts on OBIS, to operate in close collaboration with all IODE Groups of Experts, and responding to the needs expressed by the IODE Steering Group for OBIS;

**Further recommends** that the tasks of the Group of Experts should include to improve, optimize and streamline the Ocean Biogeographic Information System by:

- shaping the evolution of the architecture to keep it state-of-the-art, fit for a wide range of users and interoperable with other relevant international data networks;
- providing advice on relevant new technologies, including visualization and analysis tools;
- promoting, selecting or developing standards for data format, data exchange and data synchronization;
- providing guidelines for data practices including QC, data capture, integration, citation, metadata generation for marine biodiversity;
- identifying needs and providing advice on training and education initiatives;

**Invites** the IOC Governing Bodies to support this Group of Experts;

**Encourages** IOC Member States to nominate experts having expertise in biogeographic and biodiversity data management and exchange to the Group of Experts;

**Requests** that the Group of Experts maintains close relations with GBIF and other relevant programmes;

**Further requests** that a progress report be submitted regularly to the IODE Officers and the IODE Committee.

Recommendation IODE-XXI.4

**The IODE Objectives**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Recalling** the revision of its objectives through Recommendation IODE-XVIII.1,

**Recalling further** the adoption through Resolution XXII-6 by IOC of the IOC Oceanographic Data Exchange Policy,

**Noting** the crucial importance of the IOC Oceanographic Data Exchange Policy for the free and open exchange of oceanographic data and information by the IODE,

**Recommends** that the Objectives of the IODE Programme be modified as follows:

(i) 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;

(ii) to ensure the long-term archival, management and services of all marine data and information;

(iii) 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;

(iv) to assist Member States to acquire the necessary capacity to manage marine data and information and become partners in the IODE network; and

(v) to support international scientific and operational marine programmes of IOC and WMO and their sponsor organizations with advice and data management services.

Recommendation IODE-XXI.5

**Establishment of the IOC Project Office for IODE/OBIS at Rutgers University, N.J., USA**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Noting** the great progress that has been made under the Global Census of Marine Life (CoML) Programme and that this ten-year initiative, to assess and explain the diversity, distribution and abundance of marine life in the oceans, will conclude at the end of 2010,

**Noting with appreciation** the offer by Rutgers University, N.J., U.S.A. to host the IOC Project Office for IODE/OBIS,

**Recalling** the decision, through Resolution XXV-4, to accept OBIS within the IODE Programme, the requests to the IOC Executive Secretary to: (i) make the necessary administrative arrangements necessary for OBIS activities to continue under the auspices of IOC and its IODE Programme, and (ii) to explore a formal agreement for the hosting of an

IOC Office for OBIS with the current host institution of the OBIS Secretariat at Rutgers University, N.J., U.S.A,

**Recalling further** the Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission and for the Establishment of Decentralized Offices as documented in IOC/INF-1193,

**Acknowledging:**

(i) the Proposal, submitted by the twenty-first Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE-XXI) to establish the IOC Project Office for IODE at Rutgers University, N.J., U.S.A.,

(ii) that the Proposal complies with the requirements defined in IOC/INF-1193,

**Decides** to accept the offer of Rutgers University, N.J., U.S.A. to host the IOC Project Office for IODE/OBIS;

**Decides** to establish the IOC Project Office for IODE/OBIS at Rutgers University, N.J., U.S.A. with the following Terms of Reference:

(i) to maintain and develop the Ocean Biogeographic Information System (OBIS), its network, the international OBIS portal and collective database with emphasis on improving the efficiency and effectiveness of the data and product/service stream;

(ii) to create an enabling environment, and assist in strengthening the capacity of constituent Nodes to manage biogeographic data and information and to provide biogeographic information products and services required by users;

(iii) to coordinate and monitor the implementation of the OBIS work plan as adopted by the IODE Committee;

**Requests** the IOC Executive Secretary to:

(i) establish a formal hosting agreement with Rutgers University, N.J., U.S.A.;

(ii) provide the necessary secretariat assistance to the IOC Project Office for IODE/OBIS, taking into account IOC/INF-1193;

**Urges** IOC Member States to actively participate in and financially support the Project Office and its activities, and to consider other ways to support the Project office, such as study attachments and secondments.

Recommendation IODE-XXI.6

**Establishment of the IODE Steering Group for the OceanDocs Project**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Recalling** the establishment of the IODE OceanDocs Project by the IODE Committee at its nineteenth Session through Recommendation IODE-XIX.11,

**Noting with appreciation** the successful development and use of the IODE OceanDocs Project as a free and open mechanism to make scientific literature available to all in an equitable way between the developed and developing world,

**Expresses its gratitude** to the Universiteit Hasselt, Belgium (UHasselt) for its considerable in-kind support that has enabled the development of OceanDocs;

**Recommends** the establishment of the IODE Steering Group for the OceanDocs Project with the following Terms of Reference:

(i) advise the Committee on the global policy and strategy, including partnerships of OceanDocs;

(ii) monitor the contributions by Member States to the OceanDocs e-repository and recommend ways and means to further promote OceanDocs and to increase its holdings;

(iii) monitor and consider appropriate new technologies to improve OceanDocs;

(iv) participate in the IODE/IAMSLIC Aquatic Commons Management Board;

**Recommends further** that the membership of the Steering Group shall initially include Belgium (UHasselt), Chair GE-MIM and representatives of ODINs contributing to OceanDocs.

Recommendation IODE-XXI.7

**Programme and Budget for 2011–2013**

The IOC Committee on International Oceanographic Data and Information Exchange,

**Having reviewed** its programme implementation requirements for the period 2011–2013,

**Being aware** of the continuing severe financial constraints faced by UNESCO and its IOC,

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

**Noting** the important role of IODE in JCOMM and the growing collaboration with, and contribution to other IOC programmes and activities, responding to the IOC Strategic Plan for Oceanographic Data and Information Management,

**Noting further** the adoption of the Ocean Biogeographic Information System (OBIS) by IODE,

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

**Appreciating** the in-kind support for the IODE Programme provided by Member States through establishing and maintaining IODE Data Centres, provision of experts, through the provision of valuable ocean data and information products and services, and through financial and in-kind contributions to IOC,

**Calls on** Member States to provide financial support to the IOC Trust Fund, earmarked for IODE, or in-kind support through the secondment of experts to the IOC Project Office for IODE or to the IODE secretariat;

**Invites** the IOC Executive Secretary to ensure stable and long-term staffing arrangements for the IODE Secretariat and for the IOC Project Office for IODE, with special attention to OBIS;

**Requests to** the IODE Co-Chairs to bring to the attention of the IOC Assembly at its Twenty-sixth Session, the IODE Programme and Budget for the period 2011–2013, as attached in the Annex to this Recommendation.

Annex to Recommendation IODE-XXI.7

IODE Programme and Budget for the period 2011–2013

| Project/Group | 2011 | | | 2012 | | | 2013 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | RP | EB PO | EB other | RP | EB PO | EB other | RP | EB PO | EB other | |
| OBIS | | | | | | | | | | |
| SG-OBIS meeting | | $36,000 | | | $36,000 | | | $36,000 | | Venue: IODE PO |
| GE-OBIS | | | | | $18,000 | | | | | Venue: IODE PO |
| Technical meeting | $7,000 | | | | | | | | | Venue: Rutgers |
| Science meeting | | $12,500 | | | | | | | | Venue: IODE PO |
| OBIS PO travel | | | $5,000 | | | $5,000 | | | $5,000 | IOC EB funds |
| OBIS staff cost | | | | | | | | | | To be identified |
| GE-BICH | | | | | | | | | | |
| 2nd GE-BICH Workshop QC/QC, ad hoc GE-BICH meeting | | | | | $30,000 | | | | | Venue: IODE PO |
| GE-BICH-VI | | | | | | | | $30,000 | | Venue: IODE PO |
| GE-MIM | | | | | | | | | | |
| GE-MIM-XII | $10,000 | | | | | | | | | Venue: IODE PO; Sep 2011 |
| ETDMP | | | | | | | | | | |
| Meeting ETDMP-III | | $10,000 | | | | | | | | WMO resources pending decision by Cg-XVI; venue: IODE PO; Oct 2011 |
| Meeting ETDMP-IV | | | | | | | | $10,000 | | WMO resources pending decision by Cg-XVI; venue: IODE PO; Oct 2013 |
| ETDMP/ODS | | | | | | | | | | |

| Project/Group | 2011 | | | 2012 | | | 2013 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | RP | EB PO | EB other | RP | EB PO | EB other | RP | EB PO | EB other | |
| Report ODS to ETDMP | | $3,000 | | | | | | $3,000 | | Venue: IODE PO; Oct 2011 |
| Meeting ODS pilot project | | $15,000 | | | $15,000 | | | | | WMO resources pending decision by Cg-XVI; venue: IODE PO; Nov 2011 |
| Participation in meetings to promote ODS | $5,000 | | | $5,000 | | | | | | WMO resources pending decision by Cg-XVI; Dec 2011 |
| ETDMP/ODP | | | | | | | | | | |
| ODP v2 development | | | | $10,000 | | | | | | |
| ODP node Argentina | $5,000 | | | | | | | | | |
| ODP node ODINAfrica | | | | $5,000 | | | | | | |
| ODP node ODINCARSA LA | | | | | | | $5,000 | | | |
| Data Publishing | | | | | | | | | | |
| Meeting | | $5,000 | $5,000 | | | | | | | EB SCOR; venue: Paris or Ostend |
| GODAR | | | | | | | | | | |
| 1 visits to NODC/WDC | $5,600 | | | $5,600 | | | $5,600 | | | |
| GTSPP | | | | | | | | | | |
| Data user guide | $5,000 | | | | | | | | | |
| SG-GTSPP | | | | | $10,000 | | | | | Venue: IODE PO; May 2012 |
| Training materials in OTA | | | | $5,000 | | | | | | |
| DM Training Course | | | | | $7,000 | | | $7,000 | | 2 persons travel to Ostend |
| Database system manual | | | | | | | $5,000 | | | |
| ASFA | | | | | | | | | | |
| ASFA Advsory Board meeting | $3,000 | | | $3,000 | | | $3,000 | | | venue tbd |
| OceanDocs/ Aquatic Commons | | | | | | | | | | |
| SG-OceanDocs meeting | | $20,000 | | | | | | | | venue: IODE PO; Jun-Sep 2011 |
| OceanDocs startup meeting | | $10,000 | $10,000 | | | | | | | VOA3R: contributes US$ 10000 |
| Updating software | | $5,000 | $5,000 | | | | | | | VOA3R: contributes US$ 5000 |
| Software development | | $3,000 | | | $3,000 | | | $3,000 | | IAMSLIC: US$ 3K/year |
| ODINCARSA | | | | | | | | | | |
| Expert visits | | | | $3,000 | | | | | | |
| Training events x 2 | | $28,000 | | | $28,000 | | | $28,000 | | at PO 2011-back to back with SPINCAM? (tbd) |
| Coordination meeting | | $15,000 | | | | | $15,000 | | | |

| Project/Group | 2011 | | | 2012 | | | 2013 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | RP | EB PO | EB other | RP | EB PO | EB other | RP | EB PO | EB other | |
| Expert visits | | | | $3,000 | | | $3,000 | | | |
| MIM OceanDocs support | $7,400 | | | $7,400 | | | $7,400 | | | |
| Participation in IAMSLIC conferences | $5,000 | | | $5,000 | | | $5,000 | | | IAMSLIC? |
| IAMSLIC membership sponsoring | $200 | | | $200 | | | $200 | | | |
| ODINECET | | | | | | | | | | |
| Coordination meeting | | $20,000 | | | $20,000 | | | $20,000 | | Venue: IODE PO |
| Technical support | $1,200 | | | $1,200 | | | $1,200 | | | |
| Provision of equipment | $2,500 | | | $2,500 | | | | | | |
| Meeting of Russian Librarians | | | | | | $8,000 | | | | EB:IAMSLIC |
| ODINWESTPAC | | | | | | | | | | |
| Coordination meeting | $25,000 | | | | | | $25,000 | | | |
| DM Training Course | | | | $20,000 | | | | | | |
| ODINBLACKSEA | | | | | | | | | | |
| Coordination meeting | | $9,000 | | | $9,000 | | | $9,000 | | Venue: IODE PO |
| ODINPIMRIS | | | | | | | | | | |
| Review meeting/training | $16,000 | | | | | | | | | Suva |
| Equipment support | | $5,000 | | | | | | $5,000 | | scanners, computers, digitizing, |
| Country visits | $5,000 | | | | | | | | | |
| Scholarship programme | | $2,000 | | | $2,000 | | | | | USP |
| Coordination meeting | | | | | | | | $15,000 | | |
| Training | | | | | $4,000 | | | | | information management skills |
| Collection conversion | | | | | | | | $10,000 | | digitization project |
| Travel cost IODE-XXII | | | | | | | $5,000 | | | |
| IOC Strategic Plan | | | | | | | | | | |
| IWG meeting | | $20,000 | | | | | | | | |
| IODE-XXII | | | | | | | | | | |
| Staff travel and organization costs | | | | | | | $20,000 | | | |
| General costs | | | | | | | | | | |
| Admin costs general | $15,000 | | | $15,000 | | | $15,000 | | | |
| Staff travel | $10,000 | | | $10,000 | | | $10,000 | | | |
| | | | | | | | | | | |
| TOTALS | $127,900 | $218,500 | $25,000 | $100,900 | $182,000 | $13,000 | $125,400 | $176,000 | $5,000 | |
| Available from RP | $90,000 | | | $97,750 | | | $97,750 | | | |
| Available from IOC EB | | | $5,000 | | | $45,000 | | | $45,000 | |
| Balance to finance | $37,900 | | | $3,150 | | | $27,650 | | | |

ANNEX III

# LIST OF PARTICIPANTS

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ANNEX IV

**OPENING ADDRESS BY DR DOMINIQUE FONTEYN ON BEHALF OF MR PHILIPPE METTENS, CHAIRMAN OF THE BOARD OF DIRECTORS OF THE BELGIAN SCIENCE POLICY OFFICE (BELSPO)**

Respected Co-Chairs,
Distinguished Delegates,
Dear Colleagues,
Ladies and Gentlemen,

It is a pleasure for me to welcome you here today in Liège on behalf of the Belgian Federal Government for the 21st session of the International Oceanographic Data and Information Exchange programme (IODE).

Ladies and gentlemen, our seas and oceans, which cover over more than 70% of the Earth's surface, are crucial for our societies. Half of the global oxygen production is derived from the oceans. They are the main drivers of the Earth's climate, they are also a critical source of food, energy and mineral resources as well a crucial way for transporting our goods and products.

For several decades the marine ecosystems have been under significant impact from human activities at sea and from land.

The sustainable development of our society will largely depend on how successful we are in establishing a sustainable management of our seas and oceans. However, such management is only possible if it receives adequate scientific support.

This implies that the results of research activities, in other words the collected data and the information derived therefrom must be made available in a structured way not only to the policy makers, but also to the various other actors in the field: scientists, the commercial sector, marine resource managers, ...

The pooling and exchange of research data will help in reducing the uncertainty in knowledge of our oceans and seas and thus provide a better support to management policies. It will also provide opportunities to the users of marine data to innovate. And last but not least data exchange will reduce the operational costs since the economic benefit of collecting the data by sharing as opposed to collecting it oneself is huge.

Ladies and gentlemen, since half a century the IOC and its IODE programme have facilitated and promoted the exchange of marine data and information; develop standards, formats and methods for this exchange and provide capacity building in ocean data management. The IOC and IODE play a crucial role in the international cooperation in ocean sciences and in the "science" of ocean data management in particular.

Belgium attaches great importance to IOC and its programmes and to marine research activities in general. The hosting of the international conference commemorating the 50th anniversary of IODE and its 21st session underlined this.

In this context, allow me to mention the role of the Belgian Science Policy Office (BELSPO).

My administration has been coordinating and implementing marine research programmes for over 40 years. Currently, more than 30 projects are financed in the field of marine research, on the North Sea, on Antarctica, on climate change, etc. For those researches, amongst

others, our oceanographic research vessel Belgica is made available for the whole Belgian and international marine research community.

BELSPO counts also 10 prestigious federal institutions within its structure and I take the opportunity to mention especially one of them: "the Royal Belgian Institute of Natural Sciences" and its department "the Management Unit of the Mathematical Models of the North Sea" which is hosting our Belgian Marine Data Centre and which is the local organiser of this 21st session.

The Belgian Science Policy Office included our Federal Institutions will pursue our long tradition in support of marine research and thus building further towards a sustainable management of our seas and oceans.

To conclude I wish you all a productive 21st IODE session and a pleasant stay in Liège.

Thank you for your attention.

Thank you!

ANNEX V

## LIST OF DOCUMENTS

## Agenda Documents

| Agenda # | Code | Title |
|---|---|---|
| 2.1 | IOC/IODE-XXI/1 prov. | Provisional Agenda |
| 2.3 | IOC/IODE-XXI/1 add. prov. | Provisional Timetable |
| 2.3 | IOC/IODE-XXI/2 | ACTION PAPER |
| 2.3 | IOC/IODE-XXI/2add.1 | ADDENDUM 1 TO DOCUMENT IOC/IODE-XXI/2 |
| 2.3 | IOC/IODE-XXI/4 | Provisional List of Documents |
| 3.2 | INF-1272 | 2010 IODE Officers Meeting: Summary Report |
| 3.2 | IOC/IODE-XXI/7 | Implementation status report of the IODE-XX work plan |
| 4.1 | IOC/IODE-XXI/9 | Reports of the NODCs, DNAs and Marine Information Centres |
| 4.2 | IOC/IODE-XXI/11 | Report of the IOC project Office for IODE (06/01/11 [Download]) |
| 4.2.1 | IOC/IODE-XXI/42 | Renewal of the MOU between the Flanders Marine Institute (VLIZ) and IOC regarding the IOC Project Office for IODE, Ostend, Belgium |
| 4.2.1 | IOC/IODE-XXI/42add. | Amendment: Renewal of the MOU between the Flanders Marine Institute (VLIZ) and IOC regarding the IOC Project Office for IODE, Ostend, Belgium |
| 5 | IOC/IODE-XXI/43 | Adoption by IODE of the Ocean Biogeographic Information System (OBIS) |
| 5 | IOC/IODE-XXI/44 | Establishment of an IOC Project Office for the Ocean Biogeographic Information System (OBIS) |
| 5.2 | IOC/INF-1193 | Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission and for the Establishment of Decentralized Offices |
| 6.1.1 | IOC/IODE-XXI/12 | Report of the IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GE-BICH) |
| 6.1.2 | IOC/IODE-MIM-XI/5rev. | IOC Communication Strategy for Marine Information Management 2010-2012 |
| 6.1.2 | IOC/IODE-XXI/13 | IODE GE-MIM |
| 6.1.3 | IOC/IODE-XXI/14 | Report on Inter-Sessional Activities of the ETDMP |
| 6.2.1 | IOC/IODE-XXI/15 | IODE/JCOMM Ocean Data Standards (ODS) |
| 6.2.2 | IOC/IODE-XXI/16 | IODE Ocean Data Portal |
| 6.2.2 | JCOMM Technical Report No. 48 | Pilot Project For The Integration Of Marine Meteorological And Other Appropriate Oceanographic Observations Into The WMO Integrated Global Observing System (Wigos). WIGOS Pilot Project V - JCOMM Pilot Project for WIGOS. Project Report |
| 6.2.3 | IOC/IODE-XXI/17 | SCOR/IODE/MBLWHOI Library Project on Data Publication |
| 6.2.4 | IOC/IODE-XXI/18 | GODAR Project Report |
| 6.2.5 | IOC/IODE-XXI/19 | Global Temperature and Salinity Profile Programme (GTSPP) |
| 6.2.6 | IOC/IODE-XXI/20 | GOSUD report for 2009-2010 |
| 6.2.7 | IOC/IODE-XXI/21 | Report of the MarineXML Steering Group |
| 6.2.8 | IOC/IODE-XXI/22 | Aquatic Sciences and Fisheries Abstracts (ASFA) |
| 6.2.9 | IOC/IODE-XXI/23 | OceanDocs and Aquatic Commons |
| 6.2.10 | IOC/IODE-XXI/24 | OceanExpert |
| 6.2.11 | IOC/IODE-XXI/25 | OpenScienceDirectory (2008-2010) |
| 7.1 | IOC/IODE-XXI/26 | OceanTeacher and Training Activities |
| 7.2.1 | IOC/IODE-XXI/27 | ODINAFRICA Progress Report |
| 7.2.2 | IOC/IODE-XXI/28 | Ocean Data And Information Network for the Caribbean And Latin America - ODINCARSA-LA |
| 7.2.4 | IOC/IODE-XXI/30 | Ocean Data and Information Network for European Countries in Economic Transition (ODINECET) |
| 7.2.5 | IOC/IODE-XXI/31 | ODINWESTPAC Progress Report 2009-2010 |
| 7.2.6 | IOC/IODE-XXI/32 | ODIN-BlackSea |
| 7.2.7 | IOC/IODE-XXI/33 | Regional Network of Pacific Island Marine Libraries (ODIN-PIMRIS) |
| 7.3 | IOC/IODE-XXI/45 | Proposal to Establish an International Training Centre for Operational Oceanography (ITCOocean) |
| 8.2 | IOC/IODE-XXI/36 | Development of a new ICSU World Data System and its relationship with IODE |
| 8.3 | IOC/IODE-XXI/35 | JCOMM ad hoc Task Team on RNODCs and SOCs |
| 10.2 | IOC/IODE-XXI/41 | 50TH ANNIVERSARY OF IODE IN 2011 |

## Other Documents

| Code | Title |
|---|---|
| IOC Circular Letter No. 2358 | Twenty-First Session Of The IOC Committee On International Oceanographic Data And Information Exchange (IODE-XXI), Liege, Belgium, 23-26 March 2011 - Invitation |
| IODE-XXI Working Document Template | |
| IOC Circular Letter No. 2336 | Nomination And/Or Updating Of Information On IODE National Coordinators For Marine Information Management (And Oceanographic Data Management) |

ANNEX VI

## IODE-XXI (2011–2013) ACTION SHEET

| No | Para | Action item | Due by date | To be implemented by |
|---|---|---|---|---|
| 1 | 36-37 | The delegate of China, Prof. Lin Shaohua informed the Committee that China is considering seconding one or two experts to the IODE Project Office between 2011–2013.<br><br>**The Committee thanked** China for this kind offer and **instructed** the Secretariat to discuss the administrative arrangements with China. | 2011 | Secretariat / China |
| 1 | 51 | **The Committee instructed** the Secretariat to make the following modifications in the survey mechanism for the next Session: (i) ensure that a PDF version of the survey is available online; (ii) ensure that a PDF version is generated after filling the online survey; (iii) provide a quantitative and trend analysis (including maps and charts) of the results as compared to previous inter-sessional periods; (iv) indicate whether distributed data centres respond faster or slower than centralized data centres; and (v) examine responses looking for patterns based on type of data centre (centralized or distributed), by region, or ease of connection to the Internet. It was noted that in the case of distributed centres it may be difficult to provide accurate aggregated information. | Prior to IODE-XXII | Secretariat |
| 3 | 71 | **The Committee adopted** Recommendation IODE-XX1.1 (The UNESCO/IOC Project Office for IODE in Ostend, Belgium). | Sub-sequent to IOC-XXVI | Secretariat |
| 4 | 81 | **The Committee adopted** Recommendation IODE-XXI.2 (Establishment of the IODE Steering Group for OBIS (SG-OBIS)) and Recommendation IODE-XXI.3 (Establishment of the IODE Group of Experts on OBIS (GE-OBIS)). | Sub-sequent to IOC-XXVI | Secretariat |
| 5 | 84 | **The Committee adopted** Recommendation IODE-XXI.4 (The IODE Objectives). | Sub-sequent to IOC-XXVI | Secretariat (update web site) |
| 6 | 86 | **The Committee adopted** Recommendation IODE-XXI.5 (Establishment of the IOC Project Office for IODE/OBIS at Rutgers University, N.J., U.S.A). | Sub-sequent to IOC-XXVI | |
| 7 | 88 | **The Committee instructed** the Secretariat to prepare the additional required documentation as described in INF-1193 and to **submit** these, together with the relevant Recommendations to the next Session of the IOC Assembly. | Prior to IOC-XXVI | Secretariat |

| No | Para | Action item | Due by date | To be implemented by |
|---|---|---|---|---|
| 8 | 98 | **The Committee urged** GE-BICH to explore further collaboration with other projects, such as the SeaDataNet 2, which will have a strong biological component. | 2011-… | Co-Chair GE-BICH; IODE Co-Chairs |
| 9 | 107 | **The Committee decided** to include more MIM elements in the next version of the IOC Strategic Plan for Oceanographic Data and Information Management | 2012 | Working Group |
| 10 | 112 | **The Committee encouraged** GE-MIM to enhance its collaboration with ODIN's in order to strengthen activities at the regional level. | 2011-2013 | GE-MIM and ODIN coordinators |
| 11 | 114 | **After considering** Document IOC/IODE-MIM-XI/5rev. **the Committee instructed** the Secretariat to publish the "IOC Communications Strategy for Marine Information Management" in the relevant IOC series. | 2011 | Secretariat |
| 12 | 136 | **The Committee urged** national experts to actively participate in the pilot project by submitting proposals and by reviewing proposals – especially now for the quality flag proposal as this will have implications for all data centres. | 2011-2013 | National experts |
| 13 | 162 | **The Committee welcomed** the intentions of SeaDataNet-2 to include IODE as a direct partner in SeaDataNet-2, and **urged** SeaDataNet to collaborate with the IODE Project Office to ensure pertinent training material and other documentation should become part of the OceanTeacher resources. | 2011-2013 | SeaDataNet management |
| 14 | 167 | **The Committee suggested** that information on the planned meeting be widely distributed to encourage wider participation by IODE centres in this work | 2011 | Project management |
| 15 | 184 | **The Committee recommended** to GTSPP, and other relevant IODE projects that are mentioned in the GCOS IP to include a section in its reports that explicitly identifies activities that address GCOS actions. | 2011-2013 | Project coordinators |
| 16 | 193 | **The Committee recommended** that national representatives support the project by distributing this report in their country and to identify potential contributors either by providing data to the project or by providing scientific or data management expertise that could enhance the quality of the GOSUD dataset and /or enlarge the network. First priority should be given to data derived from research vessels or merchant ships that operate on regular lines. | 2011-2013 | National representatives |

| No | Para | Action item | Due by date | To be implemented by |
|---|---|---|---|---|
| 17 | 201 | **The Committee urged** national experts to register in the SeaVox mailing list through contacting Dr Lowry. | 2011 | National experts |
| 18 | 202 | **The Committee instructed** the chair of ETDMP, working closely with GE-BICH and as appropriate with the above noted groups, to determine the most appropriate mechanism for taking over the work of the SG-XML. This would include preparing Terms of Reference for the Pilot Project, changing the status of the project to a permanent status, and determining which of the ETDMP Task Team for ODS or the ETDMP Task Team for Metadata was the most appropriate group to carry the work forward. It was recalled that the ETDMP is a joint JCOMM/IODE body so decisions should be approved both by JCOMM and IODE. The Committee was informed that the next JCOMM Management Committee is scheduled for September 2011. The conclusions and recommendations by the ETDMP could be considered by the Management Committee at that time. Consequently, the work described should be completed before September, 2011 | 2011 | Chair ETDP/ Co-Chairs GE-BICH |
| 19 | 203 | **The Committee decided** to abolish the IODE Steering Group for Marine XML. | 2011 | Secretariat (Update IODE web site) |
| 20 | 221 | The delegate from France informed the Committee that France had performed an inventory of publications prepared after French scientific research cruises. The inventory is available in electronic form, and France is willing to share it with OceanDocs. **The Committee accepted** the kind offer. | 2011 | France/ SG-OceanDocs |
| 21 | 223 | **The Committee adopted** Recommendation IODE-XXI.6 (Establishment of the IODE Steering Group for the OceanDocs Project). | 2011 | |
| 22 | 228 | **The Committee proposed** that the over 4000 institutions referred to in the OceanExpert database should be linked to the SeaDataNet EDMO codes. | 2011-2012 | SeaDataNet management/ Secretariat/GE-MIM |
| 23 | 230 | **The Committee congratulated** the GE-MIM with the progress made in the further development of OceanExpert and **instructed** the GE-MIM to further investigate the use of OceanExpert as a unique researcher ID server. | 2011-2012 | Secretariat/GE-MIM |
| 24 | 243 | **The Committee remarked** the need for more Member States to contribute to OceanTeacher, namely as content providers, and **asked** for | 2011-2012 | SG-OceanTeacher (guidelines) |

| No | Para | Action item | Due by date | To be implemented by |
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| | | clarification on guidelines on how to provide those contributions. | | |
| 25 | 244 | **The Committee recognized** the importance of the already existing training materials produced by SeaDataNet and **invited** SeaDataNet to work with the IODE Project Office to ensure these are entered in OceanTeacher. | 2011-2012 | SeaDataNet management/ SG-OceanTeacher |
| 26 | 247 | **The Committee instructed** the Steering Group for OceanTeacher to investigate possibilities for making the digital library and/or the classroom available in offline version. | 2011-2012 | SG-OceanTeacher |
| 27 | 248 | **The Committee**, taking into account the needs of start-up data and information centres, **instructed** the Steering Group for OceanTeacher to consider developing case-study materials as well as step-by-step training materials (e.g. for the setting up of databases). | 2011-2012 | SG-OceanTeacher |
| 28 | 254 | **The Committee commended** ODINAFRICA on their accomplishments and **encouraged** the Member States to explore the possibility of providing the expertise [*for development of scenarios, forecasts and predictions, as well as "outreach and communication tools*"] required. | 2011-2013 | ODINAFRICA partners + ODINCARSA-LA partners |
| 29 | 255 | The Committee was informed that ODINAFRICA will be holding a Symposium on the Contribution of Ocean Data and Information Management to Sustainable Development, 4-6 October 2011, Saly, Senegal. **The Committee urged** ODINAFRICA participating countries as well as other IOC Member States to participate actively in the event | 2011 | IOC Member States |
| 30 | 265 | **The Committee commended** ODINCARSA for developing a work plan that included performance indicators and **requested** that all the ODIN's prepare similar work plans for future sessions of the Committee. | IODE-XXII | ODIN coordinators |
| 31 | 266 | **The Committee approved** the ODINCARSA work plan, | 2011-2013 | ODINCARSA-LA partner countries |
| 32 | 269-270 | The delegates of India and Thailand confirmed their willingness to support any activities to revive ODINCINDIO, including the organization of a meeting of representatives from the region during the 26th session of the IOC Assembly. **The Committee instructed the Secretariat** to make the arrangements for this meeting.<br>**The Committee designated** India as the Interim Coordinator for ODINCINDIO. | IOC-XXVI | Secretariat |
| 33 | 277 | **The Committee approved** the ODINECET work plan | 2011-2013 | ODINECET partner countries |

| No | Para | Action item | Due by date | To be implemented by |
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| 34 | 283 | **The Committee requested** the IODE Project Office and the secretariat for the IOC's Sub Commission for WESTPAC to assist in getting the Member States from the region to identify/confirm the national focal points for data and information management to reconstitute the coordination working group for the ODINWESTPAC | 2011 | Secretariat/ ODINWESTPAC coordinator |
| 35 | 284 | **The Committee approved** the ODINWESTPAC work plan | | |
| 36 | 290 | **The Committee stressed** the need to ensure that the ODIN-Black Sea products can be accessed through the ODIN-BlackSea website | 2011-2013 | ODIN-BlackSea coordinator |
| 37 | 291 | **The Committee approved** the work plan… | 2011-2013 | ODIN-BlackSea partner countries |
| 38 | 299 | **The Committee approved** the planned organization of a regional coordination meeting to review the progress in implementation of activities in the region, and **agreed** on a work plan for the coming inter-sessional period… | 2011-2013 | ODIN-PIMRIS partner countries |
| 39 | 315 | The delegate from France offered support and willingness to collaborate, since it already possesses know-how in the field of operational oceanography. This collaboration can be in the form of training materials as well as sending trainers occasionally. | 2011-2013 | France/INCOIS |
| 40 | 319 | **The Committee strongly welcomed** the initiative of India and **called** on the Assembly to accept the offer, **stressing** that the proposed Centre complies with the IOC Capacity Development Strategy which focuses on self-driven initiatives, and that the Centre will contribute substantially to the region's capacity in operational oceanography and related data and information management. **The Committee further welcomed** the proposed close collaboration between the Centre and IODE's OceanTeacher | IOC-XXVI | |
| 41 | 324 | **The Committee decided** that:<br>(iv) both the top-down and the bottom-up approach should be continued;<br>(v) that surveys to ascertain training needs be conducted prior to the IODE committee meetings and these surveys be incorporated in the national surveys prepared prior to IODE Committee Sessions, and that the results be presented at the IODE Committee Sessions;<br>(vi) that the surveys should be organized in October/November to allow time for any | 2011-2013 | Secretariat/ Sg-OceanTeacher/ ODIN coordinators |

| No | Para | Action item | Due by date | To be implemented by |
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| | | required national consultation on the requested information; | | |
| 42 | 325 | **The Committee further instructed** the Secretariat to undertake a survey of potential clients of the training courses to find out their numbers (and demography) and what percentage have benefited from the training. | 2011-2012 | Secretariat |
| 43 | 326 | **The Committee further identified** the need for preparing a long term (5 years) training plan and **tasked** the IODE Steering Group for OceanTeacher to carry out this work. | 2011-2012 | SG-OceanTeacher |
| 44 | 328 | **The Committee recommended** that key operational manuals focused on capacity building and hosted by the IOC/IODE should be updated using the best technological method available (possibly wiki technology), within a committee-led editing and review structure and expanded to include best practice guidelines and case studies. | 2011-2012 | Secretariat/ SG-OceanTeacher |
| 45 | 335 | **The Committee expressed its appreciation** for the offer by China [*to also establish an IODE regional training centre* ] and **instructed** the Secretariat to discuss this matter further and to make the necessary arrangements to facilitate the establishment of the training centre. | 2011-2012 | Secretariat/ China |
| 46 | 338 | **The Committee requested** the IODE Co-Chairs to contact Dr Albert Fischer at the IOC Secretariat to inquire if another data management expert from IODE would be considered for an invitation to the next OOPC meeting. | 2011 | Secretariat |
| 47 | 339-340 | Following the example of IPY and SCAR**, the Committee recommended** that papers should be presented at scientific conferences describing where data are archived and how they are available through the IODE system. **The Committee recommended** that papers on IODE be submitted for the IPY and SCAR conferences planned for 2011. | 2011-2013 | all |
| 48 | 357-358 | **The Committee adopted** the statement as attached as **Annex VI**.<br><br>**The Committee established** an inter-sessional working group. The terms of reference of the Group were defined as "*Description of the new IODE data and information system and its linkages with other systems (one part will focus on WDS)*". It was noted that the Group would also deal with the revision of the IOC Strategic Plan for Oceanographic Data and Information management. The membership was discussed under Agenda Item 11. | 2011-2012 | Inter-sessional working group |

| No | Para | Action item | Due by date | To be implemented by |
|---|---|---|---|---|
| 49 | 365 | **The Committee approved** the proposal and requested the *ad hoc* Task Team to draft a Recommendation for JCOMM-IV, including ToR of such centres, as well as background information and requested the Chair of JCOMM DMCG to keep the Committee informed of progress on the integration of these centres. | 2011 | Ad hoc Task team |
| 50 | 370 | **The Committee established** an inter-sessional working group that will "*identify a set of quality management criteria for IODE NODCs taking into account those defined for the WDS*". The initial membership of the Group will include Argentina, Australia, Belgium (both NODCs), Canada, Chile, China, France, Germany, Greece, India, Japan, Korea, Mexico, The Netherlands, Russian Federation, Tanzania, Turkey, Ukraine (both NODCs), United Kingdom, United States. This group will communicate by email. **The Committee designated** Mr Greg Reed (Australia) to lead the work of the Group. | 2011-2012 | Inter-sessional working group |
| 51 | 378 | **The Committee welcomed** the cooperation between IODE's OceanTeacher and POGO, and **recommended** that the cooperation be formalized, possibly through a MoU. | 2011 | Secretariat/ POGO |
| 52 | 393 | **The Committee welcomed** the cooperation with EUMETSAT through joint training courses and **recommended** the creation of a discussion forum and possibly to organize a meeting involving EUMETSAT, ODIN coordinators/technical experts and ODP technical experts to further discuss the possible cooperation between EUMETSAT and IODE. | 2011-2012 | Secretariat/ EUMETSAT |
| 53 | 400 | **The Committee expressed concern** about the 16% of respondents who answered "don't know" and the 23% who answered "no" and **noted** that answers like "don't know" possibly resulted from partial application of the Policy whereas the "no" could possibly refer to non-IOC programmes. **The Committee instructed** the Secretariat to contact Member States who answered "don't know" and "no" in order to qualify their answer. **The Committee also instructed** the Secretariat to improve the survey further by including comment boxes in the cases of "no" and "don't know" answers. | 2011-2013 | Secretariat |
| 54 | 407 | The Committee was informed that a QC manual had been received from MyOcean which had been offered for publication by IODE in the IOC Manuals and Guides series. **The Committee requested** the Secretariat to publish this document as soon as possible. | 2011 | Secretariat |

| No | Para | Action item | Due by date | To be implemented by |
|---|---|---|---|---|
| 55 | 417 | **The Committee decided** that the Proceedings of the IODE 50th anniversary international conference should be published including the full papers as well as extended abstracts for posters. **The Committee requested** Greece to take the role of Editor of the Proceedings. The Proceedings should be published before the end of 2011. | 2011 | Secretariat/ Greece |
| 56 | 422-423 | **The Committee established** an inter-sessional working group, which will have the objective of updating the Strategic Plan. This will include the description of a new IODE data and information system and its linkages with other systems (one part will focus on WDS). (see also Agenda Item 8.2). **The Committee requested** that the results of OceanObs'09 would be taken into account.<br><br>**The Committee decided** that the initial membership will include Argentina, Australia, Barbados, Belgium (both NODCs), China, Germany, Greece, India, The Netherlands, Russian Federation, Ukraine (both NODCs) United States, Chair GE-MIM, Chair GE-BICH, Chair GE-OBIS, Chair ETDMP, Chair JCOMM DMCG. The Group will be led by Australia with assistance from the United Kingdom. | 2011-2012 | Membership |
| 57 | 424 | The deadline to complete the work is March 2012. It was decided that a meeting will be required to compose the document. Member States were invited to self-fund their participation. | 2011-2012 | Secretariat/ Member States |
| 58 | 431 | **The Committee instructed** the Co-Chairs to bring to the attention of the IOC Assembly again the need to diversity the sources of extra-budgetary funding, recalling that 90% of the extra-budgetary funding for IODE (excluding OBIS) is still provided by one Member State (Government of Flanders, Belgium). | 2011 | Co-Chairs |
| 59 | 431 | **The Committee also reiterated** its request to Member States to second experts to the IOC Project Office for IODE, to ensure that the necessary expertise is available there. Alternative Member States could assist IODE by hosting regional events such as training courses and co-funding participants. | 2011-2013 | Member States |
| 60 | 432 | Referring to the adoption by IOC of OBIS within IODE, **the Committee urged** Member States to provide additional financial and in-kind support, and **called on** the UNESCO Director-General to create a Professional Position for the OBIS Programme Specialist, in order to ensure the long-term sustainability of this important new IOC/IODE activity. | 2011-2013 | Member States |

| No | Para | Action item | Due by date | To be implemented by |
|---|---|---|---|---|
| 61 | 433 | **The Committee adopted** Recommendation IODE-XXI.7 | 2011-2013 | all |

ANNEX VII

**IODE STATEMENT ON THE IODE ROLE IN THE ICSU WORLD DATA SYSTEM (WDS)**

1- At its twenty-first Session, the IOC Committee on International Oceanographic Data and Information Exchange (IODE) considered the role of the IODE in the ICSU World Data System.

2- The IODE Committee noted that "the WDS concept aims at a transition from existing stand-alone WDCs and individual Services to a common globally interoperable distributed data system, that incorporates emerging technologies and new scientific data activities. The new system will build on the potential offered by advanced interconnections between data management components for disciplinary and multidisciplinary applications."

3- The IODE is a specialized global network of data and information centres with the following objectives:

(i) 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;

(ii) to ensure the long term archival, management and services of all marine data and information;

(iii) 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;

(iv) to assist Member States to acquire the necessary capacity to manage marine data and information and become partners in the IODE network; and

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

4- The IODE has been active for 50 years and now comprises 80 National Oceanographic Data Centres in 78 Member States;

5- The IODE has developed standards, guidelines, methodologies and technologies that greatly enhanced the efficiency of exchange of data and information;

6- There is a long history of collaboration of the IODE network and the ICSU World Data Centres for Oceanography (*inter alia*) and IODE stresses the importance of products such as the World Ocean Atlas and World Ocean Database, as well as the collaborative activities such as GODAR (Global Oceanographic Data Archaeology and Rescue) which has rescued and preserved millions of historical data sets.

7- IODE expresses its strong interest in sharing its network, expertise, data and information with the ICSU World Data System

8- IODE offers its expertise to further develop the marine component of the ICSU WDS through application of IODE methodologies and technologies, and invites ICSU to discuss cooperation within a mutually agreed timeframe.

ANNEX VIII

## LIST OF ACRONYMS

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|---|---|
| AAAS | American Association for the Advancement of Science |
| AGORA | Access to Global Online Research in Agriculture |
| AMA | African Marine Atlas |
| AOML | Atlantic Oceanographic and Meteorological Laboratory (NOAA) |
| ASCLME | Agulhas Somali Current Large Marine Ecosystem project |
| ASFA | Aquatic Sciences & Fisheries Abstracts |
| BCLME | Benguela Current Large Marine Ecosystem project |
| BCO-DMO | Biological and Chemical Oceanography Data Management Office (US NSF) |
| BIOS | Bermuda Institute of Ocean Sciences |
| BODC | British Oceanographic Data Centre |
| CASPINFO | Caspian Sea Environmental and Industrial Data & Information Services |
| CBD | Convention on Biodivrsity |
| CCHDO | CLIVAR & Carbon Hydrographic Data Office |
| CCLME | Canary Current Large Marine Ecosystem project |
| CDI | Common Data Index (SeaDataNet) |
| CEEMaR | Central and Eastern European Marine Repository |
| CEMAGREF | L'institut de recherche en sciences et technologies pour l'environnement |
| CEOE | College of Earth, Ocean and Environment |
| CLIVAR | WCRP Climate Variability and Predictability project |
| CMA | Caribbean Marine Atlas |
| CODATA | Committee on Data for Science and Technology (ICSU) |
| CoML | Census of Marine Life |
| COP | Conference of Parties |
| CRC | Cyclical Redundancy Check |
| CSR | Cruise Summary Reports |
| CTD | Conductivity-Temperature-Depth Probe |
| DAC | Data Assembly Centres |
| DCPC | Data Production & Collection Centre |
| DIM | Data and Information Management |
| DIVA | Data Interpolating Variational Analysis software |
| DMAC | IOOS Data Management & Communication |
| DMCG | Data Management Coordination Group (JCOMM) |
| DNA | Designated National Agency |
| DVD | Digital Versatile Disc or Digital Video Disc |
| E2EDM | End to End Data Management |
| ECET | European Countries in Economic Transition |
| EDIOS | European Directory of Ocean-Observing Systems |
| EDMED | European Directory of Environmental DataSets |
| EDMERP | European Directory of Marine Environmental Research Projects |

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|---|---|
| EDMO | European Directory of Marine Organisations |
| eJDS | electronic Journals Delivery Service |
| EMODNET | European Marine Observation and Data Network |
| ERDDAP | NOAA's Environmental Research Division's Data Access Programme |
| ETDMP | Expert Team on Data Management Practices (JCOMM/IODE) |
| EU | European Union |
| EUMETSAT | European Organisation for the Exploitation of Meteorological Satellites |
| FAGS | Federation of Astronomical and Geophysical Data Analysis Services (ICSU) |
| FAO | Food & Agriculture Organization of the United Nations |
| FAO-KCEW | FAO's Knowledge Exchange & Capacity Building Division |
| FAQ | Frequenty Asked Questions |
| FFA | Pacific Islands Forum Fisheries Agency |
| FP7 | European Commission - Research: The Seventh Framework Programme |
| FUST | Flanders UNESCO Science Trust Fund |
| GBIF | Global Biodiversity Information Facility |
| GDAC | Global Data Assembling Center |
| GCLME | Guinea Current Large Marine Ecosystem project |
| GCOS | Global Climate Observing System |
| GDAC | Global Data Assembly Centre |
| GE | Group of Experts |
| GE-BICH | IODE Group of Experts on Biological & Chemical Data Management & Exchange Practises |
| GE-MIM | IODE Group of Experts on Marine Information Management |
| GEO/GEOSS | Global Earth Observations/Global Earth Observation System of Systems |
| GHRSST | Global High-Resolution Sea Surface Temperature |
| GIS | Geographic Information System |
| GISC | Global Information System Centre (WMO) |
| GLOSS | Global Sea Level Observing System |
| GOBI | Global Ocean Biodiversity Initiative |
| GODAR | Global Oceanographic Data Archaeology & Rescue |
| GOOS | Global Ocean Observing System |
| GOSIC | Global Observing Systems Information Center |
| GOSUD | Global Ocean Surface Underway Data Pilot Project |
| GRASP | GOOS Regional Alliance for the South Pacific |
| GSSC | GOOS Scientific Steering Committee |
| GTS | Global Telecommunication System |
| GTSPP | Global Temperature & Salinity Profile Programme |
| HAB | Harmful Algal Bloom Programme |
| HABMAP | Habitat Mapping for Conservation & Management of the Southern Irish Sea |
| HAE-DAT | Harmful Algal Events Database |
| HAIS | Harmful Algal Information System |

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| HINARI | Health InterNetwork Access to Research Initiative |
| HMEI | Association of Hydro-Meteorological Equipment Industry |
| HTTP | Hypertext Transfer Protocol |
| IAMSLIC | International Association of Aquatic & Marine Libraries & Information Centres |
| IAU | International Astronomical Union (ICSU) |
| IBSS | Institute of Biology of the Southern Seas (Ukraine) |
| ICAM | Integrated Coastal Area Management |
| ICAN | International Coastal Atlas Network |
| ICES | International Council for the Exploration of the Sea |
| ICES-RECO | ICES Reference coding system |
| ICOADS | International Comprehensive Ocean-Atmosphere Data Set |
| ICSU | International Council for Science |
| IFREMER | Institut Français de Recherche pour l'Exploitation de la Mer (French Institute of Research & Exploitation of the Sea) (France) |
| IIO | Instituto de Investigaciones Oceanológicas |
| IMBER | Integrated Marine Biogeochemistry and Ecosystem Research |
| IMDIS | International Conference On Marine Data and Information Systems |
| IMIS | Integrated Marine Information System |
| INASP | International Network for the Availability of Scientific Publications |
| INASP-PERii | INASP's Programme for the Enhancement of Research Information (PERii) |
| INCOIS | Indian National Centre for Ocean Information Services |
| IOC | Intergovernmental Oceanographic Commission (of UNESCO) |
| IOCCP | International Ocean Carbon Coordination Project |
| IOCINDIO | IOC's Regional Committee for the Central Indian Ocean |
| IODE | International Oceanographic Data & Information Exchange |
| IOI | International Ocean Institute |
| IOOS | The US Integrated Ocean Observing System |
| IPET-DRC | Inter-Programme Expert Team on Data Representation and Codes |
| IPET-MDI | Inter-Programme Expert Team on Metadata, Data and Interoperability |
| IPHAB | Intergovernmental Panel on Harmful Algal Blooms |
| IPY | International Polar Year |
| ISA | International Seabed Authority |
| ISDM | Integrated Science Data Management |
| ISO | International Organization for Standardization |
| ISSHA | International Society for the Study of Harmful Algae |
| IT | Information Technology |
| ITCOocean | International Training Centre for Operational Oceanography |
| ITIL | Information Technology Infrastructure Library |
| IUGG | International Union of Geodesy and Geophysics (ICSU) |
| JCOMM | WMO-IOC Joint Technical Commission on Oceanography and Marine Meteorology |
| JCOMMOPS | JCOMM in situ Observing Platform Support Centre |
| JGOFS | Joint Global Ocean Flux Study |

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| JODC | Japan Oceanographic Data Centre |
| JSTOR | Journal Storage |
| KODC | Republic of Korea Oceanographic Data Centre |
| KORDI | Republic of KoreaOcean Research and Development Institute |
| LDP | Light Data Provider |
| LME | Large Marine Ecosystems |
| MARBEF | Marine Biodiversity and Ecosystem Functioning |
| MARIS | Marine Information Services (Netherlands) |
| MBARI | Monterey Bay Aquarium Research Institute |
| MBL-WHOI | Marine Biological Laboratory - Woods Hole Oceanographic Institution |
| MEDI | Marine Environmental Data Inventory |
| MEDS | Marine Information Data Service (Canada) |
| META-T | JCOMM Water Temperature [instrumental] metadata |
| MIM | Marine Information Management |
| MMI | Marine Metadata Interoperability Project |
| MoES | Ministry of Earth Sciences |
| MONDAT | HAB Monitoring Database |
| MOTIIVE | Marine Overlays on Topography |
| MoU | Memorandum of Understanding |
| MSP | Marine Spatial Planning |
| NASA | National Aeronautics & Space Administration (US) |
| NDBC | National Data Buoy Center |
| NEAR-GOOS | North-East Asia Regional Global Ocean Observing System |
| NetCDF | Network Common Data Form |
| NF | Nippon Foundation |
| NDG | NERC Data Grid (United Kingdom) |
| NGO | Non Governmental Organisation |
| NMDIS | National Marine Data & Information Service |
| NOAA | National Oceanic & Atmospheric Administration |
| NODC | National Oceanographic Data Centre |
| NSF | National Science Foundation |
| OAI-PMH | Open Archives Initiative – protocol for Metadata Harvesting |
| OARE | Online Access to Research in the Environment |
| OBIS | Ocean Biogeographic Information System |
| ODAS | Ocean Data Acquisition System |
| ODASMS | ODAS Metadata Service |
| ODIN | Ocean Data Information Network |
| ODINAFRICA | Ocean Data & Information Network for Africa |
| ODINBLACKSEA | Ocean Data & Information Network for the Black Sea Region |
| ODINCARSA | Ocean Data & Information Network for the Caribbean & South America Regions |
| ODINCARSA - LA | Ocean Data & Information Network for the Caribbean & South America Regions – Latin America |
| ODINCINDIO | Ocean Data & Information Network for the Central Indian Ocean Region |

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| ODINECET | Ocean Data & Information Network for European Countries in Economic Transition |
| ODIN-WESTPAC | Ocean Data & Information Network for the Western Pacific Region |
| ODP | OceanDataPortal |
| ODS | Ocean Data Standards |
| ODV | Ocean Data View |
| OGC | Open Geospatial Consortium |
| OGC-CSW | OGC catalogue service |
| OGP | International Association of Oil & Gas Producers |
| OOS | Ocean Observations & Services |
| OPA | Observations Programme Area |
| OTA | OceanTeacher Academy |
| OTN | Ocean Tracking Network |
| PDF | Adobe Portal Document Format |
| PICES | The North Pacific Marine Science Organization |
| PIMRIS | Pacific Island Marine Resources Information System |
| POGO | Partnership for Observation of the Global Oceans |
| POL | Proudman Oceanographic Laboratory |
| PSMSL | Permanent Service for Mean Sea Level |
| QA | Quality Assurance |
| QARTOD | Quality Assurance of Real Time Oceanographic Data |
| QC | Quality Control |
| RIHMI | Russian Institute of HydroMeteorological Information (Russia) |
| RMIC | Regional Marine Instrument Centre |
| RNODC | Responsible National Ocean Data Center |
| RON | Regional OBIS Nodes |
| RP | Regular programme |
| RTMC | Real Time Monitoring Centre |
| SAMOS | Shipboard Automated Meteorological and Oceanographic System |
| SCAR | Scientific Committee for Arctic Research |
| SCCID | Strategic Coordinating Committee for Information and Data (ICSU) |
| SCOR | Scientific Committee for Oceanic Research |
| SDI | Spatial Data Infrastructure |
| SDN | (*see SeaDataNet*) |
| SeaDataNet | Pan-European Infrastructure for Ocean & Marine Data Management |
| SEAGOOS | Southeast Asian Global Ocean Observing System |
| SEDIS | Scientific Earth Drilling Information Service |
| SEP | Southeast Pacific |
| SG | Steering Group |
| SG-MEDI | Steering Group for the MEDI Project |
| SIMORC | System of Industry Metocean Data for the Offshore & Research Communities |
| SISMER | Système d'Informations Scientifiques pour la Mer (France) |
| SMOS | Soil Moisture and Ocean Salinity |
| SOA | State Oceanic Administration (China) |

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| SOAP | Simple Object Access Protocol |
| SOC | Specialized Oceanography Data Centers |
| SOLAS | Surface Ocean - Lower Atmosphere Study |
| SOOP | Ship-of-Opportunity Programme |
| SOPAC | Pacific Islands Applied Geoscience Commission |
| SOT | Ship Observations Team (JCOMM) |
| SPC | Secretariat of the Pacific Community |
| SPINCAM | South Eastern Pacific Information Network in support to Coastal Areas Management) |
| SPREP | Pacific Regional Environmental Programme |
| SSMR/SSMI | special sensor microwave radiometer or imager |
| SSS | Sea Surface Salinity |
| SST | Sea Surface Temperature |
| TESAC | Temperature, Salinity & Current Report |
| TSG | ThermoSalinoGraph |
| ToR | Terms of Reference |
| TWS | Tsunami Warning System |
| UBSS | Upgrade Black Sea Scientific Network |
| UHasselt | University of Hasselt, Belgium |
| UHSLC | University of Hawaii Sea Lee Center |
| UK | United Kingdom |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Education, Science & Cultural Organization |
| URL | Universal Resource Locator |
| URSI | International Union of Radio Science/ Union Radio-Scientifique Internationale |
| USA | United States of America |
| US NODC | United States National Oceanographic Data Centre |
| USP | University of the South Pacific |
| VLIZ | Vlaams Instituut voor de Zee (Flanders Marine Institute), Belgium |
| VNIRO | Russian Federal Research Institute of Fisheries and Oceanography |
| VOA3R | Virtual Open Access Agriculture & Aquaculture Repository |
| WCMC | World Conservation Monitoring Centre |
| WCRP | World Climate Research Programme |
| WDC | World Data Centre (ICSU) |
| WDC-MARE | World Data Centre for Marine Environmental Sciences |
| WDS | World Data System (ICSU) |
| WESTPAC | IOC Sub-Commission for the Western Pacific Region |
| WFS | Web Feature Service Interface Standard |
| WHO | World Health Organisation |
| WIGOS | WMO Integrated Global Observing System |
| WIS | WMO Information System |
| WMO | World Meteorological Organization |
| WMS | Web Map Service |
| WOCE | World Ocean Circulation Experiment |

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| WOD | World Ocean Database |
| WoRMS | World Register of Marine Species |
| XBT | Expendable Bathythermograph |
| XML | Extensible Markup Language |

In this Series *Languages*

**Reports of Governing and Major Subsidiary Bodies,** which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:

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| **1.** | Eleventh Session of the Working Committee on international Oceanographic Data Exchange | E, F, S, R |
| **2.** | Seventeenth Session of the Executive Council | E , F, S, R,Ar |
| **3.** | Fourth Session of the Working Committee for Training, Education and Mutual Assistance | E, F, S, R |
| **4.** | Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment | E, F, S, R |
| **5.** | First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions | E, F, S |
| **6.** | Third Session of the *ad hoc* Task team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime | E, F, S, R |
| **7.** | First Session of the Programme Group on Ocean Processes and Climate | E, F, S, R |
| **8.** | Eighteenth Session of the Executive Council | E, F, S, R, Ar |
| **9.** | Thirteenth Session of the Assembly | E, F, S, R, Ar |
| **10.** | Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific | |
| **11.** | Nineteenth Session of the Executive Council, Paris, 1986 | E, F, S, R, Ar |
| **12.** | Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment | E, F, S |
| **13.** | Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange | E, F, S, R |
| **14.** | Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Havana, 1986 | E, F, S |
| **15.** | First Session of the IOC Regional Committee for the Central Eastern Atlantic, Praia, 1987 | E, F, S |
| **16.** | Second Session of the IOC Programme Group on Ocean Processes and Climate | E, F, S |
| **17.** | Twentieth Session of the Executive Council, Paris, 1987 | E, F, S, R, Ar |
| **18.** | Fourteenth Session of the Assembly, Paris, 1987 | E, F, S, R, Ar |
| **19.** | Fifth Session of the IOC Regional Committee for the Southern Ocean | E, F, S, R |
| **20.** | Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Beijing, 1987 | E, F, S, R |
| **21.** | Second Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Arusha, 1987 | E, F |
| **22.** | Fourth Session of the IOC Regional Committee for the Western Pacific, Bangkok, 1987 | E only |
| **23.** | Twenty-first Session of the Executive Council, Paris, 1988 | E, F, S, R |
| **24.** | Twenty-second Session of the Executive Council, Paris, 1989 | E, F, S, R |
| **25.** | Fifteenth Session of the Assembly, Paris, 1989 | E, F, S, R |
| **26.** | Third Session of the IOC Committee on Ocean Processes and Climate, Paris, 1989 | E, F, S, R |
| **27.** | Twelfth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Novosibirski, 1989 | E, F, S, R |
| **28.** | Third Session of the Sub-Commission for the Caribbean and Adjacent Regions, Caracas, 1989 | E, S |
| **29.** | First Session of the IOC Sub-Commission for the Western Pacific, Hangzhou, 1990 | E only |
| **30.** | Fifth Session of the IOC Regional Committee for the Western Pacific, Hangzhou, 1990 | E only |
| **31.** | Twenty-third Session of the Executive Council, Paris, 1990 | E, F, S, R |
| **32.** | Thirteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, New York, 1990 | E only |
| **33.** | Seventh Session of the IOC Committee for the Global Investigation of Pollution in the Marine Environment, Paris, 1991 | E, F, S, R |
| **34.** | Fifth Session of the IOC Committee for Training, Education and Mutual Assistance in Marine Sciences, Paris, 1991 | E, F, S, R |
| **35.** | Fourth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1991 | E, F, S, R |
| **36.** | Twenty-fourth Session of the Executive Council, Paris, 1991 | E, F, S, R |
| **37.** | Sixteenth Session of the Assembly, Paris, 1991 | E, F, S, R, Ar |
| **38.** | Thirteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Baja California, 1991 | E, F, S, R |
| **39.** | Second Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1992 | E only |
| **40.** | Twenty-fifth Session of the Executive Council, Paris, 1992 | E, F, S, R |
| **41.** | Fifth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1992 | E, F, S, R |
| **42.** | Second Session of the IOC Regional Committee for the Central Eastern Atlantic, Lagos, 1990 | E, F |
| **43.** | First Session of the Joint IOC-UNEP Intergovernmental Panel for the Global Investigation of Pollution in the Marine Environment, Paris, 1992 | E, F, S, R |
| **44.** | First Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1992 | E, F, S |
| **45.** | Fourteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 1992 | E, F, S, R |
| **46.** | Third Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Vascoas, 1992 | E, F |
| **47.** | Second Session of the IOC Sub-Commission for the Western Pacific, Bangkok, 1993 | E only |
| **48.** | Fourth Session of the IOC Sub-Cornmission for the Caribbean and Adjacent Regions, Veracruz, 1992 | E, S |
| **49.** | Third Session of the IOC Regional Committee for the Central Eastern Atlantic, Dakar, 1993 | E, F |
| **50.** | First Session of the IOC Committee for the Global Ocean Observing System, Paris, 1993 | E, F, S, R |
| **51.** | Twenty-sixth Session of the Executive Council, Paris, 1993 | E, F, S, R |
| **52.** | Seventeenth Session of the Assembly, Paris, 1993 | E, F, S, R |
| **53.** | Fourteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Tokyo, 1993 | E, F, S, R |
| **54.** | Second Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1993 | E, F, S |
| **55.** | Twenty-seventh Session of the Executive Council, Paris, 1994 | E, F, S, R |
| **56.** | First Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Melbourne, 1994 | E, F, S, R |
| **57.** | Eighth Session of the IOC-UNEP-IMO Committee for the Global Investigation of Pollution in the Marine Environment, San José, Costa Rica, 1994 | E, F, S |
| **58.** | Twenty-eighth Session of the Executive Council, Paris, 1995 | E, F, S, R |
| **59.** | Eighteenth Session of the Assembly, Paris, 1995 | E, F, S, R |
| **60.** | Second Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995 | E, F, S, R |

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| **61.** | Third Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1995 | E only |
| **62.** | Fifteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Papetee, 1995 | E, F, S, R |
| **63.** | Third Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1995 | E, F, S |
| **64.** | Fifteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange | E, F, S, R |
| **65.** | Second Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995 | E only |
| **66.** | Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996 | E only |
| **67.** | Fifth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Christ Church, 1995 | E, S |
| **68.** | Intergovernmental Meeting on the IOC Black Sea Regional Programme in Marine Sciences and Services | E, R |
| **69.** | Fourth Session of the IOC Regional Committee for the Central Eastern Atlantic, Las Palmas, 1995 | E, F, S |
| **70.** | Twenty-ninth Session of the Executive Council, Paris, 1996 | E, F, S, R |
| **71.** | Sixth Session for the IOC Regional Committee for the Southern Ocean and the First Southern Ocean Forum, Bremerhaven, 1996 | E, F, S, |
| **72.** | IOC Black Sea Regional Committee, First Session, Varna, 1996 | E, R |
| **73.** | IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Fourth Session, Mombasa, 1997 | E, F |
| **74.** | Nineteenth Session of the Assembly, Paris, 1997 | E, F, S, R |
| **75.** | Third Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1997 | E, F, S, R |
| **76.** | Thirtieth Session of the Executive Council, Paris, 1997 | E, F, S, R |
| **77.** | Second Session of the IOC Regional Committee for the Central Indian Ocean, Goa, 1996 | E only |
| **78.** | Sixteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Lima, 1997 | E, F, S, R |
| **79.** | Thirty-first Session of the Executive Council, Paris, 1998 | E, F, S, R |
| **80.** | Thirty-second Session of the Executive Council, Paris, 1999 | E, F, S, R |
| **81.** | Second Session of the IOC Black Sea Regional Committee, Istanbul, 1999 | E only |
| **82.** | Twentieth Session of the Assembly, Paris, 1999 | E, F, S, R |
| **83.** | Fourth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1999 | E, F, S, R |
| **84.** | Seventeenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Seoul, 1999 | E, F, S, R |
| **85.** | Fourth Session of the IOC Sub-Commission for the Western Pacific, Seoul, 1999 | E only |
| **86.** | Thirty-third Session of the Executive Council, Paris, 2000 | E, F, S, R |
| **87.** | Thirty-fourth Session of the Executive Council, Paris, 2001 | E, F, S, R |
| **88.** | Extraordinary Session of the Executive Council, Paris, 2001 | E, F, S, R |
| **89.** | Sixth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, San José, 1999 | E only |
| **90.** | Twenty-first Session of the Assembly, Paris, 2001 | E, F, S, R |
| **91.** | Thirty-fifth Session of the Executive Council, Paris, 2002 | E, F, S, R |
| **92.** | Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Lisbon, 2000 | E, F, S, R |
| **93.** | Eighteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Cartagena, 2001 | E, F, S, R |
| **94.** | Fifth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2001 | E, F, S, R |
| **95.** | Seventh Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Mexico, 2002 | E, S |
| **96.** | Fifth Session of the IOC Sub-Commission for the Western Pacific, Australia, 2002 | E only |
| **97.** | Thirty-sixth Session of the Executive Council, Paris, 2003 | E, F, S, R |
| **98.** | Twenty-second Session of the Assembly, Paris, 2003 | E, F, S, R |
| **99.** | Fifth Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Kenya, 2002 (* Executive Summary available separately in E, F, S & R) | E* |
| **100.** | Sixth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, St. Petersburg (USA), 2002 (* Executive Summary available separately in E, F, S & R) | E* |
| **101.** | Seventeenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 2003 (* Executive Summary available separately in E, F, S & R) | E* |
| **102.** | Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2003 (* Executive Summary available separately in E, F, S & R) | E* |
| **103.** | Nineteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Wellington, New Zealand, 2003 (* Executive Summary available separately in E, F, S & R) | E* |
| **104.** | Third Session of the IOC Regional Committee for the Central Indian Ocean, Tehran, Islamic Republic of Iran, 21-23 February 2000 | E only |
| **105.** | Thirty-seventh Session of the Executive Council, Paris, 2004 | E, F, S, R |
| **106.** | Seventh Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2005 (* Executive Summary available separately in E, F, S & R); and Extraordinary Session, Paris, 20 June 2005 | E* |
| **107.** | First Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Perth, Australia, 3–5 August 2005 | E only |
| **108.** | Twentieth Session of the Intergovernmental Coordination Group for the Tsunami Warning System in the Pacific, Viña del Mar, Chile, 3–7 October 2005 (* Executive Summary available separately in E, F, S & R) | E* |
| **109.** | Twenty-Third Session of the Assembly, Paris, 21–30 June 2005 | E, F, S, R |
| **110.** | First Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Rome, Italy, 21–22 November 2005 | E only |
| **111.** | Eighth Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Recife, Brazil, 14–17 April 2004 (* Executive Summary available separately in E, F, S & R) | E* |
| **112.** | First Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions (ICG/CARIBE-EWS), Bridgetown, Barbados, 10–12 January 2006 | E only |
| **113.** | Ninth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Cartagena de Indias, Colombia, 19–22 April 2006 (* Executive Summary available separately in E, F, S & R) | E S* |

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| **114.** | Second Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Hyderabad, India, 14–16 December 2005 | E only |
| **115.** | Second Session of the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology, Halifax, Canada, 19–27 September 2005 (Abridged final report with resolutions and recommendations) | E, F, R, S |
| **116.** | Sixth Session of the IOC Regional Committee for the Western Indian Ocean (IOCWIO), Maputo, Mozambique, 2–4 November 2005 (* Executive Summary available separately in E, F, S & R) | E* |
| **117.** | Fourth Session of the IOC Regional Committee for the Central Indian Ocean, Colombo, Sri Lanka 8–10 December 2005 (* Executive Summary available separately in E, F, S & R) | E* |
| **118.** | Thirty-eighth Session of the Executive Council, Paris, 20 June 2005 (Electronic copy only) | E, F, R, S |
| **119.** | Thirty-ninth Session of the Executive Council, Paris, 21–28 June 2006 | E, F, R, S |
| **120.** | Third Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Bali, Indonesia, 31 July–2 August 2006 (*Executive Summary available separately in E,F,S & R) | E* |
| **121.** | Second Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Nice, France, 22–24 May 2006 | E only |
| **122.** | Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 16–18 March 2005 (* Executive Summary available separately in E, F, S & R) | E* |
| **123.** | Fourth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-IV), Mombasa, Kenya, 30 February-2 March 2007 (* Executive Summary available separately in E, F, S & R) | E* |
| **124.** | Nineteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Trieste, Italy, 12–16 March 2007 (* Executive Summary available separately in E, F, S & R) | E* |
| **125.** | Third Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Bonn, Germany, 7–9 February 2007 (* Executive Summary available separately in E, F, S & R) | E* |
| **126.** | Second Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Cumaná, Venezuela, 15–19 January 2007 (* Executive Summary available separately in E, F, S & R) | E* |
| **127.** | Twenty-first Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Melbourne, Australia, 3–5 May 2006 (* Executive Summary available separately in E, F, S & R) | E* |
| **128.** | Twenty-fourth Session of the Assembly, Paris, 19–28 June 2007 | E, F, S, R |
| **129.** | Fourth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Lisbon, Portugal, 21–23 November 2007 (* Executive Summary available separately in E, F, S & R) | E* |
| **130.** | Twenty-second Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Guayaquil, Ecuador, 17–21 September 2007 (* Executive Summary available in E, F, S & R included) | E* |
| **131.** | Forty-first Session of the Executive Council, Paris, 24 June–1 July 2008 | E, F, R, S |
| **132.** | Third Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Panama City, Panama, 12–14 March 2008 (* Executive Summary available separately in E, F, S & R) | E* |
| **133.** | Eighth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 17–20 April 2007 (* Executive Summary available separately in E, F, S & R) | E* |
| **134.** | Twenty-third Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Apia, Samoa, 16–18 February 2009 (*Executive Summary available separately in E, F, S & R) | E* |
| **135.** | Twentieth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Beijing, China, 4–8 May 2009 (*Executive Summary available separately in E, F, S & R) | E* |
| **136.** | Tenth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Puerto La Cruz, Bolivarian Republic of Venezuela, 22–25 October 2008 (*Executive Summary available separately in E, F, S & R) | E, S* |
| **137.** | Seventh Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VII), Sabah, Malaysia, 26–29 May 2008 (*Executive Summary available separately in E, F, S & R) | E* |
| **138.** | Ninth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, France, 10–12 June 2009 (* Executive Summary available separately in E, F, S & R); | E* |
| **139.** | Fifth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Athens, Greece, 3–5 November 2008 (* Executive Summary available separately in E, F, S & R) | E* |
| **140.** | Fourth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Fort-de-France, Martinique, France, 2–4 June 2009 (* Executive Summary available separately in E, F, S & R) | E* |
| **141.** | Twenty-fifth Session of the Assembly, Paris, 16–25 June 2009 | E, F, R, S |
| **142.** | Third Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology, Marrakesh, Morocco, 4–11 November 2009 | E, F, R, S |
| **143.** | Ninth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 22–24 April 2009 (* Executive Summary available separately in E, F, S & R) | E* |
| **144.** | Fifth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Managua, Nicaragua, 15–17 March 2010 (* Executive Summary available in E, F, S & R) | E* |
| **145.** | Sixth Session of the IOC Regional Committee for the Central and Eastern Atlantic Ocean, Accra, Ghana, 28–30 March 2010 (* Executive Summary available in E, F, S & R) | E* |
| **146.** | Forty-second Session of the Executive Council; Paris, 15, 19 & 20 June 2009 | E, F, R, S |
| **147.** | Forty-third Session of the Executive Council; Paris, 8–16 June 2010 | E, F, R, S |
| **148.** | Sixth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Istanbul, Turkey, 11–13 November 2009 (* Executive Summary available separately in Ar, E, F, S & R) | E* |
| **149.** | Seventh Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Paris, France, 23–25 November 2010 (* Executive Summary available separately in Ar, E, F, S & R) | E* |
| **150.** | Sixth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Santo Domingo, Dominican Republic, 26–29 April 2011 (* Executive Summary available in E, F, S & R) | E* |

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| **151.** | Twenty-fourth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Beijing, China, 24–27 May 2011 (*Executive Summary in E, F, S & R included) | E* |
| **152.** | Twenty-first Session of the IOC Committee on International Oceanographic Data and Information Exchange, Liège, Belgium, 23–26 March 2011 (*Executive Summary available separately in E, F, S & R) | E* |

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