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JCOMM/IODE EXPERT TEAM ON DATA MANAGEMENT PRACTICES (ETDMP) THIRD SESSION

IOC Project Office for IODE, Oostende, Belgium
16-19 October 2012

FINAL REPORT

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ANNEXES

1. OPENING OF THE SESSION

The Chair of the JCOMM/IODE Expert Team on Data Management Practices (ETDMP), Dr Sergey Belov, opened the Session on Tuesday 16 October 2012 at 09:20. He introduced the Provisional Agenda and Timetable. The Secretariat informed the Session of the working arrangements of the Meeting. The Chairman invited participants to introduce themselves. The list of participants is attached as **Annex II.** The Session adopted the Agenda (attached as **Annex I**).

2. ETDMP PROGRESS REPORT 2010-2012

This Agenda Item was introduced by Dr Sergey Belov, new Chair of the ETDMP. He recalled that JCOMM-IV had elected 5 new members of the Expert Team (Jixiang Chen, Richard Crout, Paul Oloo, Paulo Polito and Anyuan Xiong) as well as a new Chair (Sergey Belov). Subsequent to JCOMM-IV, and after issuing IOC Circular Letter 2443 on 6 June 2012, IOC had elected 4 additional members (Don Collins, Patrick Gorringe, Yutaka Michida and Tobias Spears). Following the offer from China to fully support extra members, Ms Ting Yu was added as an additional member of the Expert Team. He further informed the Group that Ms Nicola Scott had been invited in her capacity as ETMC Chair but she was unable to attend. Dr Nick Mikhailov had been invited as former Chair of the ETDMP in order to facilitate transition from the former to the current Team. Mr Sun had been invited because of his active collaboration on the ODS pilot project and Mr Keeley had been invited in view of his active participation and expertise in JCOMM and IODE.

The meeting was informed of the decisions and recommendations of the IODE Officers at their January 2012 meeting, which also took into account the decisions of IODE-XXI (March 2011):

Regarding **the IODE/JCOMM Standards process**:

- The Officers recommended that the ODS process should be used for the benefit of ODP and proposals should be actively submitted by ODP to ODS.

- The Officers, noting that a proposal for latitude/longitude had been prepared by Greg Reed some time ago but had not been submitted to ODS, requested Mr Reed to urgently finalize and submit the proposal to ODS.

    - Status: Mr Reed informed the Secretariat that comments from Bob Keeley had been received and Mr Reed is working on version 1.1 of the document. This has had low priority. **- ongoing**

- The Officers, noting the importance of standards to ODP, request Dr Mikhailov to prepare a number of proposals related to ODP, to ODS.

    - Status: The recommendation to focus on the following standards which are foreground for ODP: (i) date, time, lat/lon; (ii) projects, platforms. (iii)Instruments, organizations, parameter dictionaries. **Partially completed**.

- The Officers requested Mr Ariel Troisi, to promote ODS during the upcoming meeting of the Argo Steering Team (20-23 March 2012)

    - Status: ODS was promoted during the AST 13 last March and a request was made to the group to submit proposals of standards and best practices based

on the experience gathered by the Argo Data Managent Team. Although the request was taken by the AST, no submissions have been made to date.

- The Officers approved the revised work plan and budget, while calling for more active participation in, and support for, the ODS pilot project.

Mr Reed, by email, stated that another standard for consideration is netCDF. The OGC has approved the netCDF Core Encoding Standard and last month also approved the netCDF Enhanced Data Model Extension. An IODE recommended standard could be prepared based on these OGC standards. I think this should be given high priority as it is an important format for the exchange of oceanographic data. I would be prepared to contribute to a submission but would need other experts who are using netCDF to contribute.

Regarding **Metadata management** the Officers had taken note of the progress report during the Officers meeting.

Regarding the **IODE Ocean Data Portal**:

- The Officers urged the ODP team to urgently ensure that Argo data are also available through ODP.
    - Status: Argo data is available through ODP using GDAC Argo FTP index. - DONE
- The Officers requested the ODP team to make arrangements for a live demonstration of ODP v.2 during the Argo steering team meeting, and requested Mr Troisi to arrange for this demonstration with the Argo meeting organizers.
    - Status: Demonstration has been made during the AST meeting. DONE
- The Officers called on Member States to consider hosting and maintaining regional ODP nodes.
    - Status: Official process has not been initialized. – NOT DONE
- The Officers instructed the inter-sessional working group on the strategic plan to take into account ODP in the revised strategic plan
    - Status: Proposals were made for the strategic plan of the IOC IODE related to the expansion of the use of ODP. -DONE
- Taking into account the offer of Russia to establish and host a "National Support Centre for IODE/ODP" the Officers decided to re-assign the funds allocated for "ODP software development" to seminars, workshops and other training activities related to ODP.
    - Status: Funds were reassigned. DONE
- The Officers noted that OBIS was an important new data source for ODP and instructed the Secretariat to invite an OBIS expert to participate in the upcoming technical workshop on ODP.
    - Status: By 2013 a report is expected that describes a strategy on integrating ODP and OBIS, and the performance indicator is a percentage of ODP data and services be made accessible through OBIS. The ODP technical meeting requested that the cooperation between OBIS and ODP be discussed between the SG-OBIS (through its Chair), the ODP technical development team and the ODP project coordinator. So far this is delayed partly because OBIS is

currently revising its (internal) data system architecture, and the interaction with external systems is not yet discussed. In addition, the unclear status of ODP v2 has not pushed the item higher up on the agenda. Currently the ODP coordinator's role is shared between the OBIS project manager and the head of IODE. This was regarded a temporary solution and needs to be further discussed at IODE-XXII. - ONGOING

- The Officers approved the revised work plan and budget for ODP, as modified by the Officers

It was also recalled that, at the IODE Officers Meeting, the National Oceanographic Committee of the Russian Federation had agreed to offer to IOC/IODE to establish an IOC Project Office for IODE ODP. Taking into account the formal requirements related to Project Offices as well as the offer of Russia, the title of such "office" was changed to "**IOC Project Support Centre for IODE ODP"**.

The timeline for the establishment of the IOC Project Support Centre for IODE ODP would be as follows:

1- Consultations between IOC/IODE Secretariat and Russian Federation (January 2012)
2- IODE Officers meeting to consider the offer (31 January – 3 February, 2012)
3- MoU and business plan draft for discussion with Roshydromet (middle of February 2012),
4- Discussions on MoU and business plan draft during Technical Workshop on ODP (27-29 February 2012)
5- Consultations with IODE Officers to draft a DR for the upcoming EC of June 2012 ;
6- IOC EC June 2012 to adopt Resolution,
7 - MoU signing by September-October of 2012
8- Official opening of the Office: early 2013 (taking account the funding from Roshydromet)

The contribution of the Russian Federation will include:

(i) Office space for three members of staff, with all furniture and amenities for normal office operations;
(ii) The cost of utilities (water, power, heating, air conditioning) and telecommunications (telephone, fax);
(iii) Use of a permanent high-bandwidth internet connection;
(iv) The cost of taxes levied on the physical facilities;
(v) The cost of cleaning, maintenance and insurance of the physical facilities;
(vi) The equivalent of three full time support staff position, divided over several members of staff as follows: (1) One half time ODP Head; (2) One full time data manager to carry out ODP distributed marine system supporting; (3) One full time software developer to carry out ODP software tools and specifications; (3) the equivalent of one half time position to assist the Support Project Centre with cooperation with IODE Project Office and Expert Group's, interaction with other international marine data system.
(vii) Waiving of overheads on all funds that will be provided to the RIHMI-WDC for supporting the IOC Support Project Centre.

The Officers had expressed high appreciation for this substantial offer and recommended that it should be accepted. Accordingly they instructed the Secretariat to continue preparations for the submission of a Draft Resolution to the June 2012 Session of the IOC Executive Council. DONE

The Officers further requested Dr Mikhailov and Ms Iona to mention the possible establishment of the Support Centre during JCOMM-IV. DONE

Mr Ariel Troisi, IODE Co-Chair, has subsequently presented the case for the Centre at the 45th Session of the IOC Executive Council (26-28 June 2012) and the Executive Council had adopted the following Decision:

EC-XLV/Dec.4.2.1

Centre for the Ocean Data Portal

The Executive Council,

Recalling the importance of supporting technically IOC projects and programmes and of direct contributions by Member States to the activities of the IOC of global and regional scope,

Welcoming the offer of the Russian Federation to establish a Centre for the Ocean Data Portal at RIHMI-WDC of Roshydromet in Obninsk, IOC/EC-XLV/3 page 5

Having examined document IOC/EC-XLV/2 Annex 6 concerning the establishment of a Centre for the Ocean Data Portal by the Russian Federation,

Aware of the importance of the IODE Ocean Data Portal to facilitate the seamless access to oceanographic, marine meteorology, and other data and products,

Invites the Russian Federation to consider entering into a partnership agreement with the IOC of UNESCO concerning this Centre with a view to exchanges of information and possible joint activities related to the Ocean Data Portal at RIHMI-WDC of Roshydromet in Obninsk.

A Memorandum of Agreement has been prepared by the IOC Secretariat and has been sent to the National Oceanographic Committee of the Russian Federation on 27 July 2012 for approval and signature.

Dr Belov then introduced progress with the ETDMP-II work plan (included in the ETDMP-II report as Annex II) which is shown in Table 1.

Agenda item	Task	Deadline	Who	Budget	Achievements
3.1	**The Meeting requested** the JCOMM and IODE Secretariats to widely publicize adopted standards in their respective communities in order to promote their utilization	Continuous	JCOMM and IODE Secretariat	n/a	Discussed at JCOMM-4: *"The Commission noted with concern that the process of receiving recommended standards from Member States has been very slow. The Commission stressed he importance of standards for all aspects of JCOMM's work and in particular to ensure interoperability arrangements between data systems such as the Ocean Data Portal (ODP) and the WMO Information System (WIS), and emphasized that the success of this process is highly dependent on active participation of all WMO/IOC Members/Member States, programmes and related organizations through submitting suitable standards for consideration. The Commission therefore requested Members/Member States to participate actively in submitting standard proposals through the*

					ODS process."
3.2.3	**The Meeting decided** that the 30 code lists that are being used in the IODE Ocean Data Portal now should be submitted to the ODS process as soon as possible as candidate standards.	April 2011	ODP technical team	n/a	Code lists were submitted to the ODS process for conside0ration.
3.2.3	**The Meeting decided** that additional priorities for ODS will be identified by the IODE Ocean Data Portal and that this will include 3 types of standards: (i) date, time, lat/lon; (ii) platform. Instruments, organizations, parameter dictionary, projects; (iii) applying of OGC standards.	May 2010	ODP technical team	n/a	DONE
4.1.2	**The Meeting recommended** that the two centres should communicate and coordinate better focusing on the development of an infrastructure and service that can be easily used by end users.	Continuous	NMDIS (China) and NDBC (USA)	n/a	META-T project ended in late 2010. Instrument/Platform metadata now considered as part of MCDS, and a task of CMOCs to record metadata together with the data. To be discussed at ETMC-4
4.1.2	**The Meeting recommended further** that ODAS China and Meta-T should further discuss suitable tools for metadata creation and submission to facilitate submission of metadata to the systems. Canada's J-MetaWriter and Mikado were mentioned as examples.	Feb, 2011	NMDIS (China) and NDBC (USA)	n/a	META-T ended. Now considered as part of MCDS development. To be discussed at ETMC-4
5.1.3	**The Meeting requested** the ODP technical team to translate the ODP	November 2010	ODP technical team	n/a	Pending. Translation will be covered from the budget of the National Support Centre for IODE/ODP in early 2013.

	Light Data Provider training materials into English and to further develop relevant training materials on the data provider and light data provider, including video guides, in OceanTeacher.				PENDING
5.1.3	**The Meeting further recommended** the organization of a Session of the IODE Steering Group for the IODE Ocean Data Portal in September 2010 to coordinate and optimize performance of data providers and to attract additional data providers. That meeting can also be used to obtain feedback on ODP functionality with the objective of further finetuning and optimization. In addition the meeting could also provide an introduction to ODP v.2.	September 2010	IODE Secretariat	Meeting cost	DONE
5.2	**The Meeting decided** that ODP v.2. will need to be ready for demonstration by JCOMM-IV (mid 2012).	Mid 2012	ODP technical team	n/a	ODP v2 presented at JCOMM-4 but no live demonstration was made JCOMM-4 decided priority activities including "*Assist in the further development of the IODE Ocean Data Portal, its linkages with other ocean data systems (e.g. SeaDataNet, IMOS, OBIS, GEOSS), its interoperability with the WMO Information System (WIS),and its capacity development activities to ensure full participation of Members/Member States*"
5.2.1	**The Meeting instructed** the ETDMP Task team for ODP to prepare an "ODP v.2. White Paper" including functional and technical specifications by July 2010. The Paper will then be distributed to IMOS, SeaDataNet, WIS, IODE NODCs, GE-BICH, GBIF, OBIS etc. for comments by	July 2010	ETDMP TT for ODP	n/a	Paper was presented only at SG-ODP. No further distribution was made. - PENDING

	August 2010. The Paper will then be reviewed taking into consideration the received feedback, during the SG-ODP (planned for September 2010).				
5.2.1	**The Meeting requested** the Secretariats to prepare a letter, to be sent by the JCOMM Co-Presidents to the SeaDataNet Coordinators, to suggest a brief 1-2 meeting on future cooperation between SeaDataNet and the IODE Ocean Data Portal. It was recommended that this Meeting be held at the IOC Project Office for IODE in May or June 2010.	June 2010	Secretariats	n/a	Some email exchanges took place in July 2010 but no meeting was held. – NOT DONE
6.1	**ETDMP Task team for ODS: see above**				
6.2	**ETDMP Task team for Metadata: see above**				
6.3	**ETDMP Task team for ODP: see above**				
6.4	**The Meeting requested** Mr Ouellet to identify potential data providers for WIGOS (see ETDMP TT fore ODP work plan)				No information was received from Mr Ouellet.

Table 1: Progress Report of the ETDMP 2010-2011 (as adopted by ETDMP-II)

During the inter-sessional period the ETDMP activities were focused on fulfilling the recommendations of the IODE-XX (Recommendation IODE-XX.3), IODE-XXI (Recommendation IODE-XXI.4) and JCOMM-III (Recommentations 1(JCOMM-III), 4(JCOMM-III)). Main ETDMP activity was concentrated on the following items: (i) conducting the IODE/JCOMM Standards Process (ODS); (ii) improving the metadata management; (iii) development of the IODE Ocean Data Portal (ODP) and establishment of interoperability with WIS, SeaDataNet and other projects.

The outcomes of the progress made by the ETDMP Task Team for Ocean Data Standards (ODS): (i) best practices procedures agreed during Ad-Hoc ODS Meeting in April 2012;(ii)standard for 'Date and Time' has been published as an IOC/UNESCO Manuals and

Guides No. 54(2); QC Flags standards submission was made by GE-BICH; additional standards (i.e. Latitude, Longitude and Altitude, Units, etc.) have been identified for submission (iii) ToRs for ODSBP drafted for consideration;

The ETDMP Task Team on metadata management, Chaired by Ms Nicola Scott (UK) was tasked to compare semantic metadata profiles (MCP, SeaDataNet CDI, WMO Core) and make recommendations for better interoperability. Progress has been made with regard to defining a structure and performing profile comparisons. The Task Team was also instructed to consider ODAS metadata and META-T. Regarding the latter this work was completed and legacy recommendations were made.

The work on the IODE Ocean Data Portal has been focused on two main aspects: to invoke new data providers from NODCs, DNAs, and other IODE related projects and development of ODP V2. During the reported period four data providers were connected – IMOS (Australia), NODC (USA), ISDM (Canada) and Met Office (UK). Despite the slow growth of the data providers a significant contribution has been made for the GTSSP and Argo projects by NODC (USA) and ISDM (Canada). In addition collaboration on Argo data has been established with IFREMER to provide access to the Argo FTP index. **At present ODP is giving access to 100 datasets with over 1 000 000 profiles from 9 NODCs/DNAs (13 data providers registered).**

The IODE Ocean Data Portal has been an active partner in the JCOMM Pilot Project for WIGOS. This Pilot Project has been an important contribution to the development of WIGOS and the WMO Information System (WIS). Due to the important synergies between ODP and the Pilot Project a joint Steering Group was established. The Pilot Project concluded its work in December 2010. Its legacy includes documentation on instrument best practices and standards , the establishment of regional marine instrument centres, integration of marine data sets through interoperability with the WIS, and promoting quality management and standards. A list of legacy recommendations was included in the Pilot Project Report (see ftp://ftp.wmo.int/Documents/PublicWeb/amp/mmop/documents/JCOMM-TR/J-TR-48-JCOMM-PP-WIGOS/J-TR-48-WIGOS-PP-JCOMM-Report.pdf). Following the IODE-XX recommendation to provide interoperability arrangements with the SeaDataNet project, draft technical specifications of the IODE ODP and SeaDataNet interoperability have been created. In the document it was proposed to focus the challenge of interoperability between SDN and ODP based on the portal to portal interaction scheme.

The most significant problem for ODP at this moment is the small number of data providers. In order to attract data providers and to build capacity in Member States for participation in ODP two expert missions were organized to Australia and Argentina. Argentina is in the process of adopting the ODP technology for national use.

The National Oceanographic Committee of the Russian Federation had agreed to offer to IOC/IODE to establish an IOC Project Office for IODE ODP. Taking account the formal requirements related to Project Offices as well as the offer of Russia the title of such “office” was changed to “IOC Project Support Centre for IODE ODP”. The official opening of the Office is targeted in early 2013.

Dr Sun further reported that the Global Temperature – Salinity Profile Programme (GTSPP) has developed an automated procedure to create the best copy data files on a monthly basis. However, the volume of GTSPP data has significantly increased to more than two millions now. Processing of individual profile stations becomes technically challenging. It is under consideration that GTSPP may modify its current practice for providing best copy data files for the most recent three months only. The Chair of GTSPP, Dr. Charles Sun, will inform Dr. Sergey Belov, ETDMP Chair, about the change, if it does take in place.

Dr Mikhailov called attention to the importance of developing best practices involving data sets in a distributed data system. He suggested that ETDMP should develop recommendations on global data sets taking into account system-system, virtua; data provider and software agents.

Dr Iona called for attention to cooperation between the Task Teams but also beyond these: parallel work is being carried out in other projects like SeaDataNet, IMOS etc. The work of the Task Teams is also closely related to that of the new ODIP (Ocean Data Interoperability Platform) which aims at establishing an EU / USA / Australia/ IOC-IODE coordination platform the objective of which will be achieving the interoperability of ocean and marine data management infrastructures, and to demonstrate this coordination through several joint EU-USA-Australia-IOC/IODE prototypes that would ensure persistent availability and effective sharing of data across scientific domains, organisations and national boundaries. She stated that ODP should therefore be considered as a federated system of these activities.

Dr Belov considered whether existing vocabularies hosted by e.g. BODC's vocabulary server could be used. He noted that physically there is no problem to set up a link with the BODC voc server but he noted that climatlogical data (average T, min, max) is still an empty space in the BODC voc.

Dr Mikhailov stressed the need for a unique name for platforms and organizations. This not only requires a code name but also full information on the instrument.

3. OCEAN DATA STANDARDS

OCEAN DATA STANDARDS PROCESS

This agenda item was introduced by Prof Yutaka Michida. He informed the meeting that the presentation was also on behalf of Mr Paul Oloo. He recalled discussions at (i) JCOMM/IODE Expert Team on Data Management Practices, 2nd Session (Apr. 6-7, 2010); and (ii) JCOMM/IODE Steering Group for the Ocean Data Standards Pilot Project, Ad hoc Session (Apr 23-25,2012). For the progress report of the ODS pilot project he referred to Table 2. He recalled that only 2 standards have been passed through the review process. These will be officially endorsed at IODE-XXII. One proposal is still being reviewed.

He recalled that, during the ad hoc Session of the SG for ODS (April 2012) a revision of the ODS process was decided and subsequently implemented. The revision has been published online through http://www.oceandatastandards.org/index.php?option=com_content&task=view&id=48&Itemid=50

Figure 1 shows the review process used until 2012. Figure 2 shows the revised process that will be used as from 2013.

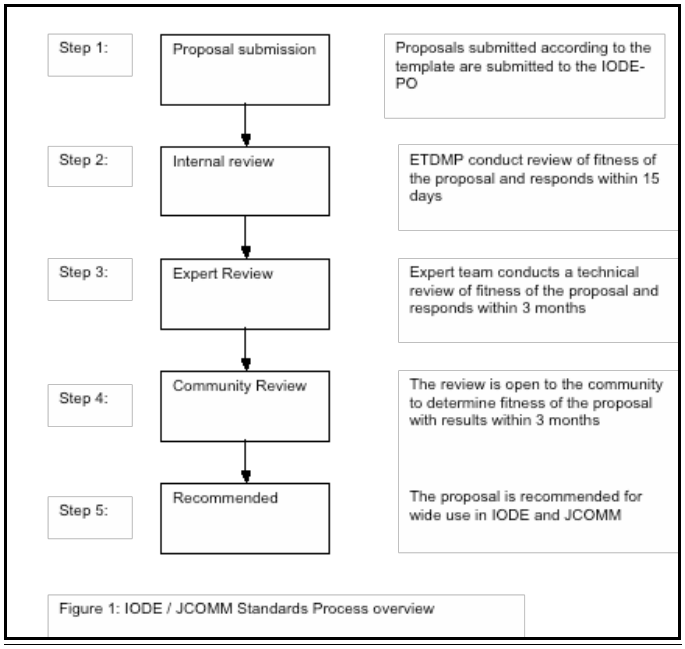

Figure 1: ODS review process until 2012

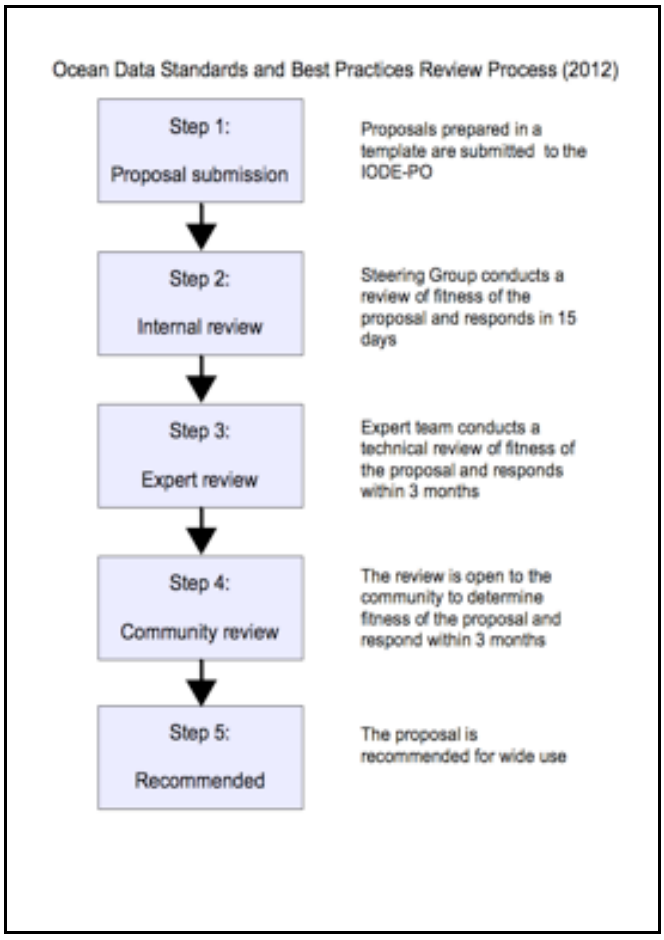

Figure 2: Ocean Data Standards and Best Practices Review Process 2012

It was also recommend to establish the ODS as a Joint JCOMM/IODE Project (instead of a pilot project). A recommendation in this regard will also be submitted to IODE-XXII for adoption.

Mr Pissierssens recalled that "*It was noted that the JCOMM Catalogue of Practices and Standards (http://bestpractice.iode.org/), hereafter referred to as the "Catalogue", is closely related to the ODS. The Catalogue contains material that describes standard practices of projects. Whereas these are not global standards they can be useful guidance to groups wanting some help in knowing what to do. Standards represent the global consensus and can grow out of existing project or regional standards as represented in the Catalogue. This deserves mentioning in the ToR."*

The meeting also recalled the outcome from JCOMM-IV regarding the 2012-2016 priorities for DMPA: *"(i) Continue to adopt standards/best practices for use by the marine meteorological and oceanographic community through the IODE-JCOMM Ocean Data Standards Process in support of the Global Framework for Climate Services (GFCS), the IOC-WMO-UNEP-ICSU Global Ocean Observing System (GOOS), IODE, and the WMO Integrated Global Observing System (WIGOS) implementation*;". So the role of the TT would then be to identify candidate standards relevant to the above,

The meeting then extensively reviewed the proposed "Draft Terms of Reference of the Ocean Data Standards and Best Practices Project (ODSBP)".

Objectives of the Project

The objective of the Ocean Data Standards and Best Practices Project (ODSBP) is to achieve broad agreement and commitment to adopt and publish, as appropriate, through IOC, WMO and ISO a number of standards related to ocean data management and exchange and to identify, promote and disseminate best practices in current use. This will include the following main tasks:

(i) Develop and manage a traceable process for the reception, reviewing and recommending of standards, and for identifying, promoting and disseminating best practices, based upon the process developed by the Ocean Data Standards Pilot Project;

(ii) Actively liaise with all relevant JCOMM and IODE programmes and projects, as well as with other related stakeholder communities;

(iii) Promote and monitor, through interaction with the relevant programmes, projects and communities, the usage of identified practices and recommended standards and,

(iv) If needed, promote fully or partly publication of adopted standards or best practices into relevant WMO and IOC Manuals and Guides according to relevant IOC and WMO procedures;

(v) Regularly review and revise recommended standards, and update best practices, based upon feedback from the relevant programmes, projects and communities;

(vi) Maintain an online and public JCOMM/IODE list of Standards and Best Practices including links to relevant documentation and tools.

Management

The Project will be managed by a Steering Group with the following Terms of Reference:

(i) Propose the vision, strategy and implementation of the Ocean Data Standards and Best Practices Project (ODSBP) to the IODE Committee and JCOMM DMCG through JCOMM/IODE ETDMP and seek their guidance;

(ii) Report to the IODE Committee and JCOMM DMCG through JCOMM/IODE ETDMP, on the progress of submission, recommendation, publishing and revision of standards and best practices recommended through the Project;

(iii) Develop a document on, and maintain the process for evaluating proposals for standards and best practices.

(iv) Report to the IODE Committee and JCOMM DMCG through JCOMM/IODE ETDMP on the expected standards or best practices to be submitted and work plans for dealing with them in an expeditious manner

(v) Received proposal submissions based on the priorities identified by JCOMM/IODE ETDMP Task Team for the Ocean Data Standards.

Membership of the Group

The Steering Group will be composed, initially, of the_members of the JCOMM/IODE ETDMP Task Team for Ocean Data Standards, co-chairs of JCOMM/IODE ETDMP Task Teams, experts from relevant JCOMMM bodies, relevant JCOMM and IODE network and projects, as well as with other related stakeholder communities with a special interest in data standards.

In addition representatives of major international oceanographic data management projects will be invited as relevant to the agenda as well as other experts as deemed necessary by the Steering Group. The Steering Group will designate its own Chair(s).

The SG will agree on a list of desired members of the SG and if possible identify other individuals to assist with current standards being reviewed. If possible additional members should be identified for expected standards to come.

The Steering Group will designate its own Chair(s).

Definitions

The Expert Team considered the need to clearly define the terms “standard” and “best practice” and decided as follows:

Standard: *A document established by consensus and approved by a recognized body that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context* [ISO/IEC Guide 2:1996, definition 3.2 defines a standard as]

[source: http://www.etsi.org/WebSite/Standards/WhatIsAStandard.aspx]

Best Practise: A **best practice** is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.

[source: http://en.wikipedia.org/wiki/Best_practice]

The meeting concluded that there are many possible definitions of “best practices”. For now the Team agreed to use the above as a working definition.

Prof Michida briefly reported on the status of the QC Flag proposal v 1.2. He recalled that the QC Flags standards submission was made by GE-BICH. The QC Flag proposal version 1.2 is at the Community Review stage awaiting comments from the Ocean community.

Suggested options of next step:

1) reject the proposal
2) revise the proposal as the ad hoc ODS group suggested
3) publish it as a best practice but not a QC flagging standard
4) having discussed at ETDMP-III, discuss further at IODE-22

Prof Michida closed by calling for the promotion of ODS candidates and to widely announce the published standards, and finalize the draft recommendation for IODE-XXII.

Dr Sun informed the meeting that he would report on the outcome of the ODS meeting and any comments by the ETDMP during the Second IODE Workshop on Quality Control of Chemical and Biological Oceanographic Data Collections, 22-24 October 2012.

PROGRESS REPORT

This agenda item was introduced by Dr Yutaka Michida, Co-Chair of the Task Team. The progress report of the Task Team for ODS is shown in Table 2.

Action	Task	Deadline	Who	Budget	Achievements
1	Develop standards/best practices for submitted proposals in the marine community through the IODE/JCOMM Standards Process as outlined by JCOMM-IV and IODE-XXI	continuous	SG	None	ODS standards process for developing standards/best practises to be coordinated by SG.
2	Prepare procedures for ODS for best practices.	May 2012	SG	None	Best practices procedures agreed during Ad-Hoc ODS Meeting in April 2012. DONE
	Prepare the candidates of standard for 'Date and Time', seek appropriate persons and/or organizations that make proposals.	February 2011	SG	None	Submission was made by Greg Reed of Australia NODC Australian Ocean Data Centre Joint Facility. The submission passed through ODS process and was published as an IOC/UNESCO Manuals and Guides No. 54(2). DONE
3	Encourage SeaDataNet, GE-BICH, GTSPP, and MyOcean and other relevant bodies to submit their proposals to ODS in particular with regard to QC flags.	Continous	SG	None	GE-BICH submitted QC Flag proposal for consideration by ODS. Ocean institutions / organizations are encouraged to make standards submission through the ODS in particular SeaDataNet, GE-BICH, GTSPP, MyOcean etc. PENDING

4	Examine further the candidates of standards for 'Lat, Lon, Alt.' (based on ISO 6709); and units (based on SI), and seek appropriate persons and/or organizations that make proposals.	October 2010 ????	SG	None	There are some issues related to depth which needs to be resolved on Lat, Lon, Alt. No standards submission has been made for Units. PENDING
4	Propose a working plan to set standards for i. Thematic codes like platform type, Geo-Area (IHB) and instrument type; Standard vocabularies for parameters, institutions, platforms/platform types and instruments; Cyclical Redundancy Check.	Continuous	JCOMM and IODE Secretariat	None	JCOMM and IODE needs to request Members/Member States to actively participate in identifying standard proposals for submission through the ODS process for wide community adoption. NOT DONE
	ii. QC flag standard and	November 2010.	SG		QC Flags standards submission was made by GE-BICH. The QC Flag proposal version 1.2 is at the Community Review stage awaiting comments from the Ocean community. PENDING
	iii. Discovery metadata profile (e.g. MCP, CDI, WMO Core) which is ISO 19115/19139 compliant	July 2011	SG		SeaDataNet submitted the CDI metadata profile based on ISO 19115. The standards submission was returned to the authors for revision at the Expert Review stage. There is need for its inclusion in the catalogue of best practices. A revised version of CDI based on ISO 19139 was to be submitted by April/June 2012. PENDING
5	Keep communication with ODP and Metadata TT respectively on standards process.	Continous	SG	None	We have not received any standards submission from ODP and Metadata TT. Need to establish modes of communication with the Chairs of Task Teams. NOT DONE
6	Report on the ODS development to the i. IODE-21.	March 2011	SG	Cost of travels	Progress Report on ODS was given to IODE-21. DONE

	ii. Report on the ODS development to the ETDMP-III.	October 2012	SG	Cost of travels	Progress Report on ODS to ETDMP-III. DONE
7	Deliver ODS Workshop report to chair of ETDMP	October 2012	SG	None	During ETDMP-III Meeting. DONE
8	Report on ODSBP review process document based on ODS web site description, and then present to ETDMP and IODE-XXII	October 2012 / March 2013	SG / Secretariat	None	Progress Report to ETDMP-III. DONE
9	Submit draft ToR for ODSBP to ETDMP for consideration and to go to IODE-22 and JCOMM	October 2012	SG	None	ToRs for ODSBP drafted for consideration by ETDMP during Ad-Hoc ODS Meeting April 2012. DONE
10	Decision to accept or reject QC Flags proposal and include draft recommendation to ETDMP and IODE-22	October 2012 / March 2013	SG/IODE Secetariat	Cost of travels	Report on QC Flags decision to ETDMP-III and IODE-22. See below - PENDING
11	Submit draft recommendation on standards that have passed review process for consideration by ETDMP and to go to IODE-22 and JCOMM.	October 2012	SG	None	During ETDMP-III Meeting.
12	Review candidate standards submitted to ODSBP process	Continous	JCOMM and IODE		JCOMM and IODE needs to encourage Members/Member States to participate actively in reviewing the candidate standards. NOT DONE

Table 2: Progress Report of the Task Team for ODS as adopted by ETDMP-II

FUTURE ACTIONS

This agenda item was introduced by Dr Richard Crout. He informed the meeting that the US Integrated Ocean Observing System (IOOS) Program supports Ocean Data Standards. Part of the US process of recognizing regional ocean observing system associations is to standardize quality control procedures. US IOOS recognized the efforts that had already been expended by the grass roots group, Quality Assurance of Real-Time Ocean Data (QARTOD). QARTOD had met five times over eight years to devise quality control procedures for in-situ ocean waves and ocean currents and had discussed biogeochemical parameters.

US IOOS has formally recognized QARTOD and is using the process to provide quality control manuals for 26 Core Variables. The individual manuals will undergo extensive review before being accepted as standards. Once accepted, ocean data should be quality controlled based on the procedures in each manual, regardless of who processes the data. Standardization of practices is one proposed tenant for acceptance as a regional ocean observing system by the Integrated Ocean Observing Council.

The Expert Team stressed that the QARTOD manuals referred to above could be excellent candidates for submission to the ODSBP.

The Expert Team recommended to include QARTOD in the list of relevant communities to be addressed by ODSBP, as referred to in the draft terms of reference of the ODSBP (see agenda item 3.1)

The detailed work plan is included in agenda item **10.1.**

4. METADATA MANAGEMENT

INSTRUMENT/PLATFORM METADATA

This agenda item was introduced by Don Collins. This item was mainly about ODAS metadata management under development in China. Mr Collins asked Ms Chen for comments.

Ms Chen reported that former ODAS metadata centre is now integrated in Chinese CMOC, which is now under development. The former ODAS metadata centre has been experiencing network problems so network improvements are underway with funds requested for next year's budget. Former ODAS metadata only had instrument metadata, but CMOC will soon also include discovery metadata. This year was mainly focused on collecting Argo data. In next year, CMOC plans to implement services.

ODAS metadata management is now considered part of the MCDS and a task of the newly created CMOC is to record metadata together with the data. This will be further discussed during the ETMC-IV meeting (November 2012).

US NODC has been working with NOAA National Data Buoy Center (NDBC) to represent buoy observation data holdings in netCD form. Using that standard data structure facilitates data discovery and access using multiple web services now available at NDBC and NODC. US NODC developed several variations netCDF templates to expand the ability of netCDF to capture several types of data, in addition to gridded data collections, including point, time series, profile, trajectory, and time series profile. Although the templates are currently available on the NODC website (http://www.nodc.noaa.gov/data/formats/netcdf/), they are explicitly not intended to be interpreted as a 'new standard' and are not required for sending data to be archived at NODC. The templates conform to UNIDATA netCDFClimate and Forecast (CF) and Attribute Convention for Data Discovery conventions, both of which are widely used standards.

Non-ODAS platforms metadata management

Mr. Collins presented information about the ICES and SeaDataNet vocabularies governance and management practices. Both ICES and SDN approach vocabulary management from a community based perspective. Members of the community propose new terms (usually described as "request a new code") for the vocabulary. The request, the proposed term, supporting documentation for the term and the code for the term are sent to a distributed list of reviewers who can agree with the request (no action needed), provide additional supporting documentation, suggest alternate codes, etc. Once the community has completed its review, usually within a few days to a few weeks, the new term and code are officially added to the vocabulary and the list is notified of the addition.

ICES, SDN and USNODC all participate in the ICES platform name management system. In this implementation, ICES adds the new term (platform name) and code to the database upon confirmation from USNODC. Using this approach, platform names and codes are synchronised in the ICES and USNODC vocabularies. This is based on the long relationship and content co-management between the USNODC and ICES platforms vocabularies. The ICES platforms vocabulary uses a subset of the SDN platforms types as a descriptive element for a platform record and has a detailed information model and infrastructure.

As understood by Mr Collins, final decisions for managing the content of (non-platform name) SDN vocabularies rests solely on SDN (through BODC staff). Decisions are made based on feedback from the respective community that is notified when vocabulary changes are requested.

Ms Iona commented that JCOMMOPS and SDN are coordinating platform identifiers (primarily for stationary platforms), but that ICES may have a different identifier. She requested that the Metadata Task Team investigate this more.

Dr Mikailov asked if the Metadata Task Team should consider identifying and recommending preferred controlled vocabulary authorities for the high priority vocabularies used in ODP.

Mr Collins identified ICES as the current preferred source for platform names, but asked to discuss issues with stationary platforms with Ms Iona after the meeting. He also noted that many vocabulary sources, including ICES and BODC/SeaDataNet/SeaVOX represent their vocabularies in xml using Simple Knowledge Organization System (SKOS) to facilitate machine-to-machine access to content. Mr Collins noted that the Metadata Task Team will investigate the use of SKOS.

As noted in the Metadata Task Team 2010-2012 report, a mapping and analysis was done to compare SDN, SeaVOX and ODP platform type vocabularies. With very few exceptions, the three vocabularies were essentially identical: this highlights both the common beginning point for each vocabulary (BODC) and the ease that new terms can be introduced into a vocabulary if a governance process is not implemented and followed. It may be that SKOS encoded xml can be automatically queried from a preferred vocabulary provider (for example, SDN) to update the equivalent ODP vocabulary with minimal programming required. This type of approach changes the focus for IODE metadata to one where IODE identifies widely used, preferred vocabulary providers and data producers can pick the vocabulary (and properly identify it as the source) from which they selected codes and terms.

The Expert Team recommended that attention should be given to providing a "clearinghouse service" that will inform users about existing controlled vocabularies and similar authority systems so as to avoid that groups will continue creating new such systems.

OTHER METADATA NEEDS AND INTEROPERABILITY

Mr Collins led a discussion about additional considerations regarding metadata management tasks and tools.

As noted earlier, SKOS (http://www.w3.org/2004/02/skos/) may be an effective xml implementation to facilitate consistent representation of controlled vocabularies and machine to machine exchanges. Many vocabulary management systems, such as SDN and ICES, already have some or all of their vocabularies represented in SKOS. Other organizations, such as USNODC, are developing this capability.

The US National Geophysical Data Center (NGDC) has developed a vocabulary management tool known as DOCUCOMP (https://www.ngdc.noaa.gov/docucomp/). This tool enables vocabulary and content managers to maintain contact information and other types of information used in ISO metadata records in the framework defined by the ISO 19115/19139 standard xml ('xml snippets'). Each DOCUCOMP entry is identified using a UUID. In an ISO metadata record, the section of information that is documented in DOCUCOMP can be represented in its 'resolved' or expanded presentation (all xml elements are shown) or its 'unresolved' or collapsed presentation (only the url to the DOCUCOMP record, keyed to the UUID is shown.

The Marine Metadata Interoperability (MMI) project (https://marinemetadata.org/), funded by the US National Science Foundation (NFS), continues to provide several online vocabulary mapping tools and ontology building tools. The MMI Vine tool (https://marinemetadata.org/vine) enables a vocabulary manager to "to create and edit mappings between concepts and terms in multiple ontologies or controlled vocabularies." Vocabularies that are documented and mapped using Vine can be exported to Web Ontology Language (OWL) xml files. Many BODC/SDN vocabularies are available in the MMI collection, which facilitates mapping other vocabularies to the BODC/SDN terms. It is unclear how often the BODC/SDN vocabularies in MMI are reviewed or updated. MMI also maintains a directory of other available tools related to vocabulary and ontology management (https://marinemetadata.org/tools).

PROGRESS REPORT

This agenda item was introduced by Mr Don Collins. The progress report of the Task Team for Metadata is shown in Table 3.

Action	Task	Deadline	Whom?	Achievements
1	Review relevant ISO19115 standards and guidelines. Provide overview report to ET regarding relevant standards.	July 2010	N.Scott, D.Collins, J.Chen	Team reviewed and compared MCP, WMO Core, and CDI standards and identified similarities and differences. Marine data management community converging on using ISO19115/19139 standards as the common exchange format. SeaDataNet provides a robust example of metadata support for both ocean and meteorological data. Reported at ETDMP-3. Completed.
1,1	Obtain copies of all relevant ISO19115-based standards (ISO19115-1 and -2, MCP, NAP, INSPIRE, WMO Core, others?)	May 2010	N.Scott, D.Collins	Completed August '10 by accessing available online resources. Completed.
1,15	Check for cost of purchasing/licensing the entire IS019X series of standards publications.	May 2010	D.Colliins	no longer required
1,2	Devise criteria for documenting the review/comparison.	June 2010	N.Scott, D.Collins, J.Chen	Team decided to make Task 2 a higher priority.
1,3	Coordinate/compile comments from reviewers.	September 2010	N.Scott, D.Collins, J.Chen	Team decided to make Task 2 a higher priority.
2	Review SeaDataNet metadata management structure & techniques. Provide an overview report to ET	August 2010	D.Scott, D.Collins, J.Chen, with assistance from	Comparison of some SeaDataNet vocabulary content completed Feb '11, sent to ETDMP Chair.

	identifying advantages & disadvantages of SeaDataNet approach.		Roy Lowry and others.	Governance technique used by SeaDataNet was compared to ICES platforms governance technique. Comparison presented to ETDMP-3. Completed.
2,1	Gather relevant SeaDataNet metadata management documentation.		N.Scott, D.Collins, J.Chen	Completed December '10
2,2	Devise criteria for documenting the review/comparison.	**March 2011**	N.Scott, D.Collins, J. Chen	Contact made with Roy Lowry at BODC in Dec '10 and semantic metadata dictionaries and vocabularies received and made available to TT. Comparison completed Feb '11
2,3	Coordinate/compile comments from reviewers.	**May 2011**	N.Scott, D.Collins, J.Chen	Feedback / comments on comparison requested from chair ETDMP Feb '11 - PENDING
3	Identify various semantic metadata management systems used by scientific community.	September 2010	N.Scott, D.Collins, J.Chen	Report at ETDMP-3 identifies Simple Knowledge Organizing System (SKOS) and Marine Metadata Interoperability (MMI) provide widely available semantic metadata management tools. SeaDataNet vocabularies in SKOS markup are widely recognized instance of well-managed semantic metadata.
3,1	Define criteria for selecting and comparing semantic metadata management systems.	October 2010	N.Scott, D.Collins, J.Chen	
3,2	Compare the various system structures, considering interoperability, highlighting similarities and inconsistencies between structure and content.	January 2010	N.Scott, D.Collins, J. Chen	
3,3	Report findings back to ET noting the most used system by the scientific data management community.	February, 2010	N.Scott, D.Collins, J.Chen	
4	Considering results from 1.0 & 3.1, user requirements defined by META-T and ODP & ODAS capabilities, define a common interoperability model/standard suitable for all (common vocabularies to be used throughout).	May 2011	N.Scott, D.Collins, J.Chen, additional volunteers?	Community convergence on ISO19115/19139 standards provides a common metadata infrastructure to facilitate interoperability was noted in remarks to ETDMP-3. META-T and ODAS management transferred to MCDS.
4,1	Propose model interoperability standard to wider community with the aim of adoption through Ocean Data Standards	June 2011 **October**	J.Scott, D.Collins, J.Chen	Deferred, awaiting development of a proposal to ODS.

	(ODS) process.	**2011**		
4,2	Upon adoption through Ocean Data Standards (ODS) process, publicise new standard to scientific data management community for general use.	End, 2011	N.Scott, D.Collins, J.Chen	Deferred, awaiting development of a proposal to ODS.
4,2	Upon adoption through Ocean Data Standards (ODS) process, publicise new standard to scientific data management community for general use.	End, 2011	N.Scott, D.Collins, J.Chen	Deferred, awaiting development of a proposal to ODS.

Table 3: Progress Report of the Task Team for ODS as adopted by ETDMP-II

The Task Team had two related tasks: 1) review and advise about a common (standard) metadata representation and 2) review and advise about vocabulary/thesaurus/ontology methodologies. As reported to IODE-XXI by Ms. Scott, progress has been difficult for this Task Team due to time limitations for each Team member for this task relative to other work commitments.

Common metadata representation

An important outcome expected from this project is for the ETDMP to recommend a common metadata model to support interoperable discovery of data across multiple resources, including the Ocean Data Portal (ODP). Many of the Team's tasks included elements to review and compare different metadata management capabilities and content representations, then to recommend a common metadata management model.

The Team recognized in its planning that we would look for voluntary assistance to accomplish task goals. This project was substantially augmented by work performed by other programs and similar efforts within the ocean data management community, such as those documented on the Geo-Seas website at http://www.geo-seas.eu/content/content.asp?menu=0050020_000000.

The Team notes a growing consensus among geospatial data managers to use ISO19115 and ISO19139 (the XML representation of ISO19115) as the common metadata information model to facilitate data discovery, reuse and exchange. Many programmes and organizations, including SeaDataNet and Geo-Seas projects, BODC, US NODC, NASA Global Change Master Directory (GCMD), and others are working on, or have accomplished a mapping of, discovery metadata (at least) into the ISO 19115/19139 representation. It was noted also that ISO19115 Geographic Metadata (to be referred to as ISO 19115-1) is under review and expected to be approved in December 2012. Xml translations and crosswalks are available from NOAA EDMC wiki https://geo-ide.noaa.gov/wiki/index.php?titles=Main_Page and other resources.

Mr Collins provided additional information on ISO 19115-2, 19115-1, and NAP (Clarification of 19115-2, 19115-1, NAP, and Remote sensing extensions, (RSE) to 19115:2003 with many thanks to Sarah O'Connor and Jaci Mize.)

First, there was 19115:2003. 19115:2003 is being revised to 19115-1, expected to be approved in Dec 2012.

The North American Profile, or NAP, is a subset of 19115:2003 that changed some elements' optionality and removed several elements from 19115:2003. The NAP has some production

errors that make it more challenging to implement. The NAP development team, led by the US FGDC, does not have resources to maintain the NAP at this time, so it will not be updated to harmonize with the new release of 19115-1 for the foreseeable future. Differences between 19115:2003 and NAP are described at ftp://ftp.ncddc.noaa.gov/pub/Metadata/Online_ISO_Training/handouts/Comparison_between_NAP_and_ISO.pdf

19115:2003 was extended (Part 2 was created) to better describe data from remote sensing platforms, specifically to identify elements for imagery and gridded data. This extended RSE (remote sensing extension) profile of 19115:2003 is referred to as 19115-2 or 19115 Part 2.

19115-1 and 19115-2 are two separate but overlapping standards, each with their own review schedule. For brevity, I may refer to them as 'Part 1' and 'Part 2'. It is not clear when 19115-2 will be revised.

However, when Part 2 is revised, it will likely continue to maintain the extensions that required its creation and remain a separate but overlapping standard with 19115-1.

19139 is the xml representation of 19115:2003. It is currently being revised to harmonize with 19115-1. Not clear about how the 19115-2 XML representation relates to the revision of 19139, when a revised 19139 will be released, or how it will be named or numbered.

The Marine Community Profile version 1.4 (MCP) and the WMO Core Metadata elements are profiles of ISO19115, so there is an inherent relationship to the ISO standards. Other widely used metadata documentation representation standards are now mapped to the ISO19115/19139 representation, including SeaDataNet Common Data Index (CDI) metadata, US Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM), and GCMD Directory Interchange Format (DIF). While each of these metadata representations are implemented using a functional infrastructure to maintain the content, discovery and access to data may be accomplished using other tools that operate on metadata represented as ISO19139 XML when metadata are translated from CDI, FGDC, or DIF to ISO.

Controlled vocabulary/thesaurus/ontology methodologies

Maintaining a controlled vocabulary term is very simple if it does not have to match any other term in any other context. Maintaining a vocabulary to be interoperable and that translates well to other vocabularies can be difficult and labour intensive. Managing an ontology to maintain linkages between terms in different concepts increases the challenges.

The Team looked at the SeaDataNet model for managing vocabularies and ontology relationships. The infrastructure is well managed and the SeaDataNet community is to be commended for this substantial effort. The Team does not have an assessment or report on the scalability of the SeaDataNet model to include non-SeaDataNet participants. In other words, it is not clear at this time how or if the SeaDataNet model for managing vocabularies could be replicated or implemented by another Program, Center, portal manager, or data provider.

The Team compared terms in a SeaDataNet vocabulary with those in an Ocean Data Portal vocabulary. There was a very high degree of correlation between the two vocabularies, but some discrepancies. In another instance, SeaDataNet, US NODC and the International Council for Exploration of the Seas (ICES) now share a common system to maintain platform identifiers (ship names/codes). While some content discrepancies were introduced prior to fully implementing this shared system, the system now in use works very well, with the opportunity for all participating members to provide additional information about new or existing platforms.

In each of these cases, a key element is a shared data model and database infrastructure managed by a designated entity with a well defined governance model. However, content management responsibility (e.g., information attributes for a ship) is shared across the entire community. This type of model should be examined more carefully to better understand how to improve vocabulary and ontology governance and management to improve data discovery, exchange, and interoperability.

Future work

Many challenges remain for metadata management, but the geospatial data management community has already begun to coalesce around using ISO19115/19139 and several other ISO standards (e.g., ISO3166, ISO8601). Comparing and matching terms in various controlled vocabularies, thesauri, and ontologies remains a significant hurdle to data discovery and interoperability. The newest revision to ISO19115, designated ISO19115-1 and expected to be approved in December 2012, includes new information elements to support better linkage between vocabulary terms and the ontology from which it derives.

Summary review by task

Task 1. Review and become more familiar with ISO19115 and related standards. The Team reviewed standards documentation acquired by Ms Scott as well as other resources, including the wiki maintained in the US by the NOAA National Geophysical Data Center (https://geo-ide.noaa.gov/wiki/index.php?title=Category:ISO_19115). This wiki site provides supplemental information about the ISO19115 metadata standard elements and best practices for using those elements.

As noted on the Ocean Data Standards website at http://www.oceandatastandards.org/index.php?option=com_content&task=view&id=4&Itemid=8, the ISO19139 schemas are now publicly available via the ISO and the Open Geospatial Consortium.

Task 2. Review SeaDataNet metadata management structure and techniques. Ms Scott discussed SeaDataNet metadata management structure and techniques with Mr Roy Lowry, BODC. Ms Chen provided a useful review comparing high-level components of the Marine Community Profile (MCP), SeaDataNet Common Data Index (CDI) and WMO Core Profile.

Task 3. The Team did not have the resources to investigate various semantic metadata management systems currently in use. As noted above, the Team reviewed some of the capabilities currently provided by SeaDataNet and the ODP, but did not develop a recommendation for this Task.

Task 4. The Team confirms that the ISO19115/19139 standards are becoming the de facto standard metadata representation for data discovery and exchange through common protocols. The ETDMP should continue to monitor the implementation of improved crosswalks from other standards and other developments for monitoring metadata management (e.g., the NOAA/NGDC 'rubric' for assessing ISO metadata completeness). Based on the efforts to assess vocabularies and ontologies management tools, the Team suggests that the ETDMP continue to be aware of existing and new resources, such as the SKOS implementation used by BODC/SeaDataNet.

FUTURE ACTIONS

Mr Collins concurred with earlier discussions within the ET that a goal for all of the Task Teams should be to improve communications between the teams. He suggested that a

quarterly or semi-annual email check-in with the ODS and ODP task teams at which progress can be described, new priorities can be discussed and issues can be resolved would be very helpful.

Tasks outlined for the 2012-2014 intersessional period are:

4.4.1 **Survey existing commonly used controlled vocabularies for platform types, organizations, projects, instruments, and keywords to establish recommendations for available resources**.

Deliverable: Prioritized list of recommended existing, available controlled vocabularies for at least the following descriptive elements: platform types, organizations, projects, instruments, and keywords.

NOTE: As discussed during the meeting, the concept of "keyword" is the most nebulous and difficult of these vocabularies to define or implement. In part, this is because there is little agreement on the granularity of the concept that a keyword should describe. The Task Team will review several 'keyword' vocabularies, such as those used by WMO, GCMD, SDN to discuss with the ODP team during the intersessional period.

4.4.3 **Task team to learn more about SKOS, Marine Metadata Interoperability program, and/or other existing tools for controlled vocabulary content management**.

Deliverable: Report summarizing capabilities of existing tools for controlled vocabulary content management.

The detailed work plan is included under agenda item **10.2**

5. OCEAN DATA PORTAL

PROGRESS REPORT

This Agenda Item was introduced by Dr Sergey Belov.

The progress report of the Task Team for ODP is shown in Table 4.

Action	**Task**	**Deadline**	Who	**Achievements**
1	Main requirements of the ODP V2 for ODS	May 2010	Sergey BELOV, Mathieu OUELLET, Anyuan XIONG	Priorities for ODS were identified by the IODE Ocean Data Portal: (i) date, time, lat/lon; (ii) platform. Instruments, organizations, parameter dictionary, projects; (iii) applying of OGC standards. Proposal was sent to TT for ODS
2.1	Ocean Data Portal V2 technical specification whitepaper (draft)	June 2010	Sergey BELOV	Paper was presented on SG-ODP, February '12
2.2	Technical specifications on ODP V1 – SeaDataNet	June 2010	Sergey BELOV, Dick Sharp	Draft specification been presented on SDN meeting in 2011. Final arrangements and agreements have been made

	interoperability			upon last SDN TTG meeting in September 2012. Specification to be released by the end of 2012.
2.3	Technical specifications on ODP V1 – WIS interoperability	June 2010	Sergey BELOV, Nikolay MIKHAYLOV	No longer required due to ODP V2 endorsement
2.4	Ocean Data Portal V2 technical specification whitepaper (final)	September 2010	Sergey BELOV, Nikolay MIKHAYLOV, Mathieu OUELLET, Anyuan XIONG	To be completed by IODE-XXII - PENDING
3				
3.1	Document on migration of the ODP metadata into the ISO 19115 standard	June 2010	Sergey BELOV, Mathieu OUELLET, Anyuan XIONG	Draft version including mapping table for ODP metadata format and ISO 19139 on released on September '11
4	**Revised technical documentation on the ODP components (Wiki, documentation on Integration Server, Data Provider & Light Data Provider)**	**November 2010**	Sergey BELOV	
51.	**The ODP V.1. software development**	**October 2010**	Sergey BELOV	Completed October '10. Updates applied for ODP V1 Portal, Integration Server and Light Data Provider at IODE PO.
5	**ODP V1/V2 toolbox**		ODP development team (lead by S.BELOV)	Funds were rearranged to meetings/trainings.V2 toolbox is completed. Documentation in process.
5.1	ODP V1 - V2 metadata conversion service	Feb 2011	ODP development team (lead by S.BELOV)	Completed September '11
5.2	ODP V2 Integration Server	May 2011	ODP development team (lead by S.BELOV)	Completed October '11
5.3	ODP V2 Data Provider	May 2011	ODP development team (lead by S.BELOV)	Completed October '11

5.4	ODP V2 Portal toolkit (alpha)	September 2011	ODP development team (lead by S.BELOV)	Completed May '12
6.	**Interoperability components**			
6.1	Joint ODP – SDN communication service	End of 2010	ODP development team (lead by S.BELOV)	no longer required due to ODP V2 endorsement
6.2	ODP – WIS communication service	End of 2010	ODP development team (lead by S.BELOV)	no longer required due to ODP V2 endorsement
6.3	ODP – OBIS communication service*	September 2011	ODP development team (lead by S.BELOV)	NOT DONE
7.				
7.1	GTSPP data, ISDM, Argo (to be further discussed), Japan (starting), China (to discuss), other ODINWESTPAC (to discuss), IMOS (starting), WODB (to discuss with K. Casey), US-NODC (to discuss), ODINCARSA-LA (to develop), ODINAFRICA (as from 2011), SeaDataNet (to develop), other regions?	May 2010	Mathieu OUELLET, Anyuan XIONG, S.BELOV & ODP development team	GTSSP data (US NODC, ISDM) available since May '10; ISDM data available Oct '10 (new contributions under consideration); ARGO data available since March '12; China (NMDIS) data available since Oct '10;

Table 4: Progress Report of the Task Team for ODP as adopted by ETDMP-II

During the intersession period main activities were focused on ODP V2 implementation and new data providers involvement. Below the current status (listed by countries and projects) on new data submission is presented:

- USA (US NODC): New GTSPP data according inventory update (for 2011 and 2012).
- Canada (ISDM): Surface drifters data submitted.
- Japan (MIRC): No data submissions due to pending software update process.
- IMOS: No actions have been undertaken.
- Latin America: After the training courses held in the July 2011 (Buenos Aires, Argentina) and installation of the IODE ODP Argentina node (Integration Server, Light Data

Provider, and Portal services) the Ministry of Science, Technology and Production Innovation (MINCyT) in Argentina took the lead in the establishment of the national data provider nodes and further contribution to the IODE. Future data providers will be presented by the Ministry's Information Systems Department and from other centres that produce sea data such as the National Research Institute on Fishery (INIDEP), the Argentinean Antarctic Institute, and some Research Institutes and Universities with oceanographic research activity. First Argentinean Data Provider in Patagonia (CENPAT) has been established. Process is pending due to the renovation of the hardware in the MINCyT and formal approval of the national programme on the governmental level.

- Africa: No actions have been undertaken.

- China: No actions have been undertaken. Existing infrastructure used for the Data Provider is not sufficient to host the ODIN Westpac ODP regional node if it will be planned.

- EU: Argo data (IFREMER) data provided from GDAC FTP via IODE PO Light Data Provider.

- ODINBlackSea: MHI – drifter profile data has been submitted.

ODP V2 STATUS AND IMPLEMENTATION

5.1.1 ODP V2 OVERVIEW

Scope

The objective of the ODP (IODE-XIX, res. 19) is to facilitate and promote the exchange and dissemination of marine data and services.

The ODP is delivering a standards-based infrastructure to build and manage a distributed marine data network basing on collections and inventories of data/products of the data centers of the IODE, JCOMM and other IOC projects as well as the resources from other participating systems and also provide the discovery, evaluation (through visualization and metadata review) and access to data and products.

In general, the functional tasks of the ODP defined in the context of the system requirements, which had been formulated in:

- the IODE Ocean Data Portal concept paper adopted IODE-XIX;

- the ODP requirements and design decisions considered by ETDMP meetings, IODE Officers, JCOMM DMCG and other groups (especially under joint JCOMM/IODE ODP Pilot Project for WIGOS) and IODE sessions during 2007-2010.

Functional tasks

Functional tasks, implemented by ODP v2, briefly discussed below:

Task 1. Collection, download metadata/data/services (further, resources) and their integration:

- registration of the resources by participating data centres for exchange;
- download and maintenance of metadata, data and services from local data sources and (or) with prescribed data sources network and making them available for distribution;

***Task* 2**. Provide a single security policy:

– ODP user registration, maintenance of user account information, assigning user roles to authorize access to resources;
– implementation of single sign-on (SSO) of users on distributed ODP nodes;
– synchronization metadata about users, maintaining a consolidated user catalogue.

Task 3. Metadata management

– forming and supporting relevant sets of metadata categories:
  - Catalogue of ODP nodes and components in nodes;
  - Catalogue resources for search, access and retrieval of data/services from distributed and heterogeneous data sources;
  - Catalogue of resources for search, access and retrieval of data/services from distributed and heterogeneous data sources;
  - Catalogue of resource dissimilation for implementation of the accessing mechanism on a subscription basis;
  - Catalogue of users.
– implementing interfaces for metadata with external systems to access and retrieve data and services;
– synchronization metadata of ODP nodes and metadata consolidation, providing metadata storage and recovery;

Task 4. Data management
– dissemination of data and services on a subscription basis ("push") to authorized (internal and external) users (end-users or systems) under the Catalogue of resource dissimilation and specified conditions (resource content, the point of delivery, method etc.);
– access to data and services on request ("pull") authorized (internal and external users through Catalogue of resources and on-line specified criteria (subject, geography, time, data source, etc.));
– "caching" of the prescribed data to accelerate the access ability to resources, their storage and recovery in emergency conditions.

Task 5. System management:

– administration of processes of the data and service exchange
– monitoring the work of the ODP nodes and components in nodes;
– providing reporting on the status and performance of the system.
Providing the management of data and services:
– disciplines: oceanography, marine meteo and other categories in context ODP requirements;
– data format: alphabetic-numeric data, images and documents, spatial data.
– processing level: observation data, climate data, analysis and forecast data;
– temporal level: real-time and near real-time (up to 7 days from the observations), historical data (more than 7 days after the observations).
– data access policy: public data, confidential data.
– data source types: data files, DBMS, web- and geo-services. The system has a means of understanding the "tabular" data file formats by setting their structure;

ODP V2 functional model

In accordance with the existing IODE structure and taking account the IOC Strategic Plan for Data and Information Management the following schematic diagram of the ODP organization-functional model is given on Figure 1.

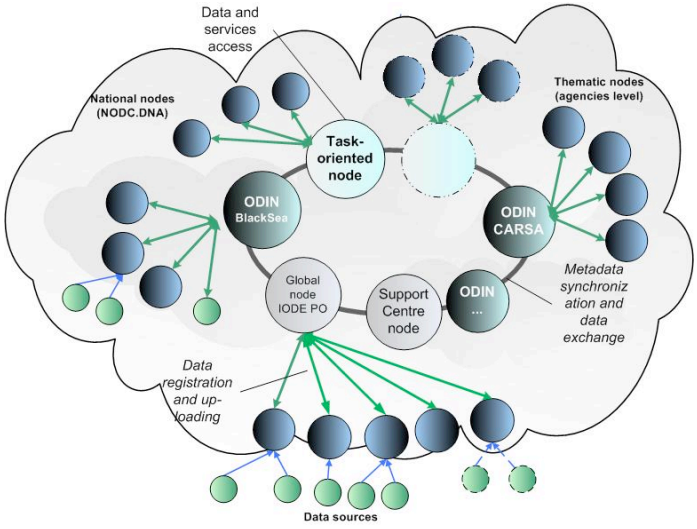

Figure 1. The vision of the IODE Data and Information System based on ODP V2

The IOC Member States and IODE centres participating in system implementation provide the operation of three types of ODP nodes:

- Global;
- Regional and Specialized;
- National,

The Global ODP node operates at the IODE Project Office and it's main task will be the coordination of the operation of the IODE marine distributed data and information system including the monitoring the system performance, dissemination of system statistics and reports.

The ODP technology is using the full metadata-driven approach through the series of catalogues. Those catalogues contain metadata on ODP components, data and services, users and user subscriptions, etc. It is designed that catalogues will be synchronized between all ODP nodes. Global ODP centre have responsibility to consolidate and back-up of synchronized catalogues of all nodes of the ODP.

Along with hosting of the catalogues Global centre will manage and disseminate the common controlled dictionaries, basic electronic maps and other cross-system data among other nodes. This ODP node will provide the user access to data and services submitted by all ODP nodes and redirects to portal of related nodes if it is required;

Users will communicate with the system via any ODP node portal to run data access services to search needed data/services by metadata catalogue, further making request to data/services, visualize data and invoke service automatically sourced from any nodes/data providers, download data to user computer if required. User (end-user or external system) can be subscribed on the needed data from distributed data system with data delivery to the specified point (FTP or email) and on given time schedule. The IOC data policy will be applied and an access to all resources of ODP will be provided through the global portal and portals of other nodes.

Components

The ODP technology can be used to build the national distributed data system of IOC Member State by means of establishing the ODP-based national oceanographic data and information system as it was considered earlier.

In this context, a unified system is a set of interacting components.

Component consists of a set of tools:

– telecommunication equipment (routers, connectors, firewalls, etc.);
– computing equipment (servers, workstations);
– software - operating system software, environment of operation (the application server, web-server, etc.), specialized software;
– information resources (databases and metadata).

Each component fulfils certain services grouped by following layers:
– interface layer (data exchange with data sources and other components);
– business logic layer (data conversion, metadata generation, etc.);
– presentation layer - a visual (tabular, graphical and cartographic) representation of information in graphical interfaces for ODP end users.

Every component has unique physical and logical addresses, identification and name, as well as the actual description in the metadata catalogue, including the specification of content lifecycle, interfaces, interactions and other properties. The component operations are recorded in the logs. Component interoperability means includes metadata and data specifications, exchange protocols, information and software interaction through the web-services and API (Application Program Interface) based on the technical specifications and standards like ISO 191xx and OGC.

Service bus is used to construct service chains from the components that are registered in the system for interconnection and inter-node communication.

From the practical point of view components are grouped into a hardware-software complex of the centre, consisting of computer equipment, software and general application components and they composed into the information-technology unit (ITU) of the system.

Within the ODP V2 the core component for interoperability and intercommunication is Service Bus. All ODP components are communicating with each other only through the Service Bus invocation process. Service Bus manage component service registry which includes not only local services, but also external ones to implement internodes synchronization and communication (ODP Global – ODP Regional, ODP Regional – ODP National, ODP Global – ODP National) and system-to-system communication model (like ODP-SeaDataNet, ODP-WIS, ODP-GEOSS).

After entering into the portal registered user is able to create own workplace that is handling some specific functionality by the selection of the portlets from the catalogue; create subscriptions for data delivery (to FTP or email), search metadata and make a query for the data online.

Metadata service handles harvesting process from the external metadata repositories (located in SeaDataNet, WIS, GEOSS) and conversion into the ODP ISO 19139 profile for further submission of the metadata & data into the ODP. It also implements metadata provision for the external systems (SeaDataNet, WIS, GEOSS, etc.)

Integration Server is core management unit within the node. It performs node management (data providers operability & accessibility monitoring), metadata harvesting, data request,

retrieval and collection (on demand or by notification from the Data Provider upon data update), metadata replication and backup, data replication & backup (for 24h cache), data dissemination based on users subscription (from the portal) and data delivery & distribution catalogue (for global and system exchange).

Data Provider is responsible for the local data set connection using variety of connectors – from the database, data files (structured and object), remote data files or inventories stored on HTTP/FTP, published OGC web-services.

Components required to control their operation and processes using remote logging (via the Service Bus). Accumulated logs are used to control and provide the fault-tolerant ODP node operation model.

ODP V2 enterprise architecture is presented in figure 2:

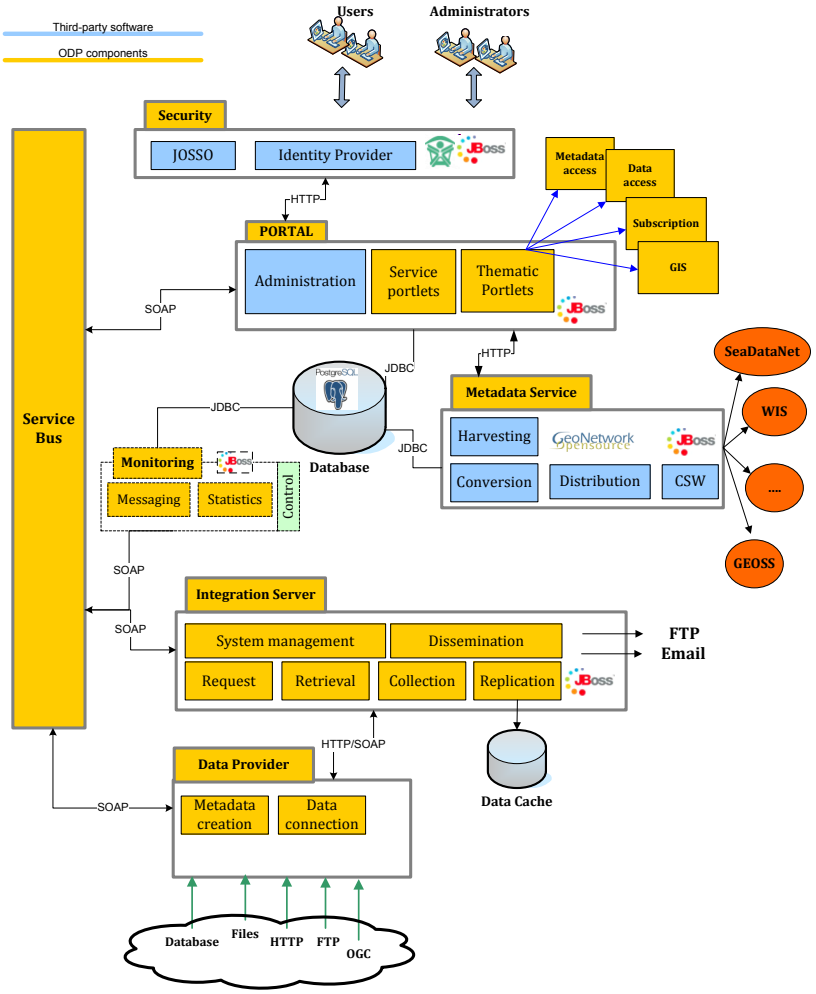

Figure 2 – ODP V2 enterprise architecture

Interoperability specifications

Interoperability specifications include solutions for metadata formats, protocols, information exchange and other means of interfaces between the components in the ODP node and between the ODP nodes. Below is a brief description of the specifications:

Identification

Following objects are uniquely identified in the system: ODP nodes, components, resources (metadata) and users.

To identify the ODP node following rule is applied: "<ODP>.<Organization acronym>.<node type>" Where:

- ODP – a constant for all ODP names;

- Organization acronym – the acronym of the organization, which is hosting or responsible for ODP global node operation, e.g. VLIZ;

- Node type – a type of the node (global, regional or national), i.e. "GLOBAL", "REGIONAL", "NATIONAL";

Examples: ODP.IODEPO.GLOBAL; ODP.NMDIS.REGIONAL.

- ODP metadata identification rules

To indentify the ODP metadata (resource) following rule is applied:

"<ISO country code>_<Data provider organization abbreviation>_<number>"

Where:

- ISO country code – two-letters country code (ISO 3166, http://www.iso.org/iso/iso_3166_code_lists)
- Data provider organization abbreviation – the acronym of the organization, which is responsible for the data submission;
- Number – metadata serial number (incremental).

Examples: RU_RNODC_01, AR_MINCyT_01, BE_VLIZ_01.

Data structures

ODP data model is based on the OpenDAP data structures with following types – point (DataPoint), profile (DataProfile), grid (DataGrid).

DataPoint record (record of point data) is a structure for the measured and processed single point data representation fixed on the space and time scale. For example: – GTS data from SHIP messages – water temperature, pressure, wind and wave in fixed sea points; – water temperature statistics, air temperature and etc. in the fixed geographical area (1-degree square, etc.) and date (year, month, etc.)

DataProfile record (record of profile data) is a structure for the measured and processed data in the point with fixed coordinates of X and T, and Z variables. For example: – temperature, salinity, and other parameter values at different depths – air pressure – water temperature statistics, air temperature and etc. at depths defined by X.

DataGrid record (grid data record) is a structure for the grid-oriented data representation obtained from data processing with the use of forecast/analysis models, field reconstruction models and etc. For example: – climatic data of temperature, salinity, and other parameters in the grid structure – prognostic data of water temperature, air temperature and other parameters in the grid structure.

DataObject – general structure for object data files, URI-resources or unrecognized by ODP services.

One local data system can constitute one or several data sources, i.e. generate one or several information resources. The information resource describes following aspects:

- thematic (sphere, process, parameters);
- processing level (observation data, climate, diagnosis);
- spatial and temporal coverage of data constituting resource;
- storage format type in a local data system (alpha-numeric structured, textual, graphic and spatial);
- storage system type of local data system (DBMS, file system, HTTP, FTP).

Within the physical data types ODP services are covering following:

- SQL-oriented databases (ranging from MS Access to Oracle);
- CSV-like structured data files (CSV, TSV and derivatives, GTSPP< ARGO inventory formats, etc.);
- Files stored on HTTP and FTP servers;
- Any unstructured data files (or unrecognizable by ODP services) – multimedia, documents, archives, etc.

ODP V2 supports following output data structures:

- NetCDF (CF-convention);
- ASCII;
- XML.

Metadata formats

Current ODP metadata model (http://nodc.meteo.ru/schema/e2edm/global/1.2/E2EDMGlobal.xsd) has a number of metadata class extensions as compared with the ISO 19115 and are not fully compatible with ISO. Within the ODP V2 internal metadata structures are used on the system level. For the metadata exchange ISO 19139 metadata standard is used with the following list of its profiles: MCP, WMO Core Profile, SeaDataNet CDI;

5.1.2 ODP V2 DISTRIBUTION

ODP V2 components are developed mainly using open source and free software.

The operating system is selected by open-source operating system (OS) Linux. For virtualization capabilities on servers is used free VMware ® ESX Server ™ - the operating system virtualization software. It allows sharing the physical machine into logical sections of the deployment components, known as virtual machines (VMs), and includes the management of virtual resources. Uniformity of virtual machine management is mandatory that allows to store VM images for backup and replication.

As the main database in the ODP nodes is used PostgreSQL, which has in its distribution package PostGIS spatial module to maintain spatial databases.

ODP V2 toolkit is a complete set of components used for “plug and play” of the ODP node. Specific composition of the ODP V2 components is building ODP node.

Integration, exchange and delivery:

- Data Provider;

Data contribution tool for ODP metadata creation and data connection from databases, data files, HTTP, FTP, OGC web services;

– Integration Server;

Metadata harvesting, data providers control, data delivery and distribution;

– Data Cache;

24h data cache for all data in the distributed system. Update using notification scheme from the data provider through the Integration Server.

Processing, analysis and presentation of information for decision-making:

– Portal – portal core environment and administration tools;

Data portal generally is a single point of access to the data and services of distributed data system. The ODP web portal server contains a number of services and solutions to search and discover data/services, provide data visualization, news and other relevant information to the user community. Portal also provides administrative functions for data/service providers and users through the user (end-users, external systems) catalogue and their account information.

– Thematic portlets – metadata search & browse, data access, news, display of operational alerts, , GIS viewer, etc;

Control and management of the system:

- Service Bus – dispatching of the component interaction, service registry and audit;

It also allows composition of basic and composite services using OASIS Business Process Execution Language – BPEL2, typically from multiple service providers. The orchestration engine is the service used to execute the resulting composite services.

- Security - authorization, authentication and accounting (AAA) of users;

User registration and management of their account records, identification and checking of a user's role, presentation of information on the user through access to registration repository.

- *Monitoring* - monitoring of computational and telecommunication resources;
- *Statistics* – reporting and analytics on system.

Adjustment of the services execution, access to the information on the data/service's status on time scheduling and regularities of their use, ODP statistics, the logging information, measurement of an overall performance of services, etc.

5.1.3 ODP V2 CAPACITY BUILDING

Within the ODP V2 the training of the new collaborative partners will consists of two items – electronic course using Ocean Teacher Academy, including supplementary materials as video guides, samples, etc. and practical live training courses hosted in the IODE PO or in the responsible side. Live trainings will be focused mainly on ODP V2 software usage and will differ from ODP V1 trainings that were focused only on Data Provider installation, maintenance and usage. ODP V2 toolkit for the trainings will be provided as "snapshots" (images of virtual machines) which makes deployment process easier and less time consuming. The installation process will require VMWare player (http://www.vmware.com/products/player/) to run provided images for each participant and not focus on middleware installation and configuration.

ODP V2 trainings are focused on several aspects:

- Establishment of the ODP V2 global node;
- Establishment of the ODP V2 regional nodes;
- Establishment of the ODP V2 national (data provider level) nodes;

Training for establishment of the ODP V2 global node

This training is focused on establishment of the ODP V2 global node hosted in the IOC Project Office for IODE (Oostende). Course includes a comprehensive number of topics concerning the ODP V2 software deployment and set up.

Target audience for this training course:

- IT-specialists responsible for the server maintenance, support (administrators);
- IT-specialists responsible for the ODP V2 software operation.

Number of days: 3

Course structure:

a) Structure and functionality of the ODP global node
b) Hardware requirements
c) Network requirements
d) ODP V2 toolkit package for ODP global node contents
e) Deployment of the ODP global node
f) Maintenance of the ODP global node

Training for establishment of the ODP V2 regional node

This training is focused on establishment of the ODP V2 regional nodes in ODIN's (ODINCARSA, ODINAFRICA, ODINWESTPAC, others). Course includes full set of practical tasks related to the hardware, software deployment and set up, ODP V2 components administration and usage, issues related to the connection of the regional data providers and support services.

Target audience for this training course:

- IT-specialists responsible for the ODP V2 software operation;
- OVP V2 regional node portal managers & content editors;
- data suppliers (e.g. individual data managers, database holders, etc.)

Number of days: 5

Course structure:

a) Structure and functionality of the ODP regional node
b) Hardware requirements
c) Network requirements
d) ODP V2 toolkit package for ODP regional node contents
e) Deployment of the ODP regional node
f) Maintenance of the ODP regional node
g) ODP regional node Portal management
h) Assistance for new regional data providers

Training for establishment of the ODP V2 national node

This training is focused on the establishment of the ODP V2 national node in countries connected to the regional nodes. Course includes full set of practical tasks for deployment of the data provider and connection to the regional or global node.

Target audience for this training course:

- IT-specialists responsible for the server maintenance, support (administrators);
- data suppliers (e.g. individual data managers, database holders, etc.)

Number of days: 3

Course structure:

a) Structure and functionality of the ODP national node
b) Hardware requirements
c) Network requirements
d) ODP V2 toolkit package for ODP global node contents
e) Deployment of the ODP national node
f) Data Provider training sub-package

Ocean Teacher ODP V2 preliminary course structure

1. Structure and functionality of ODP nodes

1.1. Contents of Global ODP node - *Data Provider, Integration Server, Data Cache, Portal, Thematic portlets, modeling tools, Service Bus, security, monitoring, statistics*
1.2. Contents of Regional ODP node - *Data Provider, Integration Server, Data Cache, Portal, Thematic portlets, service bus, security, statistics*
1.3. Contents of National ODP node - *Data Provider, Service Bus, Security*

2. Software requirements - *OS, Middleware, database, specific software*

3. Hardware requirements - *Server and virtual machines configuration*

4. Network requirements - *Configuration, routing between VM*

5. Structure of distribution packages - *Software package depending on ODP node type*

5.1. System software
5.2. Middleware
5.3. ODP software for global node
5.4. ODP software for regional node
5.5. ODP software for national node

6. Maintenance of ODP node - *Installation, testing, monitoring, reconfiguring, software updates*

7. TRAINING COURSE FOR GLOBAL NODE

7.1. Data Provider - *Usage and maintenance, case studies*
See Annex 1 for details
7.2. Integration Server - *Usage and maintenance, case studies*
See Annex 2 for details
7.3. Data Cache -*Usage and maintenance, case studies*
See Annex 3 for details

7.4. Portal - *Usage and maintenance, case studies*
See Annex 4 for details
7.5. Thematic portlets - *Usage and maintenance, case studies*
See Annex 5 for details
7.6. Service Bus - *Usage and maintenance*
See Annex 6 for details
7.7. Security - *User management, assigning roles and data access*
7.8. Statistics - *Users, data volumes, data delivery, etc.*

8. TRAINING COURSE FOR REGIONAL NODE

8.1. Data Provider - *Usage and maintenance, case studies*
See Annex 1 for details
8.2. Integration Server - *Usage and maintenance, case studies*
See Annex 2 for details
8.3. Data Cache - *Usage and maintenance, case studies*
See Annex 3 for details
8.4. Portal - *Usage and maintenance, case studies*
See Annex 4 for details
8.5. Thematic portlets - *Usage and maintenance, case studies*
See Annex 5 for details
8.6. Security - *User management, assigning roles and data access*
8.7. Statistics - *Users, data volumes, data delivery, etc.*

9. TRAINING COURSE FOR NATIONAL NODE

9.1. Data Provider - *Usage and maintenance, case studies*
See Annex 1 for details
9.2. Service Bus - *Usage and maintenance. See Annex 6 for details*
9.3. Security - *Users, data volumes, data delivery, etc.*

It was pointed out that, taking into account limited financial resources some of the training will be carried out by distance learning (including Webex). In this regard it was recommended to package training in short 2-3 hour blocks that can be attended by Webex or video-assisted training. In addition the Partnership Centre for IODE ODP will be able to provide assistance. Other courses will be organized part of OceanTeacher courses. It was noted that currently no courses have been planned.

A number of manuals and guides should also be developed and published.

5.1.4 ODP REQUIREMENTS AND EVALUATION CRITERIA – IODE QMF FOR NODCS

This agenda item was introduced by Dr. Nick Mikhailov.

He recalled that at IODE-XX (2009) and IODE-XXI (2011), the IODE Committee discussed the need to establish a quality management framework to ensure that NODCs are established and operate according to defined principles, including adherence to agreed standards and the requirements of the IOC Oceanographic Data Exchange Policy. Accreditation of data centres needed to ensure NODCs can provide quality data to meet the requirements of a broad community of users. IODE has obtained membership of the ICSU World Data System which will require NODCs to demonstrate their capability to meet ICSU certification requirements

IODE-XXI established an inter-sessional working group that was tasked to "identify a set of quality management criteria for IODE NODCs taking into account those defined for the WDS". The IWG has prepared a document that proposes IODE-QMF (current version 0.6). It addresses the implementation of quality management framework.

The QMF will be a significant "engine" for ODP and IODE data system operation. Accreditation should ensure in concern with ODP (additionally to IODE QMF v.0.6): (i) data@product submission into IODE data system; and (ii) carrying out the functions of regional or specialized or national ODP nodes. These are the deliverables identified in IOC Strategic Plan for ODP and IODE data system.

NODCs will need to fulfil a minimum set of requirements. Accreditation criteria cover:

- ORGANIZATIONAL FRAMEWORK
- QUALITY CONTROL AND MAINTENANCE
- USER ACCESS AND COMMUNICATION
- TECHNICAL INFRASTRUCTURE

Organizational framework

Criteria: Commitment to provide sufficient resources and plans to provide the operation of ODP/IODE Data System node

Accreditation Requirement: The IODE Data Centre shall provide declaration and evidence that it is hosted by a recognized institution to ensure long-term operation of ODP/IODE Data System node - regional or specialize or national (data provider)

User Access and Communication

Criteria: Committed to provide the operation of ODP/IODE Data System node (as defined at Infrastructure Framework criteria)

Accreditation Requirement: Describe and demonstrate facilities available at the IODE Data Centre for the providing the ODP node functions basing on own tools or "system to system" approach or remote ODP Data Provider or by means usage of ODP Tool Kit installed at IODE NODC. The IODE Data Centre should provide information and demonstration tests (set will be depend on node type) on:

- Metadata and data up-load into IODE Data System
- Maintenance of data Discovery-Access-Retrieval and other metadata catalogues
- User authorization and authentication basing on data policy
- User servicing
- System statistics/metrics indicating data usage

Technical Infrastructure

Criteria: Hardware (telecom, server) and software systems

Accreditation Requirement: Describe the data centre's operating environment (hardware, software). This should be appropriate to the provided services including ODP node.

Criteria: Security Policy outlining the infrastructure for protection

Accreditation Requirement: Describe the data holdings (including ODP resources) are protected from both malicious and accidental loss.

Dr Iona inquired about the possible node type of e.g. SeaDataNet contributors. Dr Mikhailov responded that SDN nodes could provide their data through SeaDataNet which will link to ODP via a system-to-system connection. However an IODE data centre may also provide data that it does not provide through SDN. In that case it will act as a national node.

The Expert Team noted the importance of clear use cases for the different ODP node types.

Dr Sun called attention to the potential data duplicate problem: one centre may provide the same data set to both a regional node and global node. Dr Mikhailov informed the Team that a list of data sets must be provided by each node. Rules will need to be established to ensure the same data set is not provided through different node types. It is also important to identify the "initial data set". In addition to this set there may be other versions. Also unique identifiers will need to be given to all data sets.

It was noted further that ODP nodes will need to be accredited. This is part of the new IODE QMF. In the case of regional nodes, national nodes will need to document their agreement for their data to be collected by a regional node. A manual will need to be prepared.

ODP AND OBIS

This Agenda Item was presented by Ward Appeltans.

By 2013 a report is expected that describes a strategy on integrating ODP and OBIS, and the performance indicator is a percentage of ODP data and services be made accessible through OBIS.

The ODP technical meeting requested that the cooperation between OBIS and ODP be discussed between the SG-OBIS (through its Chair), the ODP technical development team and the ODP project coordinator. So far this is delayed partly because OBIS is currently revising its (internal) data system architecture, and the interaction with external systems is not yet discussed. In addition, the unclear status of ODP v2 has not pushed the item higher up on the agenda.

Mr Appeltans stated that OBIS can provide metadata to ODP and a deep link to the data. Second phase could be provision of metadata but ODP could also use web services so ODP can display a distribution map of species. Another recommendation he made is for ODP to use Worms as taxonomic backbone.

Currently the ODP coordinator's role is shared between the OBIS project manager (Ward Appeltans) and the head of IODE. Mr Appeltans is also managing the IODE input for the iMarine project. This was regarded a temporary solution and needs to be further discussed at IODE-XXII. He called for a more substantive staffing for ODP.

It was recalled that the Partnership Centre for IODE-ODP, to be established by the Russian Federation in 2013, will be responsible for the technical coordination and development of training materials. The "marketing" of ODP will be the main task of the ODP project manager based at the IOC Project Office for IODE in Oostende, Belgium. Although this position was currently held by Mr Ward Appeltans it was recalled that this was only a temporary arrangement and a new position would need to be created.

The Expert Team agreed on the need to develop detailed Terms of Reference for the ODP Project Manager.

Recalling the need for good marketing the meeting stressed the importance of populating the portal. This would have to be a priority for the technical team in Obninsk and the manager in

Oostende. There were some "low hanging fruits" as discussed under Agenda Item 6. Also Australia would need to be contacted again. Active discussions would be needed also with SeaDataNet to achieve a system-to-system link between ODP and SDN. Further discussions on cooperation with SDN were covered under agenda item 5.5

The Expert Team stressed the importance of presenting a well-populated portal to IODE-XXII. It was recognized that, unless this would be achieved, the future of ODP would be uncertain.

ODP AND WIS

ODP contributes to the WMO Information System (WIS) as one of the WIS prototype components, which ensures the operation of the JCOMM Data Collection and Processing Centre (DCPC) of the WMO Information System.

- Metadata compatibility is provided by an ODP-WMO conversion service library
- Data access regulations are avoided as all provided data has open access
- Service interaction level is presented by GeoNetwork as a publicly available metadata catalogue and service for transferring accompanied data files to the GISC FTP

ODP AND SEADATANET

This Agenda Item was introduced by Dr Sergey Belov.

Scope and goals

The document "Technical Specifications of the IODE Ocean Data Portal and Sea Data Net interoperability" (draft version 1.1.a) has been last updated in September 2009. The document includes the following sections: Section 1 - Introduction. Analysis of technical compliance of the ODP and SDN based on the comparison of the systems is given in Section 2. The interoperability solutions as outcomes of the comparison of the ODP and SDN are given in Section 3. A proposal for establishing the ODP and SDN interactions is proposed in Section 4.

Outcomes of the document:

- It must be prevented that data centres have to install local components or make local configurations for both the SDN and ODP systems;
- Focus on the interoperability between the discovery and delivery mechanisms of ODP and SDN for datasets only, and not for other types of datasets;
- It is proposed to focus the challenge of interoperability between SDN and ODP on the interaction between systems based on interoperability of portal to portal interaction of systems

Goals to be achieved

- have the agreed interoperability rules and tools for interchange of metadata catalogues managed by the ODP and SDN to provide publishing of the data into the ODP/SDN distributed data infrastructure avoiding duplication of IODE data centres effort;
- manage common codes and dictionaries to carry out the ODP/SDN interactions basing SDN V1 procedures and tools;

- provide the agreed mechanism and procedures for authorization and authentification of users taking into account that users will have an access to the ODP and SDN data providers. User role mechanism should be base on the IOC/SDN data sharing principles and technical solutions developed by SDN;.
- allow agreed rules for metadata/data granularity for easy portal to portal interactions;
- communicate the participant groups (SDN Technical Team, JCOMM/IODE ETDMP) to discuss and resolve ongoing definitional and development problems.
- agreement of the data content for the ODP/SDN interchange and system communication operations as well as the maintenance team (participating data centres and their obligations) should be established

Proposed solutions:

- Arrange a mapping and transformation between the SDN CDI V1 metadata XML to the ODP metadata XML. This must also include a mapping between common vocabularies and other libraries such as EDMO and EDMERP;
- Arrange a method for assuring that the ODP/SDN portals always have the latest set of metadata from the other portal, taking into account new entries as well as updates of existing entries and deletions of existing entries. This includes arrangement at ODP/SDN portals for generating the latest set of metadata in agreed format (SDN or ODP), for exchanging between SDN and ODP;
- Arrange a services for retrieving metadata from the ODP and SDN as well (e.g. CSW, SRU).

Remarks:

Exchange aggregated metadata records from the SDN portal to the ODP portal, thereby reducing the number of metadata records to several thousands. For realizing an exchange with INSPIRE, MARIS has been working on an aggregation by discipline (= Common Vocabulary P081) and data centre (= EDMO code).

Problems to be solved:

- discovery metadata harmonization for ODP-SDN exchange;
- common vocabularies;
- arrangements of the procedures and services for ODP-SDN interaction

Metadata:

Mapping between the SDN and ODP metadata records upon inclusion. Implication of ISO 19139 CDI format.

The ISO19115 entity (class) of elements <descriptiveKeywords> has been extended. The entity <descriptiveKeywords> (short name <descKeys>) provides three metadata elements - category keywords, their type, and reference source. Type is subject matter used to group similar keywords. Just five types are specified by ISO 19115 (see table below):

Code	Type	Definition
001	discipline	keyword identifies a branch of instruction or specialized learning
002	place	keyword identifies a location
003	stratum	keyword identifies the layer(s) of any deposited substance

004	temporal	keyword identifies a time period related to the dataset
005	theme	keyword identifies a particular subject or topic

The list of keyword types has been expanded in CDI profile with the following SDN types: "parameter";"instrument", "project", "platform_class".

Keyword type "parameter" enables to insert in metadata and specify as metadata group the list of parameters contained in data set. Similar actions can be done with other keyword types.

ODP is using the WMO Core Profile keyword.

Common vocabularies

BODC Parameter Usage Vocabulary (P011) comprises to date more than 20 thousand parameter definitions. The CDI coding of parameters is done by including SDN Parameter Discovery Vocabulary (P021).

The selection of the parameters should be done within ODP to cover as much data within the SDN data sets. Within the ODP data sets main problem is with the climatological data (summary, average etc.).

ODP is using specific tag to identify the parameters to be met in data with respect to data granularity and the elements order within the output data file (NetCDF, ASCII).

Instruments and devices used for providing observations are specified in CDI by terms of the "SeaDataNet device categories" (L05) controlled vocabulary which comprises about 200 terms. There are several others vocabularies (L051-L057) related with instruments but presently this vocabularies being not used within CDI. The following extension of the ODP code lists for instruments and devices should be provided.

Procedures and services

Identify the procedures for:

- metadata exchange;
- codes and vocabularies update for inter alia lists for platforms, measurement devices, sea areas, disciplines, ship codes, countries, etc.;
- Identify the services for:
- User request transfer from ODP to SDN and vice-versa with respect of monitoring facilities;
- Metadata publication;
- Metadata harvesting.

Proposed solution

1. ODP will handle a conditional publishing of metadata sets as CDI records (ISO 19139 based). Conditions (geographical restrictions, parameters covered, etc) should **BE AGREED**;

2. ODP will provide a conditional harvesting and inclusion of CDI records into the ODP providing comprehensive conversion into the ISO 19139 (base ODP V2 metadata format). Conditions (harvesting protocols, frequency, list of metadata) should **BE AGREED**;

Current state of interoperability arrangements by ODP

- CSW service is online;
- Sample ISO 19139 ODP metadata records available for harvesting (CSW, OAI-PMH, SRU);

Current state of interoperability arrangements by SDN

- CDI ISO 19139 will released in the end of 2012.

Conclusion and outlook

ODP will handle a conditional publishing of metadata sets as CDI records (ISO 19139 based). Conditions (geographical restrictions, parameters covered, etc) should **BE AGREED**;

ODP will provide a conditional harvesting and inclusion of CDI records into the ODP providing comprehensive conversion into the ISO 19139 (base ODP V2 metadata format). Conditions (harvesting protocols, frequency, list of metadata) should **BE AGREED**;

November 2012 – list of agreed data sets

December 2012 – CSW services test

End of February 2013 – Two-way metadata exchange with data access facilities

The Expert Team agreed on the following actions: (i) present linkage between SDN and ODP at IODE-XXII (this may allow direct link to data, provided that the new SDN ISO profile is available before the end of 2012); (ii) transfer of user credentials creating a "circle of trust" between ODP and SDN (after IODE-XXII).

COLLABORATION PROCESS WITH OTHER PROGRAMMES AND ACTIVITIES

This agenda item was introduced briefly by Sergey Belov. He referred to the other sub-items under agenda item 5.

6. POTENTIAL COLLLABORATION WITH EUROGOOS

This agenda item was introduced by Dr Patrick Gorringe.

EuroGOOS is currently an association of national governmental agencies and research organisations, founded in 1994, committed to European-scale operational oceanography within the context of the intergovernmental Global Ocean Observing System (GOOS). EuroGOOS has 34 members, providing operational oceanographic services and carrying out marine research, from 16 European countries. The organisation is based on an agreement signed by heads of agencies, and is self-financed through annual member subscriptions.

EuroGOOS roles

- Promote the development of Operational Oceanography at European level
- Advancing European operational oceanography in GOOS
- Act as a strong counterpart to the European Commission and European agencies
- Coordinate increased collaboration and co-production between member institutes, in particular regarding the European data exchange

- Promotion of aid and capacity building i.e. sharing knowledge with other GOOSs

EuroGOOS is in the process of establishing a transformation of the existing informal association into a body with legal personality with a view to increasing its efficiency, improving its representation of members' views, and establishing the capacity to present project proposals and, if successful, to sign contracts or agreements in its own name (no more EuroGOOS/SMHI) with 3rd parties such as the EC, EEA, EMSA, who expect EuroGOOS participation in the future, but in a different way.

Therefore it has been agreed by the EuroGOOS members to establish an International Non-Profit Association (INPO).

The Association will be hosted by Belspo (Belgian Science Policy Office) in Brussels, Belgium. Dr Kostas Nittis (Greece) has been appointed as Secretary general for EuroGOOS as from 1 January 2013, replacing Hans Dahlin (Sweden).

Coordination

Very early on, EuroGOOS chose a user-driven bottom-up approach where the regional scale was the most appropriate scale for cooperation and co-production. EuroGOOS Regional Task Teams have built and continue to build Regional Operational Oceanographic Systems, ROOSs.

Six regional sea areas, ROOSs – Regional Operational Oceanographic Systems, have been defined with strong cooperation within these regions, enabling the involvement of many more regional partners and countries. The ROOSs form the basis of EuroGOOS work and are regarded as the operational arm of EuroGOOS. Ongoing projects, such as MyOcean, are highly dependent on the ROOSs work and in particular the delivery of oceanographic data and metadata from the ROOS regions to the overall system. The ROOSs are responsible for the collection of data to fulfill the aims of the regional service needs. Each ROOS has set up regional data portals where data (RT, NRT and archived) is available via ftp. Data is made available in ASCII, NetCDF and in some cases as ODV

There are three initiatives that closely relate to EuroGOOS:

SeaDataNet: A marine data service to provide access to archived multidisciplinary datasets of in situ observations relevant to the monitoring of the ocean state and health, in the form of single data and gridded fields for European seas.

GMES: A GMES marine service to provide free and open access to real-time and delayed mode « ocean monitoring and forecasting » information based on the combination of satellite, in situ observations and assimilative ocean models on the global ocean and European seas

EMODnet: A DG MARE marine service to provide free and open access to archived and real-time marine data from fixed stations and Ferryboxes on physical conditions in Europe's seas and oceans.

The ROOSs make oceanographic data available to EMODnet Physics, the European Marine Observation and Data Network Physical Parameters. The objective of EMODnet Physics is to provide layers of physical data and metadata and make it available to any relevant user. A portal is being developed and operated in cooperation with EuroGOOS, its regions, SeaDataNet and MyOcean. It provides access to an increasing number of Near Real Time and Archived data series from all fixed ocean monitoring stations and FerryBox lines in European seas.

EMODnet must be seen in the wider framework of Marine Knowledge 2020: "Marine Knowledge 2020 brings together marine data from different sources with the aim of: (i) helping industry, public authorities and researchers find the data and make more effective use

of them to develop new products and services; and (ii) improving our understanding of how the seas behave.". Preparatory actions towards Marine Knowledge 2020 include the set up of a ur-EMODnet prototype to provide access to observations and highlight gaps related to hydrography, physics, chemistry, biology, geology and habitats. This involves 52 organizations in 24 countries.

EMODnet Physics aims to bridge the communities behind EuroGOOS, MyOcean and SeaDataNet. It builds upon existing infrastructures / initiatives by adding value - not useless complexity. It aims to ensure access to data for any user. EMODnet Physics aims to attract data holders not yet participating in ongoing projects / initiatives including private companies i.e. oil companies. It covers measurements from fixed stations as well as from ferryboxes, from EuroArgo, gliders (GROOM) and HF radars.

Dr Gorringe ended his presentation with a few recommendations regarding building a portal:

- Don't reinvent the wheel
- Don't complicate things – its easy to complicate things, its much more difficult to make it easy
- Go for the low hanging fruit (i.e. EMODnet, SDN, GLOSS, GEOSS, NDBC, IMOS/AODN,……)
- Show how a data contributor will benefit from having his data in the portal
- Don't expect a data originator to adapt to your system – expect to adapt to their system
- Provide recommendations and guidelines
- Offer to assist
- Who are the users?
- The portal is a shopping window
- First step, get the metadata – link to the data
- Make it simple - Make it work!

Dr Gorringe expressed his interest and willingness for EuroGOOS to collaborate with ODP and to serve data to ODP. He would discuss this matter further with EuroGOOS partners. Similarly he would discuss possibilities with the Australian IMOS team.

The Expert Team requested Dr Belov and Dr Gorringe to implement the necessary actions to populate ODP with EuroGOOS data by IODE-XXII.

7. OUTCOME OF JCOMM-IV

This Agenda Item was introduced by Dr Sergey Belov. He recalled that the 4th Session of JCOMM was held in Yeosu, Republic of Korea, between 23-31 May 2012.

Under agenda item **7.1** (**Standard setting and documentation**), the Commission noted with concern that the process of receiving recommended standards from Member States has been very slow. The Commission stressed he importance of standards for all aspects of JCOMM's work and in particular to ensure interoperability arrangements between data systems such as the Ocean Data Portal (ODP) and the WMO Information System (WIS), and emphasized that the success of this process is highly dependent on active participation of all WMO/IOC Members/Member States, programmes and related organizations through submitting suitable standards for consideration. The Commission therefore requested Members/Member States to participate actively in submitting standard proposals through the ODS process.

Noting that additional standards have been identified for submission (i.e. Latitude, Longitude and Altitude (based on ISO 6709), Units (based on the International System, SI), Platform Types, Geo area (International Hydrographic Bureau, IHB), Instrument Types, Parameters, Institutions, and Cyclic Redundant checks (CRC)), the Commission requested Members/Member States to participate in identifying standard proposals for submission through the ODS process for wide community adoption. The Commission also encouraged Members/Member States to participate actively in reviewing the candidate standards.

Regarding JCOMM-III priority (ii), Development of Data Management Standards, which recommends Members/Member States to implement the recommended standards in agencies in their own countries at the earliest possible date, the Commission requested the DMPA to follow-up on the implementation of the recommended standards by Members/Member States.

Under agenda item **7.3 (JCOMM Data Management Practices: Achievements and Future Priorities)** the Commission had noted with appreciation the progress made by the Task Team on Metadata and requested the relevant ETDMP task team to continue the work on comparison of semantic metadata profiles (Marine Community Profile – MCP –, SeaDataNet Common Data Index – CDI –, and the WMO Core Profile) and make recommendations for better interoperability between ODP and WIS. The Commission welcomed the close and productive cooperation between IOC/IODE and WMO through the JCOMM Pilot Project for WIGOS, and congratulated the participating experts with the achieved results that will contribute to effective interoperability between WMO and IOC data systems. The Commission recommended to continue work on the interoperability of WIS/WIGOS and IODE ODP as these systems further develop and evolve. The Commission congratulated the Russian National Oceanographic Data Centre (NODC) for their considerable contribution towards the development of the IODE ODP as well as the JCOMM Pilot Project for WIGOS during the intersessional period. The Commission recommended that the work of WIGOS be as an interface of cooperation between the WMO WIS and the IODE ODP. The Commission noted with appreciation the ongoing development, by IODE, of a revised version of the IOC Strategic Plan for Oceanographic Data and Information Exchange (2013-2016) as well as a quality management framework for IODE National Oceanographic Data Centres (NODCs) which will be complementary to the WMO Quality Management Framework (QMF). Meanwhile, the Commission noted with concern the low number of data centres providing data through ODP and urged Members/Member State to actively participate in ODP. The Commission also called on other national, regional or international distributed ocean data systems to actively pursue interoperability with the ODP.

The Commission welcomed the offer by the Russian Federation for establishment of a Partnership Centre for IOC/IODE supporting IODE ODP in Obninsk as an "in-kind" contribution of the Russian Federation into the activities of the IOC and JCOMM. The Commission requested the IOC Secretariat to work with the Russian Federation to prepare agreements for the establishment of such a centre.

The Commission adopted Recommendation 7.3/1 JCOMM-4 – The IODE Ocean DataPortal (IODE ODP)

Rec. 7.3/1 (JCOMM-4) — The IODE Ocean Data Portal (IODE ODP)

THE JOINT WMO-IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY,

Noting the IODE OceanDataPortal (ODP) is operational and provides a mechanism to integrate marine data from a number of distributed sources both in the network of IODE NODCs and from other systems including JCOMM data systems;

Further noting that the IODE ODP was developed in close collaboration with, and with the guidance of the JCOMM/IODE Expert Team on Data Management Practices (ETDMP) and that IODE ODP technology was used in the successful JCOMM Pilot Project for WIGOS;

Considering the importance of interoperability between the WMO Information System (WIS) and the IODE ODP,

Recommends that:

(1) JCOMM projects and participating organizations (data centres) participate in the IODE ODP operation by providing access to their data resources;

(2) the IODE ODP Project works closely with the WIS to implement a connection between IODE centres participating in IODE ODP and meteorological centres using WIS to ensure mutual access to data and information in their respective data systems;

(3) DMPA and ETDMP further support and assist the IODE ODP operations and development including the technology infrastructure and training activities;

(4) IODE and DMPA to further develop synergies between ODP and WIS, especially in terms of (i) WMO and IOC data policies, and (ii) implementation of ODP and the implementation of WIS nodes so as to avoid duplication.

Under agenda item **7.5** the DMPA priorities for the next intersession period (2012-2017) had been adopted: The Commission endorsed the future priority activities for the next intersessional period for the Data Management Programme Area (DMPA) as described below, with no particular order:

(i) Continue to adopt standards/best practices for use by the marine meteorological and oceanographic community through the IODE-JCOMM Ocean Data Standards Process in support of the Global Framework for Climate Services (GFCS), the IOC-WMO-UNEPICSU Global Ocean Observing System (GOOS), IODE, and the WMO Integrated Global Observing System (WIGOS) implementation;

(ii) Assist in the further development of the IODE Ocean Data Portal, its linkages with other ocean data systems (e.g. SeaDataNeT, IMOS, OBIS, GEOSS), its interoperability with the WMO Information System (WIS), and its capacity development activities to ensure full participation of Members/Member States;

(iii) Develop a strategy and implementation plan in the next two years for achieving a vision for a new MCDS and start implementation preparation of the new JCOMM Marine Climate Data System (MCDS);

(iv) Improve the management of instrument/platform metadata;

(v) Organize the fourth JCOMM Workshop on Advances in Marine Climatology (CLIMAR-IV), possibly in 2014, and the fourth International workshop on Advances in the Use of Historical Marine Climate Data (MARCDAT-IV), possibly in 2015.

Under agenda item 12.4 the Commission adopted Resolution 12.4/3 on “Data Management Programme Area” .

Ms Iona recalled that the future priorities would include a linkage of IODE with the new MCDS and CMOCs. This would also include ODP. and that this topic will be discussed at the upcoming 4th Session of the ETMC (November 2012). Dr Mikhailov stated that a paper will be prepared for the ETMC meeting .

8. PARTNERSHIP CENTRE FOR IODE ODP – STATUS AND TASKS

In 2011 the National Oceanographic Committee of the Russian Federation adopted the decision to offer the establishment and hosting of the IOC Support Centre for IODE/ODP at RIHMI-WDC/NODC of Russia (Obninsk).

Objectives

- To maintain and develop the IODE ODP specifications and tools, coordinate the use of the IODE ODP technology for the distributed marine data system basing on the IODE data network, data sources from other IOC programmes, including JCOMM;
- To create, in cooperation with the IOC Project Office for IODE an enabling environment, and assist in strengthening the capacity of the IODE ODP nodes to manage marine data and products, and to provide the IODE ODP resources and services required by users;
- To assist with the coordination and monitoring of the implementation of the IODE ODP work plan as adopted by the IODE Committee.

Implementation

- Develop, host and maintain the tools and specifications of the IODE ODP for the portal and IODE data system operation;
- Assist lODE's ODINs, NODCs and other IODE ODP nodes to achieve their regional and thematic objectives;
- Develop, strengthen and maintain the IODE ODP data management training programmes and tools;
- Monitor and report on the IODE ODP portal tools and specifications used by the IODE ODP nodes;
- Provide an infrastructure to develop and test the web-based technologies and tools and also to generate new ideas and perspectives of the IODE ODP;
- Promote collaboration between relevant experts in integrated marine data management in IOC programmes and projects, other organisations and systems (e.g. OBIS, WIS, GEOSS)
- The offer includes office space, equipment and three staff positions.

The 45th Session of the Executive Council (June, 2012) accepted the offer (Decision EC-XLV/Dec.4.2.1: "*Invites the Russian Federation to consider entering into a partnership agreement with the IOC of UNESCO concerning this Centre with a view to exchanges of information and possible joint activities related to the Ocean Data Portal at RIHMI-WDC of Roshydromet in Obninsk*.) and instructed the IOC Secretariat to start negotiations with Roshydromet to conclude a formal agreement.

The IOC Secretariat prepared the draft of the Memorandum of Understanding on the "**Partnership Centre for the IODE Ocean Data Portal**" and submitted it for approval to Roshydromet.

Roshydromet is negotiating the memorandum with the Ministry of Foreign Affairs and the Ministry of Natural Resources of the Russian Federation. Comments were received from the

Ministry of Foreign Affairs and approval of the document by the Ministry of Natural Resources is expected.

RIHMI-WDC prepared and submitted to Roshydromet the business plan for the Partnership Centre for the IODE Ocean Data Portal, including the budget for the creation of the centre and its operation starting in 2013. The business plan is under consideration by departments of Roshydromet. The signing of the agreement is expected by 1 November 2012 together with allocation of the budget based upon the business plan.

The official opening of the Office is planned for mid-2013 taking into account the time required for the purchase of computer and telecommunication equipment, office preparation, and re-assigning of staff.

The Expert Team welcomed the pending establishment of the Partnership Centre for IODE-ODP and thanked the Russian Federation for the kind offer.

9. MEMBERSHIP OF THE TASK TEAM

This Agenda Item was introduced by the Dr Sergey Belov.

Dr Belov recalled the need to re-state the membership of the three Task Teams and agreed on the following:

Task Team for ODS

- Yutaka Michida (Leader)
- Paul Oloo
- Richard Crout
- Anyuan Xiong

Task Team for Metadata

- Donald Collins (Leader)
- Paulo S. Polito
- Jixiang Chen
- Ting Yu

Task Team for the IODE ODP

- Tobias Spears (Leader)
- Ward Appeltans
- Patrick Gorringe

Dr Belov recommended regular interaction by Webex rather than just one meeting every two years.

Dr Belov invited members of the three Task Teams to identify elements for the work plan of the next inter-sessional period.

10. WORK PLAN FOR THE NEXT INTER-SESSIONAL PERIOD

WORK PLAN FOR THE TASK TEAM ON ODS

Action	Task	Deadline	Who
1	Develop standards/best practices for submitted proposals in the marine community through the IODE/JCOMM Standards Process as outlined by JCOMM-IV and IODE-XXI	Continuous	YM, PO
2	Examine further the candidates of standards for 'Lat, Lon, Alt.' (based on ISO 6709); and units (based on SI), and seek appropriate persons and/or organizations that make proposals.	March 2013	YM, PO, Greg Reed
~~3~~	~~Encourage SeaDataNet, GE BICH, GTSPP, and MyOcean and other relevant bodies to submit their proposals to ODS. (prepare and distribute letters)~~	~~Continuous~~	~~YM, Secretariat~~
4a	Encourage, by preparing and distributing an invitation for submissions, JCOMM and IODE communities to submit proposals of standards for, i) Thematic codes like platform type, Geo-Area (IHB) and instrument type; Standard vocabularies for parameters, institutions, platforms/platform types and instruments; unique data tag, data exchange format,	Continuous	TT
4b	ii) Discovery metadata profile (e.g. MCP, CDI, WMO Core, NAP) which is ISO 19115/19139 compliant	Continuous	TT
4c	iii) Quality controls being implemented by QARTOD	March 2013	RC
5	Keep communication with ODP TT and Metadata TT respectively on standards process.	Continuous	YM
6	Submit draft recommendation for ODSBP with its ToR to IODE-22 and JCOMM MAN	March 2013 (IODE), February 2013 (MAN)	ETDMP Chair
7	Submit draft recommendation on standards that have passed review process to IODE-22 and JCOMM MAN.	March 2013, February 2013	ETDMP Chair
8a	Continue work to finalize the review of the QC-flag proposal i) Report on the discussion on the proposal at ETDMP-III to the upcoming IODE QC Workshop in Oostende	October 2012	CS on behalf of YM

8b	ii) Ask the authors to modify the proposal as suggested by the ad hoc ODS SG, and circulate the revised version (V1.3) to IODE Member States for comments	tbd	YM, PO
8c	iii) Publish and promote the recommended standards and best practices as appropriate	June 2013	TT, IODE Project Office
9	Review candidate standards submitted to ODSBP process	Continuous	TT
10	Implement the first **meeting** of the ODSBP Steering Group	Late 2013/early 2014, **tbd by IODE-XXII**	TT

From agenda item 3.3:

The Expert Team stressed that the QARTOD manuals referred to above could be excellent candidates for submission to the ODSBP.

The Expert Team recommended to include QARTOD in the list of relevant communities to be addressed by ODSBP, as referred to in the draft terms of reference of the ODSBP (see agenda item 3.1)

WORK PLAN FOR THE TASK TEAM ON METADATA

Action	Task	Deadline	Who
1	Liaise with ODS and ODP Task Teams on a regular and repeating basis	Continuing	MD-TT, ODS-TT, ODP-TT, ETDMP Chair
2	Review and compare priority vocabularies	Continuing	MD-TT
2(i)	Review and compare EDMO/SDN organizations list and ODP organizations list table structure; identify common elements; recommend required elements for identifying organizations; compare list contents, if resources allow	Dec 2012	MD-TT
2(ii)	Identify specific concerns related to platforms identification management between SDN, ICES, and ODP.	Dec 2012	Collins, Iona (for SDN), others as needed
2(iii)	Review and compare EDMO/SDN platforms list and ODP platforms list table structure; identify common elements; recommend required elements for identifying platforms; compare list contents, if resources allow		MD-TT
2(iv)	Review and compare EDMO/SDN instruments list and ODP instruments list table structure; identify common elements; recommend required elements for		MD-TT

	identifying instruments; compare list contents, if resources allow		
2(v)	Review and compare EDMO/SDN keywords list and ODP keywords list table structure; identify common elements; recommend required elements for identifying keywords; compare list contents, if resources allow		MD-TT
2(vi)	Review and compare EDMO/SDN projects list and ODP projects list table structure; identify common elements; recommend required elements for identifying projects; compare list contents, if resources allows		MD-TT
3	Recommend ways to use XML-based vocabulary management tools (e.g., SKOS, MMI)	Continuing	MD-TT
3(i)	MD-TT members familiarize with functionality of SKOS, MMI and/or other xml-based frameworks.	Continuing	MD-TT
3(ii)	Identify which, if any, of priority vocabularies listed in 2 are represented using standard XML markup (in SKOS, OWL, etc.)	Concurrent with review for each vocabulary in 2.	MD-TT

From agenda item 4.1:

The Expert Team recommended that attention should be given to providing a "clearinghouse service" that will inform users about existing controlled vocabularies and similar authority systems so as to avoid that groups will continue creating new such systems.

WORK PLAN FOR THE TASK TEAM FOR THE IODE OCEAN DATA PORTAL

Action	Task	Deadline	Who
Governance			
1	Review the ToR for SG-ODP and Partnership centre for IODE ODP	February 2013	ODP-TT, SG-ODP
2	Liaise and collaborate with other groups in order to establish strong links with existing regional and global initiatives	Continuous	ODP-TT
ODP management			
3	Describe the profile (responsibilities, tasks and competences) of the ODP project manager, For consideration at IODE-XXII and IOC GA	December 2012	ODP-TT – SG-ODP – IODE PO

4	Monitor progress on the ODP 2012-2013 workplan and advice the SG-ODP on changes if necessary	Continuous	ODP-TT
5	Assess the deployment of the ODP nodes with assistance of the Partnership Centre for IODE ODP	1Q 2014	ODP-TT, IODE PO, Partnership Centre for IODE ODP
Standards			
6	Liaise with ODS TT on standards and best practices related topics; identify, prioritize, and assign work activities resulting from discussions	Continuous, Quarterly webex calls	ODP-TT, ODS-TT
Metadata			
7	Liaise with Metadata TT on vocabularies and metadata related topics; identify, prioritize, and assign work activities resulting from discussions	Continuous, Quarterly webex calls	ODP-TT, MD-TT, Partnership Centre for IODE ODP
8	Revise and distribute the document on interoperability and migration of the ODP metadata into the ISO 19139 encoding in coordination with ETDMP TT for Metadata	January 2013	ODP-TT, MD-TT, Partnership Centre for IODE ODP
Data providers			
9	Identify and network with potential new data providers (projects, programmes and other communities)	Nov 2012, and continuous	ODP-TT, SG-ODP
9(i)	Identify and assess the contribution of the data from SeaDataNet	February 2013	ODP-TT, Partnership Centre for IODE ODP
9(ii)	Identify and assess the contribution of the data from EuroGOOS	February 2013	ODP-TT, Partnership Centre for IODE ODP
9(iii)	Identify and assess contributions from: NMDIS, NODC of Russia, US NODC, ISDM, IMOS, OBIS and other existing data providers	February 2013	ODP-TT, Partnership Centre for IODE ODP
9(iv)	Prepare a document “Technical specification on interaction with SeaDataNet, WIS, EuroGOOS, OBIS and ESIMO”. Distribute the document within IODE, JCOMM, SeaDataNet, WIS, EuroGOOS and ESIMO.	March 2013	ODP-TT, Partnership centre for IODE ODP
ODP Portal			
10	Identify and interact with the ODP user community (feedback/bug tracking)	Continuous	ODP-TT
11	Provide specifications for the ODP portal interface (features, functionalities, appearance, and user-friendliness – manual on how to use the portal)	December 2012	ODP-TT – SG-ODP

Capacity Building			
12	Revise and distribute the technical documentation on the ODP V2 toolkit components	March 2013	ODP-TT, Partnership Centre for IODE ODP
13	Identify and prioritize ODP training requirements	March 2013	ODP-TT, SG-ODP
14	Prepare "Manuals and Guides on IODE ODP"	Draft version should be presented at IODE-XXII (March 2013) Final version, June 2013	ODP-TT, Partnership centre for IODE ODP, SG-ODP
15	Develop documentation and guidance material for the training courses on ODP regional nodes for ODINs with assistance of the Partnership Centre for IODE ODP	End of 2013	IODE PO (OTA), ODP-TT, Partnership Centre for IODE ODP

From agenda item 5.3:

The Expert Team agreed on the need to develop detailed Terms of Reference for the ODP Project Manager.

The Expert Team stressed the importance of presenting a well-populated portal to IODE-XXII. It was recognized that, unless this would be achieved, the future of ODP would be uncertain.

From agenda item 5.5:

The Expert Team agreed on the following actions: (i) present linkage between SDN and ODP at IODE-XXII (this may allow direct link to data, provided that the new SDN ISO profile is available before the end of 2012); (ii) transfer of user credentials creating a "circle of trust" between ODP and SDN (after IODE-XXII).

From agenda item 6:

The Expert Team requested Dr Belov and Dr Gorringe to implement the necessary actions to populate ODP with EuroGOOS data by IODE-XXII.

From agenda item 8:

The Expert Team welcomed the pending establishment of the Partnership Centre for IODE-ODP and thanked the Russian Federation for the kind offer.

11. ADOPTION OF THE REPORT

The meeting agreed to adopt only the work plan in plenary and instructed the Secretariat to finalize the full report after the meeting and to adopt it by email. It was agreed that the draft

version will be prepared by 9 November 2012 and will be circulated to the ETDMP members for their final review and edits by 16 November 2012.

12. DATE AND PLACE OF THE NEXT SESSION

The Chair introduced this Agenda Item. The proposal is to have our next meeting in spring 2014 and possibly back-to-back with the GTSPP bi-annual meeting at the IOC project office for IODE in Ostend (Belgium).

13. CLOSING OF THE SESSION

The Chair thanked the Members of the Group for their active participation in this Session.

The Chair closed the meeting on 19 October 2012 at 14:27.

ANNEX I

AGENDA

1. OPENING OF THE SESSION

1.1. Adoption of the Agenda and Timetable
1.2. Working and practical arrangements

2. ETDMP PROGRESS REPORT 2010-2012 (Sergey Belov)
3. OCEAN DATA STANDARDS (Yutaka Michida)
- 3.1 OCEAN DATA STANDARDS PROCESS
- 3.2 PROGRESS REPORT
- 3.3 FUTURE ACTIONS

4. METADATA MANAGEMENT (Don Collins)
- 4.1 INSTRUMENT/PLATFORM METADATA
- 4.2 OTHER METADATA NEEDS AND INTEROPERABILITY ISSUES OF METADATA MANAGEMENT
- 4.3 PROGRESS REPORT
- 4.4 FUTURE ACTIONS

5. OCEAN DATA PORTAL (Sergey Belov)
- 5.1 PROGRESS REPORT
- 5.2 ODP V2 STATUS AND IMPLEMENTATION
  - 5.2.1 ODP V2 overview
  - 5.2.2 ODP V2 distribution
  - 5.2.3 ODP V2 capacity building
  - 5.2.4 ODP requirements and evaluation criteria IODE QMF for NODC's (Nick Mikhailov)
- 5.3 ODP AND OBIS (Ward Appeltans)
- 5.4 ODP AND WIS
- 5.5 ODP AND SEADATANET
- 5.6 COLLABORATION PROCESS WITH OTHER PROGRAMS AND ACTIVITIES (GEOS, GOOS, DBCP, etc.)

6. Potential collaboration with EuroGOOS (Patrick Gorringe)
7. OUTCOME OF JCOMM-IV
8. IOC/IODE Partnership Centre for ODP – status and tasks (Nick Mikhailov)
9. WORK PLAN FOR NEXT INTER-SESSIONAL PERIOD
- 9.1 ETDMP TASK TEAM FOR ODS
- 9.2 ETDMP TASK TEAM FOR METADATA
- 9.3 ETDMP TASK TEAM FOR ODP

10. DATE AND PLACE OF NEXT SESSION
11. CLOSING OF THE SESSION

ANNEX II

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ANNEX III

Resolution 12.4/3 (JCOMM-4)

DATA MANAGEMENT PROGRAMME AREA

THE JOINT WMO-IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY,

Noting:

(1) Resolution 3 (JCOMM-III) - Data Management Programme Area,

(2) The report of the chairperson of the Data Management Programme Area to the Commission at its fourth session,

(3) The report of the twenty-first session of the IOC Committee on the International Oceanographic Data and Information Exchange (IODE),

Considering:

(1) The need to implement, maintain and make available to users a fully integrated ocean/atmosphere data system,

(2) The requirement for the timely delivery of integrated data and associated metadata,

(3) The need to develop and maintain monitoring, evaluation and follow-up procedures,

(4) The need for common practices including quality control, metadata, analysis, data flow and data exchange standards, formats and procedures,

(5) The need to identify and as appropriate, rescue, digitize and archive historical data,

(6) The need to collaborate and coordinate closely with other programmes and bodies, both within and outside WMO and IOC, namely the Commission for Basic Systems, Commission for Climatology and IODE of IOC,

(7) The capabilities and experience of existing data management centres, systems and programmes, both within and outside WMO and IOC,

(8) The need to develop and/or strengthen national data management capacity, especially in developing countries,

(9) The successful ongoing collaboration between JCOMM and IODE of IOC,

Agrees that, to the extent possible, the work of the Data Management Programme Area should be implemented through specific, clearly defined, time-limited projects,

Decides:

(1) To re-establish a JCOMM Data Management Programme Area with the following components:

   (a) A Data Management Coordination Group;

(b) An Expert Team on Data Management Practices, co-sponsored by the IOC Committee on IODE;

(c) An Expert Team on Marine Climatology;

(2) That the terms of reference of the Data Management Coordination Group and the expert teams shall be as given in the annex to this resolution;

(3) That the general membership of the Data Management Coordination Group and the expert teams shall also be as given in the annex to this resolution;

(4) To select, in accordance with WMO General Regulation 32 and Rule 25 of the IOC Rules of Procedure, the following experts to serve as members of the Data Management Coordination Group:

(a) Sissy IONA (Greece) as chairperson of the Data Management Coordination Group and Data Management Programme Area Coordinator;

(b) After consultation with the Co-Chairs of the IOC Committee on IODE, Sergey BELOV (Russian Federation) as chairperson of the Expert Team on Data Management Practices;

(c) Nicola SCOTT (United Kingdom of Great Britain and Northern Ireland) as chairperson of the Expert Team on Marine Climatology;

(5) To select, in accordance with WMO General Regulation 32 and Rule 25 of the IOC Rules of Procedure, the following experts to serve as members of the Expert Team on Marine Climatology:

Shao Hua LIN (China)
Gudrun ROSENHAGEN (Germany): Vice-chair
Svetlana SOMOVA (Russian Federation)
David BERRY (United Kingdom of Great Britain and Northern Ireland)
Eric FREEMAN (United States of America)
Scott WOODRUFF (United States of America)

(6) To select, in accordance with WMO General Regulation 32 and Rule 25 of the IOC Rules of Procedure and in consultation with the IOC Committee on IODE, the following experts to serve as members of the Expert Team on Data Management Practices:

IOC-IODE selections (valid through IODE-XXII in first half 2013):
Sergey BELOV (Russian Federation)
Donald COLLINS (USA)
Yutaka MICHIDA (Japan)
Mathieu OUELLET (Canada)

JCOMM selections:
Paulo S. POLITO (Brazil): core member
Jixiang CHEN (China): core member
Paul OLOO (Kenya): core member
Richard CROUT (United States of America) : core member

Requests the Secretary-General of WMO and the Executive Secretary IOC to invite the Commission for Basic Systems, Commission for Climatology, IODE of IOC, directors of

relevant centres of the World Data System and other relevant organizations and bodies to participate in the work of this programme area as appropriate.

Annex to draft Resolution 12.4/3 (JCOMM-4)

TERMS OF REFERENCE AND GENERAL MEMBERSHIP OF THE COORDINATION GROUP AND TEAMS OF THE DATA MANAGEMENT PROGRAMME AREA

1. Data Management Coordination Group

Terms of Reference

The Data Management Coordination Group, in close collaboration with the International Oceanographic Data and Information Exchange (IODE) and Commission for Basic Systems subsidiary bodies and related experts, shall:

(a) Maintain a data management plan for JCOMM that identifies, assesses and specifies priorities and actions for the Data Management Programme Area;

(b) In concurrence with the Co-presidents of JCOMM and the co-chairs of IODE, establish and create expert teams, task teams, and pilot projects, as appropriate, to undertake the work of the Data Management Programme Area;

(c) Ensure collaboration, appropriate coordination and liaison with IODE as well as with the Commission for Basic Systems and other relevant bodies and activities external to WMO and IOC;

(d) Keep under review, assess and coordinate the adoption of appropriate new information technology;

(e) Establish and maintain cooperation with science programmes and assist with their data management activities, as appropriate;

(f) Provide advice and feedback to users of the Data Management Programme Area functions, through the appropriate JCOMM Programme Area, through IODE directly;

(g) Identify capacity development requirements related to the programme area and, as appropriate, coordinate activities to address these requirements;

(h) Identify requirements for satellite data and information related to the programme area.

General Membership

The membership is selected to ensure a range of expertise and to maintain an appropriate geographical representation, and includes:

(a) Data Management Programme Area coordinator (Chairperson of the Data Management Coordination Group);

(b) Chairperson of the Expert Team on Data Management Practices;

(c) Chairperson of the Expert Team on Marine Climatology;

(d) IODE co-chairpersons;

(e) Up to four additional experts with experience in the priority areas of oceanography and marine meteorology data management in the DMCG work plan;

Additional experts may be invited as appropriate, with the concurrence of the Co-presidents of the Commission, on a self-funded basis, and in general with no resource implications to JCOMM.

2. Expert Team on Data Management Practices

The JCOMM-IODE Expert Team on Data Management Practices, in close collaboration with JCOMM Programme Areas, Commission for Basic Systems subsidiary bodies, IODE officers and related experts, shall:

(a) Manage the process of adopting and documenting standards and best practices to be used in IODE-JCOMM data management through the Ocean Data Standards Process;

(b) Assist in the further development of the IODE Ocean Data Portal, its linkages with other ocean data systems (e.g. SeaDataNet, IMOS, OBIS, GEOSS), its interoperability with the WMO Information System (WIS), and its capacity development activities to ensure full participation of Members/Member States;

(c) Assist with the development, review and update the MCDS strategy, implementation plan and performance indicators in the next two years for achieving the Vision for a new MCDS

(d) In concurrence with the Co-presidents of JCOMM, the chairperson of the JCOMM Data Management Coordination Group and IOC-IODE officers, establish task teams and pilot projects, as necessary, to undertake the work of the Expert Team on Data Management Practices;

(e) Direct and coordinate the activities of the task teams and pilot projects referred to under (d);

(f) Provide advice to the IODE and the Data Management Coordination Group and other groups of JCOMM, as required;

(g) Liaise and collaborate with other groups as needed, to ensure access to required expertise, appropriate coordination and to avoid duplication.

Membership

The Membership is selected to ensure a range of expertise and to maintain an appropriate geographical representation, and includes:

(a) Up to five experts are selected by JCOMM, including the chairperson, selected from Members/Member States with an appropriate geographical representation;

(b) Up to four experts with relevant expertise based on the current work plans of the Task Teams and Projects established by the Expert Team on Data Management Practices, selected by IODE of IOC;

(c) One co-chairperson of the IOC Committee on IODE.

Additional experts may be invited as appropriate, with the concurrence of the Co-presidents of the Commission, on a self-funded basis, and in general with no resource implications to JCOMM.

Representatives of JCOMM Programme Areas, the IODE Committee, and other expert bodies may be invited as appropriate with the concurrence of the Co-Presidents of JCOMM and with no resource implications to the Commission.

(A) Representative(s) of the Expert Team on Marine Climatology (ETMC) should be invited, in order to ensure close collaboration and cooperation across the DMPA.

3. Expert Team on Marine Climatology

The Expert Team on Marine Climatology, in close collaboration with IOC-IODE, the Global Ocean Observing System, Global Climate Observing system, Commission for Climatology and Commission for Basic Systems subsidiary bodies and related experts, shall:

(a) Determine procedures and principles for the development and management of global and regional oceanographic and marine meteorological climatological datasets;

(b) Review and assess the climatological elements of the Commission, including the operation of the Marine Climatological Summaries Scheme and the Global Collecting Centres, and the development of required oceanographic and marine meteorological products;

(c) Review the Global Ocean Observing System and Global Climate Observing System requirements for climatological datasets, taking account of the need for quality and integration;

(d) In close cooperation with IODE and other appropriate partners such as the ICSU World Data System, to develop, review and update the MCDS strategy, implementation plan and performance indicators in the next two years for achieving the Vision for a new MCDS, based upon the results of the Workshop for a new Marine Climate Data System (MCDS1, 28 Nov.-2 Dec. 2011, Hamburg, Germany);

(e) Develop procedures and standards for data assembly and the creation of climatological datasets, including the establishment of dedicated facilities and centres;

(f) Collaborate and liaise with other groups as needed to ensure access to expertise and ensure appropriate coordination;

(g) Keep under review and update, as necessary, relevant technical publications in the area of oceanographic and marine meteorological climatologies.

Membership

The Membership is selected to ensure a range of expertise and to maintain an appropriate geographical representation, and includes:

(a) Up to eight experts, including the chairperson, selected from Members/Member States, representative of the range of responsibilities of the Expert Team. It is

expected that, in general, the Expert Team on Marine Climatology will be self-funding;

(b) Additional representatives from the responsible members for the Marine Climatological Summaries Scheme and the Global Collecting Centres, from the Services and Forecasting Systems Programme Area's Expert Teams on Waves and Coastal Hazards Forecasting Systems and on Sea Ice, and from relevant projects and subsidiary bodies of IODE of IOC, as required, in consultation with the Co-presidents of JCOMM;

Additional experts may be invited as appropriate, with the concurrence of the Co-presidents of the Commission, on a self-funded basis, and in general with no resource implications to JCOMM.

Representatives of JCOMM Programme Areas and of other expert bodies may be invited, as appropriate, with the concurrence of the Co-presidents and with no resource implications to the Commission.

(A) Representative(s) of the Expert Team on Data Management Practices (ETDMP) should be invited, in order to ensure close collaboration and cooperation across the DMPA.

ANNEX V

LIST OF ACRONYMS

AODC	Australian Oceanographic Data Centre
ASAP	Automated Shipboard Aerological Programme
ASCII	American Standard Code for Information Interchange
BODC	British Oceanographic Data Centre
BUFR	Binary Universal Form for the Representation of meteorological data
CDI	SeaDataNET Common Data Index
CSR	Cruise Summary Report
CSV	Comma Separated Values
DBCP	Data Buoy Cooperation Panel
DBMS	DataBase Management System
DBCP	Data Buoy Cooperation Panel
DCPC	Data Collection and Production Centre (of WIS)
DIF	Directory Interchange Format
DMCG	JCOMM Data Management Coordination Group
DNA	IODE Designated National Agency
E2EDM	End-to-End Data Management
EDIOS	European Directory of the Ocean-observing System
EDMED	European Directory of Marine Environmental Data
EDMERP	European Directory of Marine Environmental Research Projects
ETDMP	JCOMM/IODE Expert Team on Data Management Practices
ETMC	JCOMM Expert Team on Marine Climatology
FTP	File Transfer Protocol
GBIF	Global Biodiversity Information Facility
GCC	Global Collecting Centre
GCMD	Global Change Master Directory
GE-BICH	IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices
GHRSST	Global High-Resolution Sea Surface Temperature
GIS	Geographic Information System
GISC	Global Information System Centres (of WIS)
GLOSS	Global Sea Level Observing System
GOSUD	Global Ocean Surface Underway Data Pilot Project
GTS	Global Telecommunication System
GTSPP	Global Temperature and Salinity Profile Programme
HTTP	Hypertext Transfer Protocol
ICOADS	International Comprehensive Ocean-Atmosphere Data Set (USA)
IHB	International Hydrographic Bureau
IMOS	Integrated Marine Observing System (Australia)
IOC	Intergovernmental Oceanographic Commission of UNESCO
IOCCP	IOC International Ocean Carbon Coordination Project
IODE	International Oceanographic Data and Information Exchange (of IOC)
ISDM	Integrated Science Data Management (Canada)
ISO	International Organization for Standardization
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM in situ Observing Programme Support Centre
MCP	Marine Community Profile
MEDI	Marine Environmental Data Inventory (IODE)
META-T	Water Temperature Metadata Pilot Project

NDBC	NOAA National Data Buoy Center (USA)
NetCDF	Network Common Data Form
NMDIS	National Marine Data and Information Service (China)
NODC	IODE National Oceanographic Data Centre
OBIS	Ocean Biogeographic Information System (IODE)
OceanSITES	OCEAN Sustained Interdisciplinary Timeseries Environment observation System
ODAS	Ocean Data Acquisition System
ODASMS	ODAS Metadata Service
ODINBlackSea	Ocean Data and Information Network for the Black Sea region
ODP	IODE Ocean Data Portal
ODS	Ocean Data Standards
OGC	Open Geospatial Consortium
OPeNDAP	Open-source Project for a Network Data Access Protocol
QC	Quality Control
SDN	SeaDataNet
SOA	State Oceanic Adminsitration (China)
SOT	JCOMM Ship Observations Team
THREDDS	Thematic Real-time Environmental Distributed Data Services
TT	Task team
VOS	Voluntary Observing Ship
W3C	World Wide Web Consortium
WDC	World Data Centre (ICSU)
WESTPAC	IOC Sub-Commission for the Western Pacific
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization
WMS	Web Map Services
XBT	Expendable Bathythermograph
XML	Extensible Markup Language

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