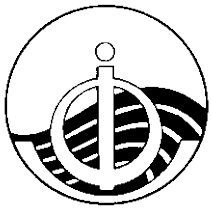
Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies



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

Second Session

IOC Project Office for IODE, Oostende, Belgium
6-7 April 2010

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TABLE OF CONTENTS

ANNEXES

1. ORGANIZATION OF THE SESSION

The Chair of the JCOMM/IODE Expert Team on Data Management Practices (ETDMP), Dr Nikolai MIKHAILOV, opened the Session on Monday 6 April at 09:20. He introduced the Provisional Agenda. 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 III.** The Session adopted the Agenda (attached as **Annex I**).

2. ETDMP WORK ORGANIZATION

2.1. ETDMP REPORT FOR 2008-2009

The Chair of the ETDMP reported on the activities of the Expert Team during the 2008-2009 referring to *Document JCOMM-IODE ETDMP-II/Doc. 2.1*. He explained that in 2008-2009 the main ETDMP activity was concentrated on:

(i) the finishing the E2EDM Pilot Project;
(ii) the establishment of the IODE/JCOMM Standards Process;
(iii) IODE Ocean Data Portal Project and the ODP - WIGOS Pilot Project

Dr Mikhailov noted that the most significant outcomes were achieved with the IODE Ocean Data Portal (ODP) which is being developed in two stages. The ODP V1 initial capabilities are based on the technical specifications and software of the End-to-End Data Management (E2EDM) technology which was developed by the JCOMM/IODE ETDMP and the Russian NODC (RIHMI-WDC, Obninsk) in 2005-2007. ODP (v2) will be fully compliant with international interoperability standards and tools. During the period 2007-2008 the ODP services were essentially improved and ODP (v.1.) operation was launched in 2009.

The design paper "Initial IODE Ocean Data Portal Architecture" was developed with proposals on the vision and overall architecture of the ODP (version 2), as well as on the operational aspects of development of the ODP version with full capabilities. The document~~s~~ were reviewed by the JCOMM DCMG-III meeting (March 2008, Oostende, Belgium) and the "Meeting of the Joint Steering Group for the IODE Ocean data Portal and the WIGOS Pilot Project for JCOMM" (September 2008, Geneva, Switzerland). The technical decisions for ODP (v.2.) were investigated during the Consultation Meeting on cooperation between the IODE Ocean Data Portal (ODP) and the Integrated Marine Observing System (IMOS) (February 2010, Hobart, Australia).

The most important problem for ODP at this moment is the small number data providers. It is expected that this will improve through participation from IODE data centres and through the ODP-WIGOS Pilot Project.

Two training courses have been organized to promote the establishment of ODP data nodes:

- Training Course on the Establishment of National OceanDataPortal nodes in the Black Sea region (ODINBlackSea), 20-21 March 2009, Obninsk, Russian Federation. Five NODCs/DNAs from Bulgaria, Romania, Russia and Ukraine participated;

- First IOC/WESTPAC Training Course for IODE Ocean Data Portal data providers, 31 August – 4 September 2009, Seoul, Republic of Korea. There were 10 participants from Indonesia, Japan, Republic of Korea, Malaysia, Thailand, and Vietnam.

Dr Mikhailov stressed that the ODP should be interoperable with other information systems. Following the IODE-XX recommendation IODE-XX.3 high priority has been assigned to the interaction with the SeaDataNet infrastructure (SDN) and WMO Information System (WIS).

The technical specifications of the ODP and SDN interoperability" were considered at the SDN Technical Team meeting (September, Nice, France, 2009).

The WIGOS Implementation Plan defines that ODP will play the role of DCPC under WIS.

The Workshop on the IODE Ocean Data Portal (v.1.) and WIGOS Pilot Project for JCOMM was held in Obninsk, Russian Federation, 18-19 March 2009. The outcome of meeting provided the basis to solve the ODP and WIS interoperability issues and to refine ODP version 1 and produce plans for ODP version 2.

The ETDMP Chair participated in establishing the JCOMM/IODE Ocean Data Standards Pilot Project which is aimed at developing a standardization process for ocean and meteorological data management. Dr Mikhailov remarked that the ETDMP will now play an important role in this Pilot Project by making the necessary arrangements to review and adopt the standards as well as to continue their management, including updating.

2.2. ETDMP BASIC TASKS FOR 2010-2011 AND WORK ORGANIZATION

The ETDMP Chair briefly reviewed the new ETDMP terms of reference and membership which were adopted by the IODE-XX session (May, 2009) and JCOMM-III session (November 2009):

(i) In coordination with the IODE Officers manage the process of adopting and documenting standards and best practices to be used in JCOMM/IODE DM;

(ii) Review and assess the effectiveness of end to end data management practices, including integration and consideration of new techniques and approaches;

(iii) In concurrence with the co-Presidents of JCOMM, chair of the DMCG and IODE Officers establish as appropriate Task Teams and Pilot Projects to undertake the work of the ETDMP;

(iv) Direct and coordinate the activities of subsidiary Task Teams and Pilot Projects;

(v) Provide advice to the DMCG and other groups of JCOMM and IODE, as required;

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

The Chair then briefly introduced the role of ETDMP in a few major IODE and JCOMM initiatives:

(i) IODE/JCOMM Ocean Data Standards Pilot Project: make the internal review of the standards at the "submitted" stage, regulate testing of the Standards Process on the "submitted", "proposed" and "recommended" stages and provide the relevant follow-up management on the "use" stage;

(ii) IODE Ocean Data Portal: WP1 – ETDMP members participate in the Steering Group; WP2 - development of the ODP standards is the full responsibility of the ETDMP. These standards should largely be based on results of the IODE/JCOMM ODS PP; WP3 – ETDMP plays a central role in the ODP

implementation developing (adapting exists) the ODP components and building the IODE distributed data system in close cooperation with the IOC Secretariat and IODE Project Office;

(iii) JCOMM Pilot Project for WIGOS: Deliverable 1 - define and agree on common standards and processes to manage the instrument/platform metadata to ensure consistent and better quality data to both the broad user and modelling communities. This work should be done in close cooperation with JCOMM expert teams (META-T, ODAS, VOS/VOSC and etc.); Deliverable 2 - build a distributed marine data system and provide its interoperability with WIS. The Ocean Data Portal (version 1) is used to establish the distributed marine data system basing on the IODE and JCOMM data infrastructure. Deliverable 3 – prepare and submit the ocean and marine meteorological standards to be adopted via IODE ODS Process.

(iv) IODE MEDI Programme: IODE-XX decided that the future development and administration of the MEDI should be managed by the ETDMP.

The Chairman noted that the above projects are aimed to develop methods and tools for marine data integration and sharing and therefore they are interconnected to a considerable extent. The basic points of interaction and complementary activities of the Pilot Projects are given below:

- The IODE/JCOMM Ocean Data Standards Pilot Project will provide the interoperability infrastructure for building the IODE ODP ("standards development package") and for implementing the JCOMM Pilot Project for WIGOS (" best practices and standards" and "making marine data systems and WIS interoperable ");

- The IODE ODP Project will provide the construction and operation of a distributed marine data system based on the IODE NODC/DNA network and this system and corresponding portal services will provide data and information exchange with WIS and other systems;

- Involving JCOMM data sources into the ODP distributed data system under the JCOMM Pilot Project for WIGOS will promote information completeness of the ODP system.

2.3. PROPOSED ETDMP WORK STRUCTURE AND ORGANIZATION

The ETDMP work structure and organization format is based upon Recommendation IODE-XIX.2 (Strategy and Structure of IODE Groups of Experts). The proposed ETDMP structure uses a task-oriented approach and it is proposed that it should include three elements:

- Task Team for Ocean Data Standards (ODS)
- Task Team for Metadata
- Task Team for ODP

The ETDMP Task Team for ODS will provide:

- The IODE Standards Process in the field of the ETDMP responsibility: to conduct the review and adoption of standards as well as to continue their management, including updating process;
- The contribution to ODP WP 2 (partly) i.e. common codes and dictionaries for ODP operations;
- Deliverables 1 and 3 of ODP-WIGOS Pilot Project.

Proposed composition:

- Yutaka MICHIDA (TT leader)
- Paul Ng'Ala OLOO (expert)

The ETDMP Task Team for Metadata will provide:

- The coordination and conducting of the collection, distribution, and archiving of metadata systems taking account the MEDI, META-T, ODAS, and other similar work that is carried out by IODE and JCOMM;

- The contribution to ODP WP 3 (partly) with respect to the connection of ODP distributed data system with metadata sets: data set, platform/instrument and etc. descriptions taking account metadata of ocean observing systems (DBCP, SOT, GLOSS, Argo, OceanSITES);

- Deliverables 1 and 3 of ODP-WIGOS Pilot Project.

Proposed composition:

- Nicola SCOTT(TT leader)
- Donald COLLINS
- Jixiang CHEN

The ETDMP Task Team on the ODP will provide:

- The IODE Ocean Data Portal (WP 2 partly and WP3);
- Deliverable 2 of the ODP-WIGOS Pilot Project.

Proposed composition:

- Sergey Belov (TT leader)
- Anyuan XIONG,
- Mathieu OUELLET

The ETDMP Task Team for ODP will constitute the "representatives of IODE/JCOMM ETDMP" in the membership of the SG-ODP as defined in Recommendation IODE-XIX.4. The meeting further noted that the Task Teams will be fully self-funded.

Experts are distributed to the task teams in accordance with their interests and professional capabilities. Each team is managed by a Team leader providing the coordination and management of the Task Team activity, including the links of the ETDMP with other similar projects, initiatives and systems in the field of the Task Team activity. The cross-coordination and management of the ETDMP activity as a whole are provided by the ETDMP Chair.

➔ **The Meeting decided** that specific tasks will need to be assigned to each Task Team as these teams will have a limited life span (2 years). (see Agenda Item 6)

3. OCEAN DATA STANDARDS

3.1. OCEAN DATA STANDARDS PROCESS

Mr G. Reed provided a brief overview of the IODE/JCOMM Standards Process referring to *Document JCOMM-IODE ETDMP-II/Doc. 3.1*. Mr Reed recalled that a joint IODE/JCOMM sponsored meeting was held in January 2008 to examine the potential for the development and acceptance of community wide standards for marine data and information management and exchange. The meeting developed a process to accept, evaluate and recommend proposals for community wide standards. This process is coordinated by the ETDMP.

The IODE Committee (IODE-XX) adopted Recommendation IODE-XX.2 - The Ocean Data Standards Pilot Project which encourages all IOC Member States, Programmes and relevant organizations to submit standards for consideration, to contribute to the evaluation process, and to adopt recommended standards.

JCOMM-III (4-11 November 2009) endorsed a number of priorities for the DMPA for the next intersessional period, including developing standards and best practices in the marine community through the IODE/JCOMM Standards Process. JCOMM-III also adopted Recommendation 7.3/1 (JCOMM-III) — Development of Data Management Standards which recommends Members/Member States (i) to submit their proposals to the JCOMM-IODE Ocean Data Standards Pilot Project (ODS) for wide community adoption; and (ii) to implement the recommended standards in agencies in their own countries at the earliest possible date.

The Process diagram is shown in Figure 1.

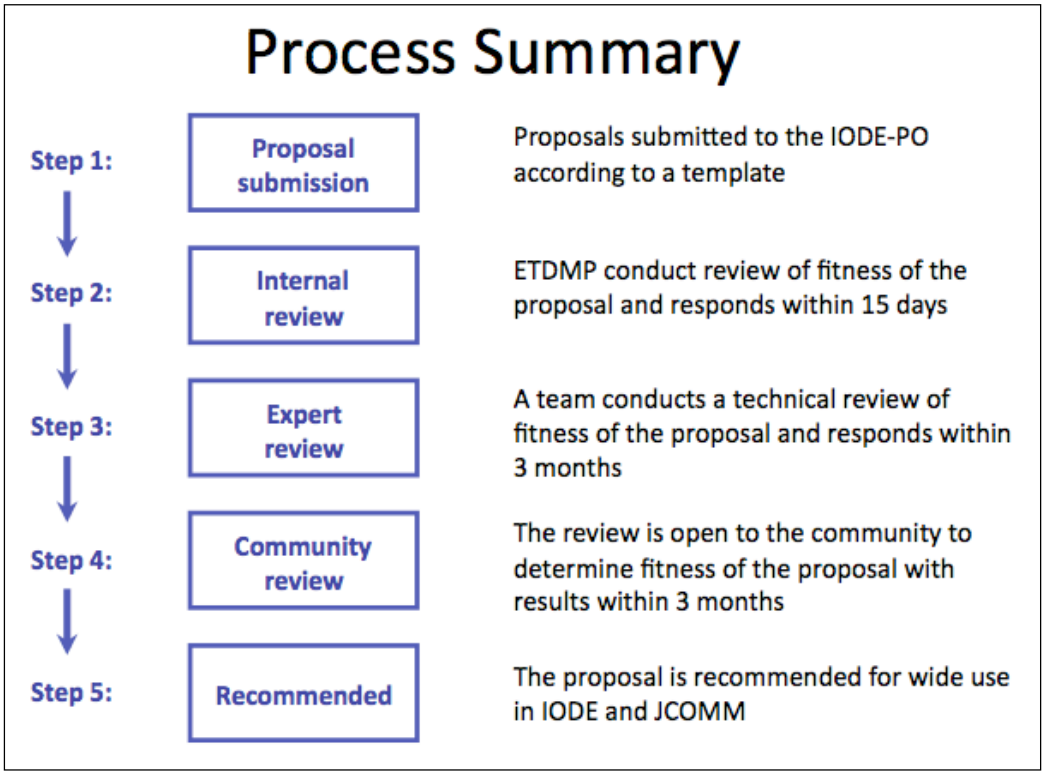

Figure 1: Ocean Data Standards Process Summary

A dedicated web site has been established: http://www.oceandatastandards.org

Mr Reed reported that, regrettably, to date only one submission has been received: Recommendation to Adopt ISO 3166-1 and 3166-3 Country Codes as the Standard for Identifying Countries in Oceanographic Data Exchange. This submission has passed through the expert review and community review and was subsequently published on 6 January 2010 as a recommended standard. The Standard has been published as IOC Manuals and Guides No. 54, Volume 1 (published 6 January 2010).

Additional standards have been identified for submission to the standards process. An invitation has been submitted to the SeaDataNet Technical Task Team to consider the following data standard submissions:

1. Sea Level Quality Control
2. CDI (Common Data Index) profile
3. CSR (Cruise Summary Report)
4. SeaDataNet device categories -L05
   (http://seadatanet.maris2.nl/v_bodc_vocab/welcome.aspx/)
5. ODV4 in ASCII format

At the IODE Workshop on QC/QA of Chemical Oceanographic Data (8-11 February 2010) it was agreed to submit the following proposals to the ODS process:

1. QC flag scheme from GE-BICH
2. QC flag scheme from GTSPP
3. QC flag scheme from MyOcean
4. A schema for five data processing levels for data management

Mr Reed noted that a problem night arise if the 3 QC schemes are submitted to the process. It will then be needed to look at commonalities between the schemes and possibly come up with a shortened list of QC flags.

Mr Reed stressed that the success of the Ocean Data Standards process is dependent on the submission of suitable standards for consideration. The ETDMP needs to follow up with SeaDataNet and GE-BICH to ensure these proposals are submitted. ETDMP could also play a more proactive role in soliciting standards submissions.

Mr Reed recalled the extensive list prepared by the 2008 meeting and called on the IODE and JCOMM communities to submit candidate standards.

➔ **The Meeting requested** the JCOMM and IODE Secretariats to widely publicize adopted standards in their respective communities in order to promote their utilization.

3.2. ODS CANDIDATES AND PRIORITIES, ETDMP CONTRIBUTION

This Agenda Item was introduced by Dr Yutaka Michida referring to *Document JCOMM-IODE ETDMP-II/Doc.3.2* (ODS candidates and priorities, ETDMP contributions).

As described in *Document JCOMM-IODE ETDMP-II/Doc3.1*, a joint IODE/JCOMM sponsored meeting was held in January 2008 to examine the potential for the development and acceptance of community wide standards for marine data and information management and exchange. The meeting developed a process to accept, evaluate and recommend

proposals for community wide standards. The result of the meeting was endorsed at IODE-XX by adopting Recommendation IODE-XX.2 - The Ocean Data Standards Pilot Project, which was then approved at the 25th Session of the IOC Assembly in June 2009 by endorsing the report of IODE-XX.

The Recommendation IODE-XX.2 invited all IOC Programmes and other relevant organizations to collaborate with the Ocean Data Standards Pilot Project, by submitting standards for consideration and contributing to the evaluation process, and urged Member States to play an active role in the Ocean Data Standards Process and to adopt recommended at the earliest opportunity.

IODE-XX also adopted Recommendation regarding ETDMP including its terms of reference, As a part of its tasks, ETDMP should coordinate a process of ODS Pilot Project to accept, evaluate and recommend proposals for community wide standards.

3.2.1. PROGRESS MADE REGARDING RECOMMENDED STANDARDS

UNESCO Manuals and Guides 54(1) 'Recommendation to Adopt ISO 3166-1 and 3166-3 Country Codes as the Standard for Identifying Countries in Oceanographic Data Exchange' was published on 6 January 2010 as a recommended standard after expert review and community review.

Some other standards have been identified for submission to the standards process, including QCs for some parameters.

3.2.2. STANDARDS TO BE IDENTIFIED

Additional standards to be identified are listed below together with potential candidates for them.

1. Date and Time (ISO 8601:2004)
2. Latitude and Longitude (ISO 6709)
3. Units
4. Platform/Instruments
5. Institutions
6. Ontology
7. Taxa
8. QCs (dependent on parameters)
9. Others (ex. Communication protocols, GIS standards,,,,)

3.2.3. FUTURE ACTIONS

The ETDMP needs to follow up with SeaDataNet and GE-BICH to ensure these proposals are submitted. ETDMP could also play a more proactive role in soliciting standards submissions.

The ETDMP may examine potential candidates for standards through the work of ODS Task Team (ODS-TT). The membership of ODS-TT should cover experts on ISO activities.

➔ **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.

Table 1 shows code lists currently used in the IODE Ocean Data Portal and the used standard.

Codifier	Number of codes	Standard	Description
Access constraints	2	ISO/TC 211	limitation(s) placed upon the access of the data (ISOTC211/19115 MD_RestrictionCode)
Authentication type	4	ODP	HTTP Authentication schemes: BASIC, FORM, CLIENT-CERT, NONE
Data frequency	16	ISO/TC 211	Frequency with which modifications and deletions are made to the data in the storage after it is first produced (ISO TC211/19115 MD_MaintenanceFrequencyCode)
Date&time type	3	ISO/TC 211	Defines type of the date for the metadata object: date that could be of creation, publication, or revision
Delivery form	5	ISO/TC 211	Function performed by the resource (ISOTC211/19115 CI_OnLineFunctionCode)
Distribution type	7	ISO/TC 211	Mode in which the data is represented (ISO TC211/19115 CI_PresentationFormCode)
Format name	23	ODP	Code list of the data formats supported by the ODP
Platform marine activity (directly)	47	SeaDataNet	(L061) SeaDataNet Platform Classes
Platform research marine activity	52	SeaDataNet	(L061) SeaDataNet Platform Classes
Processing level type	5	ODP	List of codes, representing data type - (observed data, climate, analysis, forecast or undefined)
Role	13	ISO/TC 211	Function performed by the responsible party (ISO TC211/19115 CI_RoleCode)
Security constraints	2	ISO/TC 211	Name of the handling restrictions on the dataset (ISO TC211/19115 MD_ClassificationCode)
Spatial resolution	5	ODP	Type of the spatial object, described in the metadata according to the geographic characteristics of the data (e.g. area, point, track, grid, undefined)
Temporal resolution	16	ISO/TC 211	Frequency with which modifications and deletions are made to the data after it is first produced (ISO TC211/19115 MD_MaintenanceFrequencyCode)

Units of measure	130	SeaDataNet+	
Use constraints	1	ISO	limitation(s) placed upon the use of the data (ISOTC211/19115 (MD_RestrictionCode)
Parameters dictionary	57	SeaDataNet+	Contains list of codes and names for the phenomenon parameters
Geographic areas names	250	IHB	List *of* Geographical Names for marine areas
Keywords	91	WMO	

➔ **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.

Mr Reed remarked that for organizations the IODE's OceanExpert system could be used and recommended.

➔ **The Meeting agreed** on a detailed work plan described under Agenda Item 6.2.

4. METADATA MANAGEMENT

4.1. INSTRUMENT/PLATFORM METADATA

Dr. Jixiang Chen was regrettably not able to participate in the meeting. Her presentation was introduced by Don Collins referring to *Document JCOMM-IODE ETDMP-II/Doc.4.1* (ODAS metadata status and plans).

At the First Session of the JCOMM Data Management Coordination Group (DMCG-I) in 2002, the National Marine Data and Information Service (NMDIS, China) volunteered to undertake the construction of the Ocean Data Acquisition Systems (ODAS) Metadata Service (ODASMS). The major objectives of ODASMS are collecting, processing, management and service of the ODAS metadata from the Members and Member States, international organizations and cooperative projects and programs in an operational way.

With the support of the State Oceanic Administration (SOA) of China and the efforts of the NMDIS, ODASMS has been developed fully for assembling, preserving and disseminating metadata on ODAS platform.

JCOMM-III (4-11 November 2009) had adopted Recommendation 7.1/1 (JCOMM-III) – Provision of ODAS and Water Temperature Metadata: Members/Member States (i) to record and provide to the ODASMS on a routine basis, appropriate metadata about ODAS platforms that they operate, and (ii) to provide to China and the US on a routine basis appropriate metadata about water temperature instrumentation that they use; (iii) China and the US to expand their Meta-T facilities to include the management of metadata related to other ocean variables than water temperature; (iv) the JCOMMOPS to routinely contact platform operators so that the metadata are being submitted to the ODASMS, including for operational platforms and for historical ones. JCOMM-III also agreed that the ODASMS take over

metadata formerly managed in the On-line Information Service Bulletin on Non-drifting ODAS operated by Integrated Science Data Management (formerly MEDS) of Canada.

4.1.1. STATUS OF ODASMS

ODASMS had collected over 10,000 records of metadata information from DBCP, Argo, GLOSS and other ocean observing platform. The main operational tasks of ODASMS are to transform the formats of the different platform metadata to the ODAS metadata. ODASMS also provides service of metadata information products for the requirements of users, especially the Chinese users.

Following ETMC-II recommendations, China and the US had begun cooperation on a second project to manage instrumentation metadata for water temperature observations (Meta-T), which had developed a prototype database, server and data assembly facilities.

Following the DMCG-III recommendations, NMDIS had taken over the information maintenance formerly managed in the "On-line Information Service Bulletin on non-drifting ODAS" operated by the Integrated Science Data Management (formerly MEDS) of Canada, and collected non-drifting ODAS metadata in the ODASMS database.

According to the adopted action item of DMCG-III, NMDIS have recorded the history of changes to platform metadata for ODASMS, and exchanged views with NDBC on this issue and made a consolidated proposal, and extended the ODAS metadata to address the platform types involved in the current ODAS metadata (not all kind). The procedures for members/Member states to apply for FTP access and submit the metadata are available on website.

Recommendations (see JCOMM-III 7.1/1)

- Members/Member States to record and provide to the ODASMS on a routine basis appropriate metadata about ODAS platforms that they operate;
- Members/Member States to provide to China and the US on a routine basis appropriate metadata about water temperature instrumentation that they use;
- The JCOMMOPS to routinely contact platform operators so that the metadata are being submitted to the ODASMS, including for operational platforms and for historical ones;

4.1.2. FUTURE ACTIONS

- Further study on the suitability of the current ODAS metadata format with the other kind of the platform types, when NMDIS really get the metadata of META-T.
- Collect the metadata provided by Members/Member States on a routine basis appropriate metadata about ODAS platforms that they operate;
- Collect the metadata provided by Members/Member States on a routine basis appropriate metadata about water temperature instrumentation that they use;
- Expand the facilities to include the management of metadata related to other ocean variables than water temperature (see JCOMM-III 7.1/1).

The Meeting recalled that the Recommendation by JCOMM-III referred to above, had not resulted in substantial submissions to ODAS. Also the META-T project, which had now been operating for four years, had not been very successful in this regard. META-T has

concentrated on making proposals to change BUFR template. This was done for VOS data, XBT data and is about to be done for buoy data. At the same time META-T proposed to establish 2 mirror servers: 1 in China at NMDIS and 1 in the USA at NDBC.

➔ **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.

➔ **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.

➔ **The Meeting agreed** on a detailed work plan described under Agenda Item 6.1. and Annex II.

4.2. DATA SET METADATA

This Agenda Item was introduced by Mr Don Collins. He recalled the history of MEDI. MEDI is a discovery tool for marine data based on GCMD DIF-format metadata. The DIF was mapped to ISO19115 by ETDMP in 2004-2006. The AODC led the development of an ISO19115 Marine Community Profile. Responsibility for further activity for MEDI was transferred to ETDMP by IODE-XX (para 247 of the Summary Report). Actions from the MEDI Steering Group included: (i) Review/recommend alternate authoring tools; (ii) Transfer existing MEDI metadata from DIF to ISO19115; (iii) Develop training materials; and (iv) Work with IODE ODP project to define requirements.

Mr Collins recommended that future work by the ETDMP should include the following:

- Review existing MCP for compatibility with North American Profile of ISO19115;
- Review existing metadata content creation and management tools;
- GeoNetworks, jMetaWriter, …;
- Publicize review and recommendations to JCOMM/IODE Members and Projects;
- Coordinate transition from MEDI/DIF to MEDI/ISO with IODE ODP requirements.

Mr Reed informed the Meeting that GeoNetwork is being installed at the IOC Project Office for IODE and should be operational by May 2010. This could then become a metadata entry tool for the IODE Ocean Data Portal.

➔ **The Meeting agreed** on a detailed work plan described under Agenda Item 6.2. and Annex II.

4.3. OTHER METADATA NEEDS (ORGANIZATIONS, OBSERVING SYSTEMS, ETC.) AND INTEROPERABILITY ISSUES OF METADATA MANAGEMENT

Ms. Nicola Scott was regrettably not able to participate in the meeting. Her presentation was introduced by Etienne Charpentier referring to *Document JCOMM-IODE ETDMP-II/Doc.4.3* (METADATA INTEROPERABILITY ISSUES).

There are two main types of metadata: Data Management (discovery) Metadata– this is information about the dataset as a whole (the who, what, where, when), & Semantic (platform/organisation/instrument/project…) Metadata – this is the information to help understand the oceanographic/meteorological data.

Today the desire to build regional and global marine distributed data systems, aggregating data from multiple sources is ever increasing. As a consequence the need for Data

Management Metadata, Semantic Metadata and data to be interoperable is also growing – but the reality with existing data systems is that this interoperability is not always easy or possible.

4.3.1. ISSUES

There are currently numerous bespoke ocean/met semantic metadata systems available throughout the world, including the likes of ODAS, Pub.47, MEDI/EDMED, GCMD, EDIOS & EDMERP. These have generally been developed independently without the use of common vocabularies and structure. As a result maintaining integrity to enable interoperability between semantic metadata systems, Data Management Metadata systems and the ocean/met data itself can be a complex task.

Section 3 of "Technical Overview of Ocean Data Portal" (WIGOS-2/Doc. 5.2) describes further information and issues with Ocean Data Portal data/metadata interoperability.

Currently within the oceanographic and meteorological community there are no set standards or protocol for developing Semantic Metadata systems so consequently integrity across different systems is often lacking. For example within different systems there could be database objects of same meaning but these may be stored in very different ways i.e. location could be stored as a spatial reference or alternately as a group of objects – latitude, longitude & quadrant. There are ways to remedy this by mapping different standards (GCMD has a webpage dedicated to mapping DIF to ISO and others) but this is an awkward work-around for systems already developed. It is not a long-term model for future developments to be based upon. It is therefore apparent that standards for Semantic Metadata (like for Data Management Metadata) need to be agreed and integrated within the community.

4.3.2. REQUIREMENTS

The ODP primarily uses Data Management Metadata to support searches through geospatial/temporal extents and parameter keywords. However, Semantic Metadata is also essential in providing greater functionality and providing users more information on data. Basic requirements for ODP Semantic Metadata are:

- Description of how the observation was taken (platform, instruments etc) and/or how the product was generated (method etc);
- Quality metadata is important to store information as to how the data should be used;
- Structure of local data collection (hierarchy, data elements etc) and data storage (DBMS, file system, GIS) specifications, local code systems and units/naming of data elements;
- Data and service catalogues (registers) to search for data/services and also building the chains of extracting and processing services that meets a user's needs and requests;
- Support versioning and lineage of data presented by data providers. Metadata should maintain reference information for data - reference documentation, bibliographic references and citation of the data. Potentially the metadata framework should allow archive users to publish findings on data;
- Provide data transport and assembly operations for access to data from ODP tools and enable time-defined transmission of data to users;

- Support ID/account information about the ODP users (it can be end-users and external systems, web applications or services) as needed for their authentication, authorisations and system reporting.

Additionally, to support machine-to-machine interoperability, distributed access to metadata should be as seamless as access to the data itself. To facilitate the use of distributed data sources, the metadata framework should provide transparent access to all the metadata fields, including those required to operate on the data in a semantically meaningful way.

To take full advantage of metadata stored within each system and to make access seamless, it is important that all SM systems are interoperable and of common structure. Semantic Metadata, Data Management Metadata and actual data must be interoperable to exploit all information fully.

The interoperability of semantic metadata needs to be such that, at least, the following are possible:

- Visualisation and layering of data/SM geospatially. To do this Semantic Metadata must be interoperable with the geographic data representation including images and spatial (GIS) data.
- Compatibility with the Ocean Data Portal's distributed data system mechanisms.
- The life span of data (raw data, QC'd data, end product) can be linked and viewed.
- All like-for-like objects within the different Semantic Metadata/Data Management Metadata and data systems are identified and mapped. It is essential that Data Management Metadata and Semantic Metadata can be linked so, for example, using the ODP you can click on platform or tools etc and be able to view all information about it.

4.3.3 FUTURE ACTIONS

A possible solution to this integrity and interoperability issue would be to identify a model structure for Semantic Metadata and to document suitable standards to meet the above requirements and, where possible, remain in line with the ISO 19115.

As there is still no dominant semantic metadata standard used by the ocean or meteorological community it is proposed that the following investigations be carried out by the task team to establish the best structure of Semantic Metadata system to be used.

1. Identify the most-used system by the scientific data management community.
2. Compare all systems identifying similarities and inconsistencies between metadata structure and content. Use this information to select the system that best suits the requirements of the entire community.
3. Define the most desirable common model using environment (ISO 19100 series) interoperability interface.

It has been noted that SeaDataNet have successfully developed a useful method to manage various Semantic Metadata/data systems. It would therefore be valuable to understand and document the structure, standards and approach used in this system.

With consideration for ODAS database management and META-T findings, results of all investigations should be documented by the task team and circulated amongst the rest of the ETDMP and subsequently the way forward should be proposed.

➔ **The Meeting agreed** on a detailed work plan described under Agenda Item 6.2. and Annex II.

5. OCEAN DATA PORTAL

5.1. ODP (V.1) CURRENT STATUS, THE ISSUES OF DATA PROVIDER AND INTERACTION WITH OTHER SYSTEMS

This Agenda Item was introduced by Dr. Sergey Belov referring to *Document JCOMM-IODE ETDMP-II/Doc.5.1* (IODE OCEAN DATA PORTAL (V.1) AND CURRENT STATUS).

A video presentation on the IODE Ocean Data Portal (presented during IMDIS 2010) is available on http://www.vimeo.com/10559861

The IODE Ocean Data Portal (ODP) development has two stages: Version 1 (V1) and Version 2 (V2). The ODP V1 has the initial capabilities and based on the technical specifications and software of End-to-End Data Management (E2EDM) technology developed by JCOMM/IODE ETDMP and Russian NODC (RIHMI-WDC, Obninsk). ODP (V2) will have full capabilities with use of the international interoperability standards and tools.

5.1.1 ODP V.1 FUNCTIONALITY

The ODP technology provides a certain level of data interoperability providing an access to local data systems with a wide variety of structures, formats, systems of coding of data and metadata, systems of data storage.

The ODP standards development is based on a paradigm that standards and technical solutions of the ODP interoperability infrastructure will be evaluated and accepted according to the IODE/JCOMM Standards Process.

The Ocean Data Portal includes the components of two broad categories:

1. Data components based on existing national, regional, global data systems. The participating NODCs and other data centres will build distributed data marine infrastructure providing data and metadata to the Portal;

2. Data integration and dissemination components – data/services registration, data discovery, delivery and visualization, content management and administration standards and tools

The ODP domain covers oceanography and marine meteorology (main fields).

The ODP v1 provides following applied functionality:

- IODE and other participating data centres generating discovery metadata about their datasets for distributed data search and retrieval;
- Metadata catalogue is centralized and available via web services;
- The Portal periodically harvesting these metadata, monitoring the accessibility of remote data sources and updating the portal metadata catalogue;
- Users can access the Portal and search for single or multiple data types from a distributed set of sources;
- Data request sourced from the appropriate data centre and returned to the Portal;

- Portal tools fuse the aggregated data and services in real time to produce a new product or service of value to the user.

ODP tools takes into account that data can be presented as:

- structured alphanumeric data sets (most of the ODP data);
- unrecognized structured or unstructured data.

The data can be classified into observation data, climate, analysis and forecast data. This classification is closely connected with the time period of updating of corresponding data sets (*e.g., forecast data are updated daily, and climatic data - much less often.*).

The IODE Ocean Data Portal does not require data centres to re-format their data, as it has tools to understand local data structures (DBMS tables, formats of data files) and translate the required data into the common transport data format or provide web-services to interact with local data systems.

The ODP provides description, query and transfer to users the required peaces of data sets on the basis of feature types and instances resulted from parameter (object) type, spatial/temporal extent and other agreed criteria.

The IODE data sets are dynamic and are updated yearly, monthly or even hourly depending on the specificities of the centre activity. In view of this, the ODP has mechanisms and tools to monitor the status and readiness of data sources, update metadata, populate it and update the metadata catalogue.

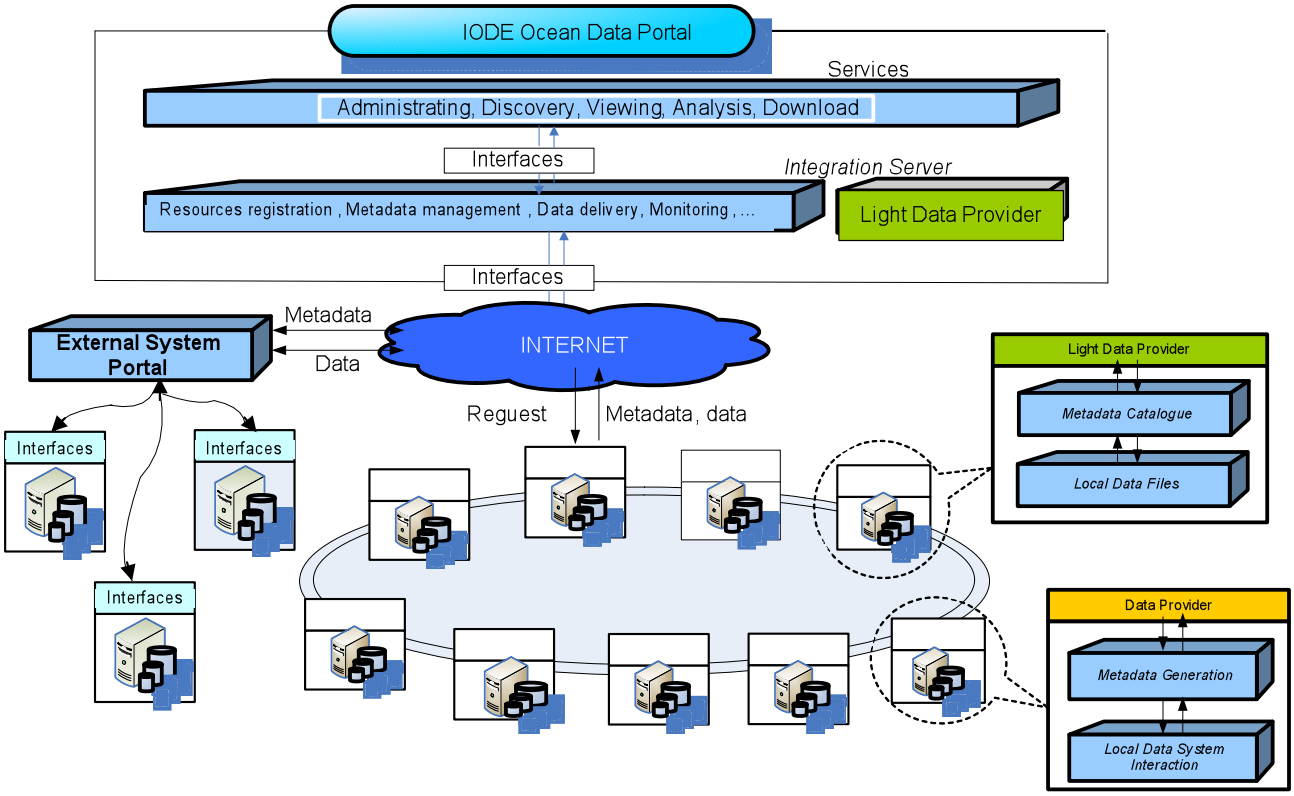

Figure 2: ODP (v.1.) architecture

5.1.2. CURRENT ODP STATUS

The ODP (v.1.) operation was started at 2009 and this version of ODP includes the components:

5.1.2.1. Data Provider

The Data Provider processes the local data sets and automatically generates the discovery metadata and transport NetCDF data files on requests or time-scheduling manner. These services are based on the OPeNDAP data (point, profile and grid) structures and specific metadata model based on ISO 19115. When the Data Provider is installed in the local data system and local data sets are registered, the latter becomes a data source for the ODP distributed data system.

The Data Provider covers following storage types:

- SQL-oriented databases (ranging from MS Access to Oracle);
- CSV-like structured data files (CSV, TSV and derivatives);
- Any unstructured data files (or unrecognizable by ODP services) – multimedia, documents, archives, etc.

The Data Provider has possibility to support a various types of the data granularity, i.e. makes it possible to create discovery metadata, search and deliver full datasets or specified data pieces (logical data units) of datasets - single cruise or data profile, single buoy or single coastal station data - and etc. The data granularity level is adjusted in the process of the local dataset registration.

The recent addition to the Data Provider software is the Light Data Provider which offers remote registration of local datasets using ASCII data files catalogue or XML CDI, WIS and MCP metadata records and allows deployment of the ODP system without the need to install software by the participating data centre.

5.1.2.2. Integration Server

Integration Server provides: registration and operation status monitoring of the distributed data sources, harvesting of the discovery metadata in coordination with Data Provider, management of the common codes/dictionaries and access to distributed data sources by user applications

- registration and operation status monitoring of the distributed data sources;
- harvesting of the discovery metadata in coordination with Data Providers;
- management of the common codes/dictionaries;
- access to distributed data sources by ODP services and user applications;
- “subscription” type services for data delivery via “pull” (saving data files on Integration Server user accessed public directory) and/or “push” on FTP;
- security and authorization policy.

The new version of the Integration Server (v.1.2) provides the following new functionality: logging the requests on data, monitoring of thematic federations, request patterns creation on requests (scheduled data delivery), data delivery (“push”) on FTP and BODC parameter dictionary support.

Recently the Integration Server was improved by a number of web-services which provides existing request-response communication both with fault-tolerant processing and error catch,

recognition and logging. Communication process across the ODP distributed data system consists of two processes:

Metadata harvesting by the Integration Server from the Data Providers. These data descriptions are exposed to a harvester, which is part of the Integration Server. This software regularly (at any set frequency) checks all data centres for new data descriptions and download these as necessary. These descriptions are added to a central repository that covers all data centres connected to the distributed system.

Request on data. Requests are transmitted by HTTP in encoded form. HTTP-connection between the Integration Server and Data Provider are active during processing and the Data Provider requests acceptance, validation, execution and response return. Communication based on web-services provides transactional and fault-tolerant mode. If errors occur the Integration Server will immediately receive a message with an error code and description and all errors will be published by the specific web-service by means of *postError* method. If a request for data was executed successfully the Data Provider will invoke *postResult* method with a response-message in the transport protocol structure.

5.1.2.3. ODP web site and Portal services

The ODP Services have responsibility for administration, discovery, viewing, analysis and download. The Ocean Data Portal includes a GIS-based user interface, metadata and data search, data download and visualisation components. The ODP services include a number of W3C and OGC web-services.

Discovery service disseminates a data source catalogue with descriptions of resources in the form of XML files. The metadata record is based on ISO 19115. The ODP service provides user interfaces for data and product search supported by the catalogue. The data source catalogue can be accessed from external systems directly or alternatively, by reformatting into other metadata structures.

Viewing service is based on web-based applications accessible via the web browser. The services provided include:

- data search that defines the sampling criteria using a spatial region, time period, phenomena, platform, etc.
- access to remote data sources via the Integration Server including request status monitoring; and
- processing of transport data files and tabular-graphic and map visualization of data using standard forms.

Analysis service has been developed to provide near real-time GIS-layer generation from distributed datasets both with interactive and fast presentation of multidisciplinary data and products on a map. It also includes Web Map Services (WMS) as a viewing service for data representation on a map. The user can adjust the composition of the map layers, the number of maps for viewing and other specifications. The mapping service enables a joint analysis of data to provide a view of the spatial variability of marine processes. ODP renders maps generated by the analysis service using Open Layers and MapServer.

Download service allows the user to download selected data to the local computer after viewing. If time scheduling is required to download data, the user can register the site for downloading, the list of required datasets and the sampling criteria. The transport data file formats that are available are:

- NetCDF - E2E structure;
- ASCII.

Selected data can be either downloaded in a single zip-file or viewed using the ODP result viewing service.

5.1.2.4. ODP training courses

Three training courses were provided for ODP distributed data system establishment.

- Training for the ODINBlackSea countries was held on 20-21 March 2009, Obninsk, Russian Federation. Five NODCs/DNAs from Bulgaria, Romania, Russia and Ukraine participated;
- First IOC/WESTPAC Training Course on the Establishment of National IODE ODP Nodes was held from 31 August – 4 September 2009 in Seoul, Republic of Korea. There were 10 participants from Republic of Korea, Japan, Malaysia, Thailand, Indonesia and Vietnam;
- Training Course for Georgian and Turkish NODCs was held on 21-23 December 2009 in Istanbul, Turkey. Trained took place in Black Sea Commission Office. Six trainees from Georgia and Turkey were involved.

5.1.2.4. ODP data sets

The most serious problem of ODP practical use is small number of data providers. It is expected the expanding ODP data providers from IODE network and under ODP-WIGOS Pilot Project.

Below the list of datasets that will be contributed to the ODP by partner organizations and programmes as part of the WIGOS Pilot Project for JCOMM is presented:

- US NODC: World Ocean Atlas; World Ocean Database; GTSPP; surface currents from HF radar;
- Russian Federation NODC: data extracted from ESIMO – real-time GTS data and product (air temperature, wind, wave, sea level, current, water temperature, salinity, oxygen);
- Canada ISDM: upper-ocean T & S gridded in situ fields; and ocean currents derived from surface drifters;
- UK BODC: sea level data from PSMSL;
- UK Met Office or DWD via Virtual GISC: Marine Climatological Summaries and Global Collecting Centres (GCCs);
- Blended-quality climatology products (e.g., ICOADS); and Global High-Resolution Sea Surface Temperature Pilot Project (GHRSST-PP).

Other potential partners include:

- Profiling floats (Argo);
- Deep ocean time-series reference stations (OceanSITES);
- Tropical moorings (TAO);
- Drifters (DBCP);
- Ship-based observations in the SOT (ASAP, VOS, XBTs);
- Tide gauges (GLOSS);
- Water temperature and salinity profiles (GTSPP);

- Surface underway data (GOSUD); and
- Ocean carbon (IOCCP), etc.

It is required to update the IODE network procedures taking account the ODP as new tool to provide the integration and shared access to data sets of IODE NODCs and WDCs.

5.1.2.5. ODP interaction with Sea Data Net

ODP should be interoperable with other information systems. Following the IODE-XX recommendations high priority has been assigned to the interaction with the SeaDataNet infrastructure (SDN). The ETDMP and SDN management group estimated the compliance issues of the ODP and SDN, and, also, proposed specifications of the ODP-SDN interoperable interfaces based on portal to portal interaction. These proposals were summarized in document "Technical Specifications of the IODE Ocean Data Portal and Sea Data Net interoperability".

The interoperability arrangements will be based on the interoperability to the portals: achieving a communication between the SDN CDI V1 portal and the ODP portal. Basic approach is following:

- arrange that the ODP/SDN portals have an up-to-date overview of the datasets, that are managed and available for delivery by the ODP/SDN infrastructures and its data providers;

- arrange that ODP/SDN users can request and if ok, get access to these ODP/SDN datasets, in an efficient way.

5.1.2.6. ODP interoperability with the WIS

The 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 WIS. This component has been installed on the RNODC/RIHMI-WDC (Obninsk) platform.

The WIGOS Implementation Plan defines that ODP will play a wider role under WIS providing the integration of the JCOMM/IODE data sources, data and product exchange with the WIS.

Now it is possible to realize the fixed interoperability requirements for achieving a communication between the ODP and dedicated GISC. From technical point of view it's required to provide the metadata conversion from native metadata structures into the original ISO 19115 and adopt the common rules of data exchange for the data granularity. The future practical steps for ODP-WIS interactions should take account the solutions on WIS components interactions adopted by WMO Inter-programme expert team for WIS (Republic of Korea, February, 2009).

5.1.3. FUTURE ACTIONS

The Meeting stressed the need to identify and install more data providers.

In this regard it was noted that JODC (Japan) had just set up the data provider software and was expected to start serving data shortly.

➔ **The Meeting requested** the ODP technical team to translate the ODP 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.

➔ **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. (see 5.2).

➔ **The Meeting agreed** on a detailed work plan described under Agenda Item 6.3. and Annex II.

5.2. ODP (V.2) OVERALL ARCHITECTURE

5.2.1. BASIC SOLUTIONS

This Agenda Item was introduced by Dr Sergey Belov referring to Document JCOMM-IODE ETDMP-II/Doc.5.2 (IODE OCEAN DATA PORTAL V.2).

The design paper "Initial IODE Ocean Data Portal Architecture" was developed with the proposals on the vision and overall architecture of the ODP (version 2), as well as on the operational aspects of the ODP full capabilities development. The documents were reviewed by the JCOMM DCMG-III meeting (March 2008, Oostende, Belgium) and ODP-WIGOS Pilot Project meeting (September 2008, Geneva, Switzerland).

ODP v.2 is aimed to withdraw from standalone web-based services, to implement and standardize methods and means of interface interaction. It will allow to unify access to services that belong to the ODP organizations and systems (SDN, WIS) and base on different standards (OGC, W3C).

The technical solutions for the ODP v.2 were considered during the Consultation Meeting on cooperation between the ODP and the Integrated Marine Observing System (IMOS) (February 2010, Hobart, Australia).

Technical requirements

- Provide the means (metadata, services and etc.) for a distributed marine data infrastructure enabling the interactions among data providers, service providers and with end-users,
- Permit data interaction whilst avoiding data reformatting and de-localization (i.e. data remain on the provider infrastructure without change);
- Allow adjustment (orchestration) of services invoking for online request/response processes and other operations;
- Allow chaining of services into more complex ones;
- Support "subscription" type services and standing orders (e.g. oil spill monitoring and alerting);
- Allow easy identification of, and access to requested services and data, with progress follow-up until completion;
- Integrate data/services from multiple domains to exploit multi-domain synergies;

- Allow the services/data providers to register, provide and promote their products to thematic or regional portals;

- Minimize data/service provider investments by building on open standards

Key features

- Catalogue synchronization
- Metadata uploading
- Data discovery and download – "pull"
- Subscription ("push")
- Data centralization ("cache")
- Performance

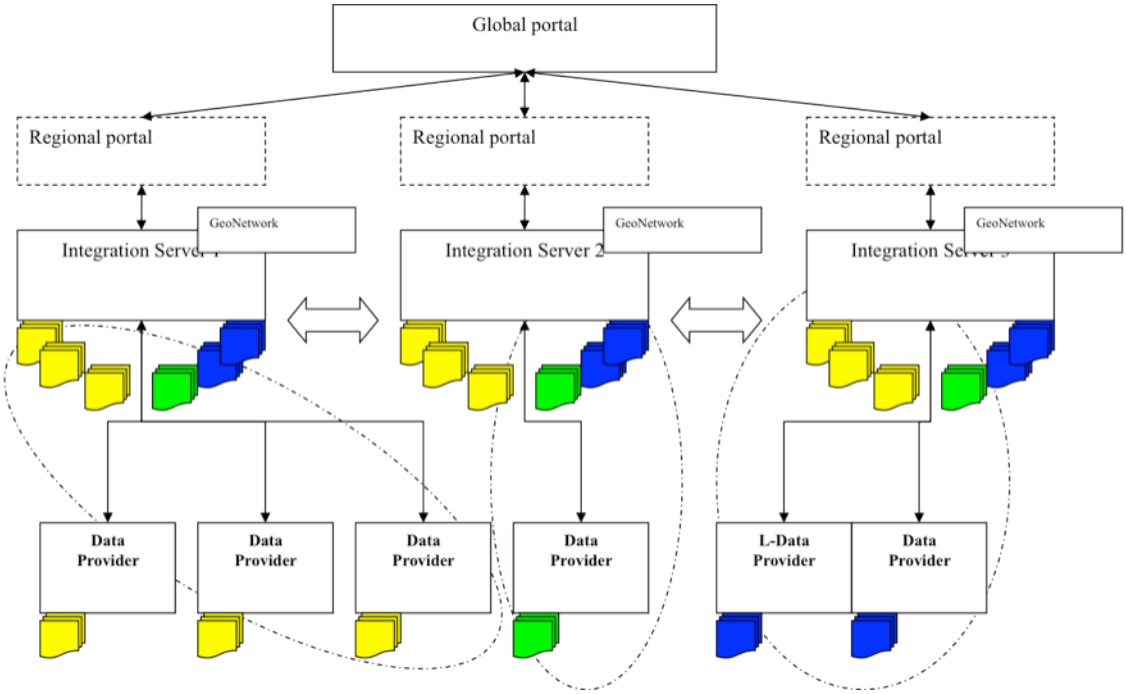

Figure 3: key features

Detailed descriptions of the key features:

Catalogue synchronization

- Each node has one or several data sources;
- The metadata catalogue is synchronized by means of the Integration Server services and published via GeoNetwork;
- Integration Servers provides synchronization among other Integration Servers in the system

Metadata uploading

- Data Provider contains services for data set registration, connection with the data itself and metadata catalogue update by creating ISO 19115 metadata records in the local catalogue;
- DP can collect metadata from it's bodies and update its own metadata catalogue;
- Integration Server is harvesting metadata in the specified time frame;
- Integration Server provides archiving routines for collected metadata;

Data discovery and download – "pull"

- Information is discovered manually by browsing the metadata catalogue from the ODP web portal. It offers a category-based view, a key words, geo-area, parameters search query;
- User is notified whenever the data is available;
- Web-service notification and email notification are used

Subscription "push"

- Integration Server supports the subscription mechanism and a user can define one or several data sets, using appropriate metadata, specifying delivery point and time. Every time a new data is available it will be pushed up to the specified location (FTP, HTTP);
- Data can be reformatted before the delivery;
- User is notified by means of email;
- User is notified whenever the data is available;
- Subscription can be managed through the ODP portal.

Data centralization ("cache")

- Integration Server can hold the data cache for required operational data sets;
- Storage time – minimum 24 hours;
- Data "cache" is stored as NetCDF in THREDDS catalog;

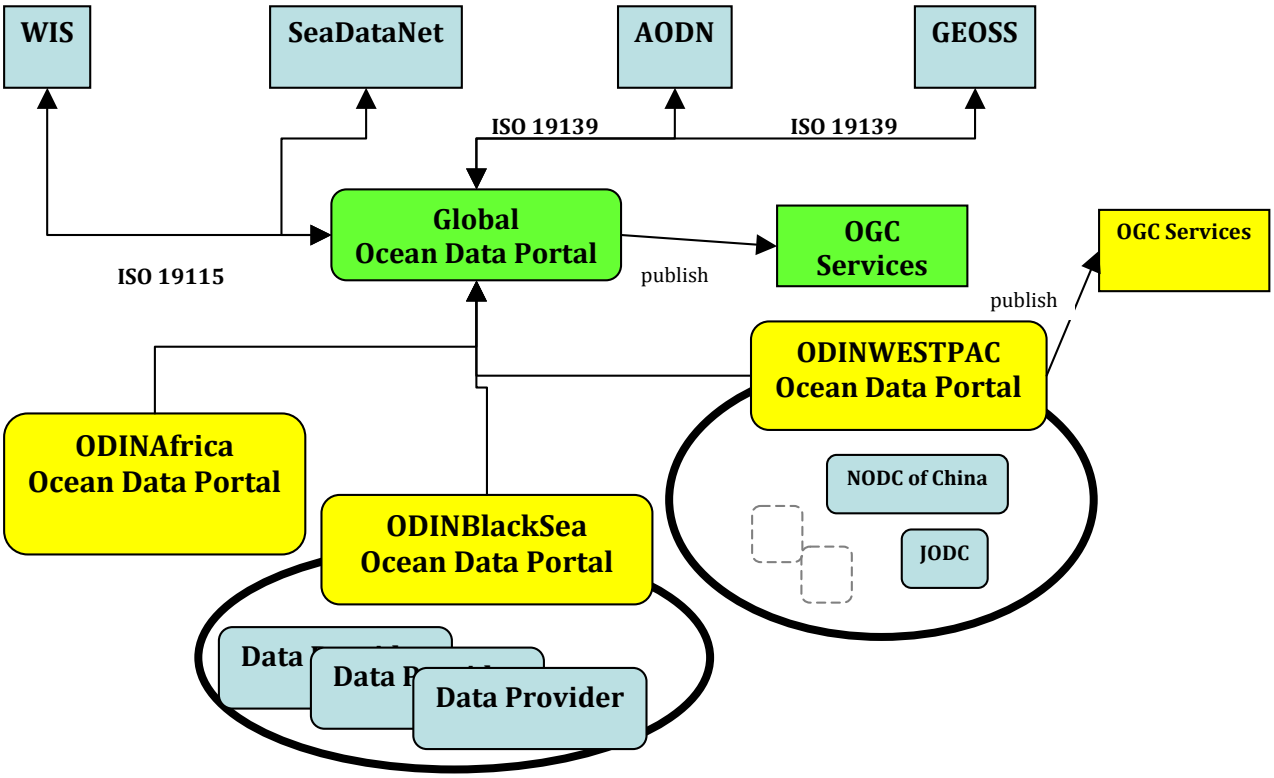

Figure 4: Upgraded ODP interactions

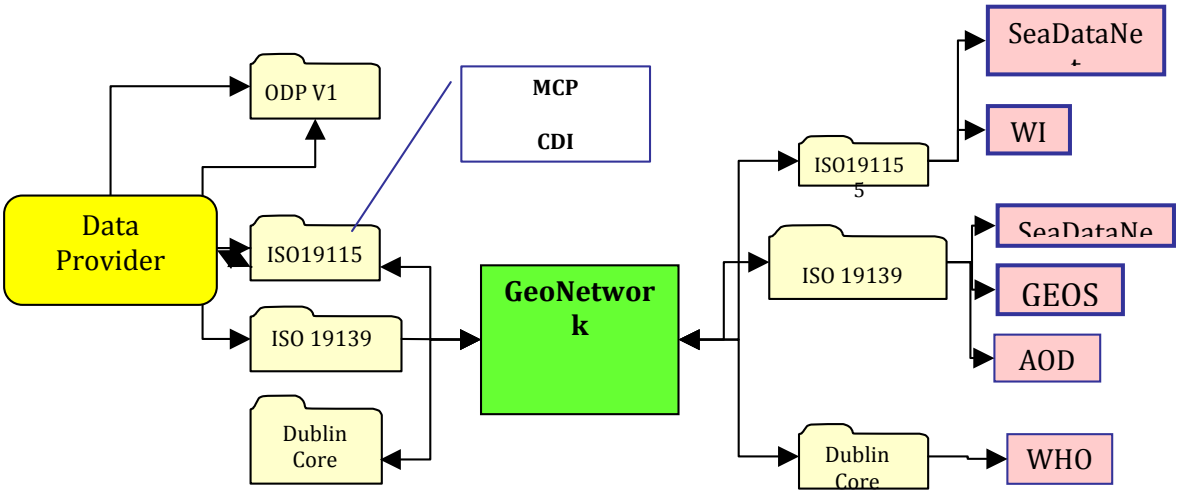

Figure 5: ODP V2 metadata interface

The Meeting then discussed the timeline towards the launching of ODP v.2. It was noted that most of the required technology already exists. The developments related to compliance with ISO-19115 will take 1-2 months. The code list mapping however will take 6 months to 1 year to complete.

➔ **The Meeting decided** that ODP v.2. will need to be ready for demonstration by JCOMM-IV (mid 2012).

5.2.2 FUTURE ACTIONS

➔ **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 August 2010. The Paper will then be reviewed taking into consideration the received feedback, during the SG-ODP (planned for September 2010).

➔ **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.

➔ **The Meeting agreed** on a detailed work plan described under Agenda Item 6.3. and Annex II.

6. WORK PLAN FOR 2010-2011

Note: a consolidated version of the Work Plans is attached in **Annex II**.

6.1. ETDMP TASK TEAM FOR ODS

The work plan was prepared by Mr. Y. Michida and Mr. P.N. Oloo. They proposed the following priorities:

1. Standards for temporal/space/units attributes of data and metadata:

- date and time (based on ISO 8601);
- latitude and longitude (based on ISO 6709);
- units (based on SI).

The above-mentioned standards should be used as elements of more complicated standards grouping as below.

2. Standards for thematic code list:

- platform type;
- geoarea (IHB);
- instrument type.

3. Standards for vocabularies:

- parameters;
- institutions (SeaDataNet, GCMD and other);
- platforms (respectively platform types – see above);
- instruments.

4. QC flag standard:

The best case to have single standard for main ocean/meteo parameters (temperature, salinity, wave, wind, sea level, currents), . As minimum there is not recommendation to use a number of standards for the same parameters, for example GTSPP, Argo, GODAR and etc.

5. Discovery metadata (ISO 19115/19139 compliant):

There are a number of candidates: MCP, CDI, WMO Core metadata profile, pure ISO. It was noted the needs to study the ISO extensions respectively data elements content, data granularity, data processing level, transport data file types and other as It was done in ODP internal metadata record structure.

The CDI was submitted as proposal for ODS process. In this connection it was noted:

- needs to consider all above mentioned candidates jointly as was proposed above;
- candidates for discovery metadata standards are used expanded (respectively ISO 19115 code lists) and vocabularies (for example, CDI uses more 10 common vocabularies). It requires to consider such type of candidates in sequence – code list and vocabularies should have first priorities and metadata structure – after that.

This results in the following detailed work plan:

Action	Task	Deadline	Who	Budget	Comments
1	Review the process taken to adopt the Standard for country codes. Prepare procedures for ODS for best practices. Prepare the candidates of standard for 'Date and Time', seek appropriate persons and/or organizations that make proposals.	*May 2010* *July 2010* *August 2010*	*Y. Michida, P.A. Oloo*	None	The ODP TT will provide the standards requirements to ODS TT at May 2010
2	Encourage SeaDataNet and GE-BICH to submit their proposals on ODS, by keeping in touch with relevant bodies. Regarding QC flags, in particular, with SeaDataNet, GE-BICH, GTSPP, and MyOcean..	*October 2010*	*Y. Michida*	None	The ODP TT requirements will be taken account.
3	Examine further the candidates of standards for 'Lat, Lon, Alt.' and other items in Cat.1 (see classification above), and seek appropriate persons and/or organizations that make proposals.	*October 2010*	*P. A. Oloo*	None	See above
4	Propose a working plan to set standards for the items in Cat.2 to 5.	*November 2010*	*Y. Michida & P.A. Oloo*	None	See above
5	Keep communicated with ODP and Metadata TT respectively standards process	continuously	*Y. Michida*	None	None
6	Report on the ODS development to the ETDMP-III or IODE-21.	*Next session of ETDMP*	*Y. Michida*	Cost of travels	Cost of travels
7	Coordinate the ODS processes for submitted proposals.	continuously	*Y. Michida & P A Oloo*		

The Meeting adopted the work plan.

During the Meeting a standard proposal was received from SeaDataNet entitled "*Proposal to adopt the SeaDataNet Common Data Index metadata profile (CDI) as a Standard for Oceanographic Data Exchange - Version 1.0 - April 2010*".

The Meeting reviewed the Proposal in accordance with Step 2 of the Process (ETDMP conduct review of fitness of the proposal and responds within 15 days". (seeAgenda Item 3.1

as well as
http://www.oceandatastandards.org/index.php?option=com_content&task=view&id=37&Itemid=45 .

➔ **The Meeting concluded** that the Proposal is complete and fully informative of what is being proposed, and **requested** the IODE Secretariat to inform the proponents that their proposal will be moved to the "submitted" status**. The Meeting requested** the Chair ETDMP to provide detailed comments on the Proposal based upon discussions at the Meeting to enable further corrections as deemed necessary.

6.2. ETDMP TASK TEAM FOR METADATA

The work plan was prepared by Mr Don Collins while noting that Ms Nicola Scott and Ms Jixian Chen were absent during the Meeting. Immediately after the Meeting Ms Scott and Ms Chen were contacted by email to seek their agreement of the work plan. The below work plan is therefore agreed upon by all members of the ETDMP Task Team for Metadata.

Action	Task	Deadline	Whom?	Budget $	Comments
1	Review relevant ISO19115 standards and guidelines. Provide overview report to ET regarding relevant standards.	July 2010	N.Scott, D.Collins, J.Chen, additional volunteers?		Start with JCOMM/IODE (Reed), 2008, 'Comparison between CDI, MCP and WMO core profiles' and ETDMP, 2006, Crosswalk between ISO and multiple metadata standards.
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.Colliins	$600	Consider contacting participants from JCOMM/IODE Standards discussion for additional review capacity.
1,15	Check for cost of purchasing/licensing the entire IS019X series of standards publications.	May 2010	D.Colliins	?	
1,2	Devise criteria for documenting the review/comparison.	June 2010	N.Scott, D.Collins, J.Chen		
1,3	Coordinate/compile comments from reviewers.	September 2010	N.Scott, D.Collins, J.Chen		
2	Review SeaDataNet metadata management structure & techniques. Provide an overview report to ET identifying advantages & disadvantages of SeaDataNet approach.	August 2010	D.Scott, D.Collins, J.Chen, additional volunteers?		Consider contacting participants from JCOMM/IODE Standards discussion for additional review capacity.
2,1	Gather relevant SeaDataNet metadata management documentation.		N.Scott, D.Collins, J.Chen		
2,2	Devise criteria for documenting the review/comparison.		N.Scott, D.Collins, J. Chen		
2,3	Coordinate/compile comments from reviewers.		N.Scott, D.Collins, J.Chen		
3	Identify various semantic metadata management systems used by scientific community.	September 2010	N.Scott, D.Collins, J.Chen, additional volunteers?		Consider contacting participants from JCOMM/IODE Standards discussion for additional review capacity.
3,1	Define criteria for selecting and comparing semantic metadata	October 2010	N.Scott, D.Collins,		Clarify what are considered 'semantic metadata

	management systems.		J.Chen		management systems'.
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.	Febrary, 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?		Consider contacting participants from JCOMM/IODE Standards discussion for additional review capacity.
4,1	Propose model interoperability standard to wider community with the aim of adoption through Ocean Data Standards (ODS) process.	June 2011	J.Scott, D.Collins, J.Chen		
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		
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		
			Total budget	600 **$**	

➔ **The Meeting adopted** the work plan and requested that the sum of US$ 600 be allocated within the IODE or IOC Project Office for IODE budget (2010).

6.3. ETDMP TASK TEAM FOR ODP

Action	Task	Deadline	Who	Budget (US$)	Comments
1	Main requirements of the ODP V2 for ODS	May 2010	Sergey BELOV, Mathieu OUELLET, Anyuan XIONG		Document will contain list of required code lists and standards to be discussed and proposed by ODS
2.1	Ocean Data Portal V2 technical specification whitepaper (draft)	June 2010	Sergey BELOV		
2.2	Technical specifications on ODP V1 – SeaDataNet interoperability	June 2010	Sergey BELOV, Dick Sharp		Document will cover technical aspects and description of the implementation stages for interoperability process
2.3	Technical specifications on ODP V1 – WIS interoperability	June 2010	Sergey BELOV, Nikolay MIKHAYLOV		Document will cover technical aspects and description of the implementation stages for

					interoperability process
2.4	Ocean Data Portal V2 technical specification whitepaper (final)	September 2010	Sergey BELOV, Nikolay MIKHAYLOV, Mathieu OUELLET, Anyuan XIONG		Final version will be populated within ETDMP-II as well as to the other IODE expert groups, SDN committee and WIS.
3	**ODP V2 metadata**				
3.1	Document on migration of the ODP metadata into the ISO 19115 standard	June 2010	Sergey BELOV, Mathieu OUELLET, Anyuan XIONG		Document will cover crosswalk rules between existing ODP metadata structures and the ISO TC211/19115 metadata standard
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**	**Octoberr 2010**	**Sergey BELOV**	**5K USD**	Use the NetCDF CF and functionality to generate the space data or WMS “in fly”, user interface improving taking account IMOS expirience.
5	**ODP V1/V2 toolbox**		**ODP development team (lead by S.BELOV)**	**15K USD**	
5.1	ODP V1 - V2 metadata conversion service	Feb 2011	ODP development team (lead by S.BELOV)		Specific service to provide metadata conversion for operational current versions of the ODP Data Provider software to meet the needs of the V2 metadata
5.2	ODP V2 Integration Server	May 2011	ODP development team (lead by S.BELOV)		
5.3	ODP V2 Data Provider	May 2011	ODP development team (lead by		

			S.BELOV)		
5.4	ODP V2 Portal toolkit (alpha)	September 2011	ODP development team (lead by S.BELOV)		Will contains ODP Data Provider V2, ODP Integration Server V2, ODP Portal V2 components
6.	**Interoperability components**				
6.1	Joint ODP – SDN communication service	End of 2010	ODP development team (lead by S.BELOV)		
6.2	ODP – WIS communication service	End of 2010	ODP development team (lead by S.BELOV)	Non budget (1 joint meeting with WIS)	
6.3	ODP – OBIS communication service*	September 2011	ODP development team (lead by S.BELOV)	Non budget (1 joint meeting with OBIS)	
7.	**Data provider expansion**				
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		Topic should address new personal involvement into the expansion process. Mathieu OUELLET – responsibility for the North American region Anyuan XIONG – WESTPACK region IMOS – Australia (person should be nominated) US-NODC – Charles SUN

➔ **The Meeting adopted** the Work plan.

➔ **The Meeting requested** Mr Ouellec to identify potential data providers for WIGOS and manage this work from ODP-TT side.

7. DATE AND PLACE OF NEXT SESSION

It was proposed to have the 3rd Session of the ETDMP on 11-12 October 2011 at the IOC Project Office for IODE in Oostende, Belgium.

8. CLOSURE

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

The Chair closed the meeting on 7 April 2010 at 15h45.

ANNEX I

AGENDA

1. ORGANIZATION OF THE SESSION
2. ETDMP WORK ORGANIZATION
   - 2.1 ETDMP REPORT FOR 2008-2009
   - 2.2 ETDMP BASIC TASKS FOR 2010-2011 AND WORK ORGANIZATION
   - 2.3 PROPOSED ETDMP WORK STRUCTURE AND ORGANIZATION
3. OCEAN DATA STANDARDS
   - 3.1 OCEAN DATA STANDARDS PROCESS
   - 3.2 ODS CANDIDATES AND PRIORITIES, ETDMP CONTRIBUTION
     - 3.2.1 Progress made regarding recommended standards
     - 3.2.2 Standards to be identified
     - 3.2.3 Future actions
4. METADATA MANAGEMENT
   - 4.1 INSTRUMENT/PLATFORM METADATA
     - 4.1.1 Status of ODASMS
     - 4.1.2 Proposed Work Plan
   - 4.2 DATA SET METADATA
   - 4.3 OTHER METADATA NEEDS (ORGANIZATIONS, OBSERVING SYSTEMS, ETC.) AND INTEROPERABILITY ISSUES OF METADATA MANAGEMENT
     - 4.3.1 Issues
     - 4.3.2 Requirements
     - 4.3.3 Proposed Work Plan
5. OCEAN DATA PORTAL
   - 5.1 ODP (V.1) CURRENT STATUS, THE ISSUES OF DATA PROVIDER AND INTERACTION WITH OTHER SYSTEMS
     - 5.1.1 ODP v.1 functionality
     - 5.1.2 Current ODP status
     - 5.1.3 Work plan
   - 5.2 ODP (V.2) OVERALL ARCHITECTURE
     - 5.2.1 Work Plan
6. WORK PLAN FOR 2010-2011
   - 6.1 ETDMP TASK TEAM FOR ODS
   - 6.2 ETDMP TASK TEAM FOR METADATA
   - 6.3 ETDMP TASK TEAM FOR ODP
7. DATE AND PLACE OF NEXT SESSION
8. CLOSURE

ANNEX II

2010-2011 WORK PLAN

Agenda item	Task	Deadline	Who	Budget
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
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
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
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
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
5.1.3	**The Meeting requested** the ODP technical team to translate the ODP 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.	November 2010	ODP technical team	n/a
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
5.2	**The Meeting decided** that ODP v.2. will need to be ready for demonstration by JCOMM-IV (mid	Mid 2012	ODP technical team	n/a

	2012).			
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 August 2010. The Paper will then be reviewed taking into consideration the received feedback, during the SG-ODP (planned for September 2010).	July 2010	ETDMP TT for ODP	n/a
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
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 Ouellec to identify potential data providers for WIGOS (see ETDMP TT fore ODP work plan)			

ANNEX III

LIST OF PARTICIPANTS

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ANNEX IV

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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