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WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC
COMMISSION (OF UNESCO)

DATA MANAGEMENT COORDINATION GROUP FIFTH SESSION

Geneva, Switzerland
29-31 January 2014

FINAL REPORT

2013

JCOMM Meeting Report No. 112

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NOTES

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Chair, Publications Board
World Meteorological Organization (WMO)
7 bis, avenue de la Paix
P.O. Box No. 2300
CH-1211 Geneva 2, Switzerland

Tel.: +(41 22) 730 84 03
Fax: +(41 22) 730 80 40
E-mail: Publications@wmo.int

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EXECUTIVE SUMMARY

The Fifth Session of the JCOMM Data Management Coordination Group (DMCG) was held at the WMO Secretariat headquarters in Geneva from 29 to 31 January 2014.

The Group reviewed guidance from the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), and the priority activities for the period 2012 to 2017 for the Data Management Programme Area (DMPA) as endorsed during JCOMM-4 (Yeosu, Republic of Korea, May 2012). It also reviewed further guidance from the Management Committee, and updated the DMPA work plan for the intersessional period accordingly. In particular, the Group concurred with the proposal from the Management Committee to establish, through a new Cross-cutting Task Team on Integrated Marine Meteorological and Oceanographic Data and Services in the framework of the WMO Integrated Global Observing system (WIGOS) and the WMO Information System (WIS) (TT-IOSWW), a mechanism within JCOMM to overview and discuss the necessary requirements for building the architecture and the interfaces between the WIS and Oceanographic services, and particularly ensure the flow of oceanographic data and products to multiple uses and users through WIS, including in particular for wave and ocean forecasting services products.

The Group reviewed the recent activities of the JCOMM Expert Team on Marine Climatology (ETMC), and endorsed its work programme as defined at the fourth ETMC Session. The Group noted some progress with regard to the development of the Marine Climate Data System (MCDS), in particular with regard to the definition of evaluation process and criteria for MCDS candidate centres. Efforts remain to be made regarding the development of wave and sea-ice climatologies in liaison with the Services and Forecasting Systems Programme Area (SFSPA) and its expert teams. The Group also noted ongoing efforts to enhance the links with the WMO Commission for Climatology (CCI).

The Group also reviewed the recent activities of the JCOMM-IODE Expert Team on Data Management Practices (ETDMP), noting that its activities are focusing on conducting the IODE/JCOMM Standards Process (ODS); improving the metadata management; and developing the IODE Ocean Data Portal (ODP), including its interoperability with the WMO Information System, the Pan-European infrastructure for Ocean and Marine Data Management (SeaDataNet) and other projects. The Group endorsed the ETDMP work programmes as defined at the third ETDMP Session.

The Group reviewed the requirements for quality management as promoted by WMO and the IODE through their respective Quality Management Frameworks. DMCG will be coordinating the DMPA review an input by DMPA Teams and experts of the draft framework for Marine Weather Forecaster Competence before its submission to JCOMM ad hoc Task Team on Marine Competency Requirements (TT-MCR) for further submission to the WMO sixteenth Congress in 2015. Efforts will also have to be made by the DMPA for providing appropriate input to WIGOS Regulatory Materials through the WIGOS Task Team on Regulatory Materials (TT-WRM).

As part of the activities of the now completed ODS project, the Group noted that Recommendation for a Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data has been published as part of Volume 3 of IOC Manuals and Guides No. 54. The Group noted establishment by IODE-22 of an Ocean Data Standards and Best Practices Project, and agreed that JCOMM DMPA should contribute to that project.

The Group noted the perspectives of both the IODE and the WMO with regard to capacity development, and made a few recommendations towards future enhanced collaborations, e.g. to establish a joint IOC-WMO working group on JCOMM capacity building activities in the view to organize joint courses or workshops on (i) the Ocean Data Portal (ODP); (ii) ocean and marine meteorology data management, including cross-discipline introductory courses; (iii) Port Meteorological Officers (PMOs); (iv) marine instrumentation and deployment through WMO-IOC Regional Marine Instrument Centres (RMICs); (v) ocean observations and modeling; (vi) storm surge and wave forecasting; (vii) application of satellite products to marine forecasting; (viii) sea ice analysis; and (ix) maritime safety services and marine service quality management.

The Group reviewed the status of the WIS, and noted that nine WIS Data Collection and Production Centres (DCPCs) associated with JCOMM are registered. Of these, four are fully operational, one is ready for formal recognition through a change to the Manual on WIS, two are providing an operational service but need to complete the WIS registration process, and two are under development. The Group also discussed interoperability of the WIS with the ODP, noting that the latter now provides an interface for users to query the contents of the WIS metadata catalogue.

The Group reviewed the status of migration to Table Driven Codes, and noted that good progress has been made in this regard, including with regard to the validation of BUFR¹ templates for moored buoy data, drifting buoy data, and CTD² data, as well as regarding the masking of ship's identification with the ENCODE³ proposal. The validated templates should become operational on May 2014. The validation of the VOS template, including the ENCODE proposal has been delayed, but this extra functionality is not required for migration.

The Group discussed DMPA collaboration with the IOC-WMO-UNEP-ICSU Global Ocean Observing System (GOOS), and the Ocean Biogeographic Information System (OBIS), and noted that GOOS is in the process of developing a framework for biological and biogeochemical ocean observing systems. Data and information systems are a key component of the GOOS global framework for biological ocean observing systems and IODE/OBIS will contribute to this by playing a role in providing data infrastructure and guidelines and best practices in marine biodiversity data management. IODE/ODP is currently working with GOOS to serve metadata and data through the ODP. EuroGOOS has been providing coordination support with the GOOS Regional Alliances (GRAs) and has provided an inventory of candidate resources to be enabled through the ODP. Enabling access to these resources is currently underway with a significant number of datasets to be available by the end of January 2014.

The Group reviewed progress on the implementation details of the Data Management Plan (JCOMM TR No. 40, Rev. 1), as well as the future actions for the realization of the plan. The Group updated these two documents taking into account JCOMM-4 and IODE-22 guidance, and discussions during this DMCG Session. Tasks and future actions for the realization of the Plan and its objectives were also discussed in order to be able to propose a further updated version of the plan. The Group agreed that the next update of the Data Management Plan should be made publicly available within 10 months and requested S. Iona to lead this effort in liaison with, and with input from Group members.

The Group reviewed the latest version of the draft Oceanographer's Cookbook for submitting ocean data in real-time and delayed mode. The Cookbook is a practical resource to those who collect oceanographic and marine meteorological data to facilitate contribution of the data to the international community. The Group agreed that the documents should be maintained electronically with additions made as required.

The Group reviewed action items arising from the Session, and updated its work plan for the intersessional period 2014-2017. The updated workplan is reproduced in **Annex IV**.

1 FM-94 BUFR: Binary Universal Form for the Representation of Meteorological Data

2 Conductivity, Temperature, and Depth measurements

3 Ship masking scheme whereby a unique, non-repeating identifier is used; the identifier is derived from encrypting elements in the message, e.g. callsign + latitude + longitude

GENERAL SUMMARY OF THE WORK OF THE SESSION

1. ORGANIZATION OF THE SESSION

1.1 Opening

1.1.1 The Fifth Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) Data Management Coordination Group (DMCG) was opened by Ms Sissy Iona (Greece), Chairperson of the DMCG, at 08h30 a.m. on Wednesday 29 January 2014 at the World Meteorological Organization (WMO) Secretariat headquarters in Geneva, Switzerland. Ms Iona welcomed the participants at the meeting. She recalled that the initial membership of the Group decided by the Fourth Session of JCOMM (Yeosu, Republic of Korea, 28–31 May 2012) has been extended in order for the DMCG to be able to address all the JCOMM priority activities for this JCOMM intersessional period. She summarized the workplan for this DMCG Session. Ms Iona recalled that the activities of the DMPA provide opportunities to develop national activities in a way consistent with JCOMM requirements as well as JCOMM standards and best practices.

1.1.2 The Director of the Observing and Information Systems Department of the WMO Secretariat representative, Dr Wenjian Zhang welcomed the participants to the Session on behalf of the Secretary-General of WMO, Mr Michel Jarraud, and the Executive Secretary of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, Dr Wendy Watson Wright. The Group recognized the efforts of the WMO to implement the WMO Integrated Global Observing System (WIGOS) per WMO Sixteenth Congress guidance.

1.1.3 Dr Zhang recalled that met-ocean applications provide the means to prevent, mitigate, and adapt to the impacts of ocean phenomena, weather, and climate on the environment and human activities in coastal regions and beyond. While useful to realize socio-economical benefits, met-ocean applications rely heavily on *in situ* and satellite meteorological and oceanographic observation data and products. From that perspective, the role of the DMCG is important to provide guidance on the means to assure appropriate data exchange between data producers and data users.

1.1.4 Dr Zhang also recalled that the WMO Information System (WIS), the WMO Integrated Global Observing System (WIGOS), and the Global Framework for Climate Services (GFCS) that is now developing are increasing the demand for high quality, documented, and traceable ocean data, both historical, and operational (real-time). The DMCG is therefore expected to contribute to the implementation of the WIS, the WIGOS, and the GFCS by facilitating the sharing and exchange of the required ocean data and products, and developing the ocean data management standards, practices, and procedures in a way consistent with WIS, WIGOS, and GFCS requirements.

1.1.5 The Group noted some developments of high interest to WMO, including (i) the establishment of a Task Team on Integrated Marine Meteorological and Oceanographic Data and Services in the framework of WIGOS and WIS (TT-IOSWW); (ii) the development of the new Marine Climate Data System (MCDS), and access to high quality historical marine climate data; (iii) the continued development of the IODE Ocean Data Portal (ODP), and its interoperability with the WIS; (iv) the new Ocean Data Standards Best Practices (OSDBP) project promoted by the International Oceanographic Data and Information Exchange (IODE) Committee; (v) consistency with the requirements of the WMO and IODE Quality Management Frameworks; and (vi) enhancing the collaborations between the WMO and the IODE on Capacity Development.

1.1.6 Dr Zhang thanked all the Group members for their participation at the meeting, and their valuable contributions to the WMO and IOC activities through JCOMM. He assured them of the continued commitment of WMO to support the JCOMM Data Management Programme Area (DMPA) and its work, and wished the participants for a very successful meeting and an enjoyable stay in Geneva.

1.2 Adoption of the agenda

1.2.1 The Chairperson introduced the Provisional Agenda, and invited the meeting to review it and adopt it. The meeting adopted the Agenda (**Annex I**).

1.3 Local arrangements

1.3.1 The Secretariat representative provided information on the working hours of the meeting and some practical arrangements for the meeting.

1.3.2 Participants were reminded that all working documents were made available through the JCOMM web site. Participants were invited to introduce themselves briefly. The list of participants is available as **Annex II**.

2. DMPA CHAIRPERSON'S REPORT

2.1. The DMCG Chairperson, Ms Sissy Iona (Greece) presented a report on the main activities of the Group during the last intersessional period. She recalled that she has been elected by the Fourth Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM-4, Yeosu, Republic of Korea, 23 - 31 May 2012) as Data Management Programme Area (DMPA) Coordinator, and DMCG Chair for the coming intersessional period until 2017. JCOMM-4 also decided on the composition of the new DMCG with some positions to be filled after the JCOMM-4 Session. The membership was then completed in consultation with the IODE, DMPA Coordinator, the Management Committee, and the Secretariat according to JCOMM-4 guidance.

2.2. Ms Iona reported on the outcome of the tenth Session of the JCOMM Management Committee (Paris, France, 7-10 May 2013) for activities linked to the DMPA. The Management Committee guidance is discussed under agenda item 3 (see DMCG-5 document no. 3).

2.3. Ms Iona also reported on the results of the review of the MCDS implementation Plan. She recalled the group that after the Twenty-Second session of the IODE Committee (IODE-22, Ensenada, Mexico, 1-15 March 2013), an *ad hoc* task team was established in order to review the plan and provide comments in order to contribute to its planning and implementation. She further reported on the development of the new Marine Climate Data System (MCDS) and the evaluation of China's application to become a WMO-IOC Centre for Marine Meteorological and Oceanographic Climate Data (CMOC). An evaluation group for reviewing CMOC applications has been established per guidance from the Expert Team on Marine Climatology (ETMC) and International Oceanographic Data and Information Exchange (IODE) Committee. The Evaluation Group is comprised of three members coming from the JCOMM/ETMC and the IODE Committee. She reported on the current results of the review. Details on the MCDS development are discussed under item 4.2 (see DMCG-5 document no. 4).

2.4. Ms Iona informed the group on the latest status about the IODE Ocean Data Portal (ODP) (item 5.4) and the Standards Process for ocean management within JCOMM and IODE (item 5.2). She focused on the linkages with the European Commission (EU) Seventh Framework Programme (FP7) Ocean Data Interoperability Platform (ODIP) and the EU/FP7 Pan-European infrastructure for Ocean and Marine Data Management (SeaDataNet) projects and how DMCG activities such as metadata management could be more closely related with the above EU projects. Ms Iona recalled the importance of IODE participation in the Ocean Data Interoperability Platform (ODIP) as it will establish links between the European SeaDataNet and other countries such as US and Australia. It was recalled that IODE was represented by Ms Iona, Dr Sergey Belov (Russian Federation) and Mr Tobias Spears (Canada). It was recalled that Mr Spears is the ODP project manager (with Dr Belov being the ODP technical manager). The third ODIP workshop will be held in August 2014 in

Townsville, Australia. This should also be the target date for practical examples of linkage between ODP and ODIP. Dr Belov suggested inviting ODIP experts to the next Session of the ETDMP (proposed 23-27 June 2014).

2.5. The Group recalled the proposal from the JCOMM Management Committee to establish a JCOMM cross-cutting task team on Integrated Oceanographic Services for the WIGOS and WIS (TT-IOSSW) and discussed how more communication and networking with the other initiatives such as the MCDS, the new IODE structure, data policies for climatic data and services, and the European Marine Observation and Data Network (EMODnet) project, etc could be accomplished.

2.6. The Group decided on the following action items:

- (i) To complete the first step of the DMCG evaluation of China's CMOC application, and define next steps in this regard (**action; DMCG members; end of DMCG-5**);
- (ii) To update the MCDS-IP taking into account the IODE *ad hoc* team comments (**action; TT-MCDS & ETMC; March 2014**);
- (iii) To investigate how interoperability of ocean data systems with the WIS can be promoted, and include such requirements in the JCOMM Data Management Plan (**action; DMCG members; end of DMCG-5**);
- (iv) To take into account the forthcoming WMO 17th Congress (2015) and IOC Assembly (2015) in order to provide high level JCOMM guidance on DMPA related activities to these WMO and IOC governing bodies. The DMPA dashboard should be updated accordingly (**action; S. Iona; ASAP**).

3. REVIEW OF PRIORITY ACTIVITIES AND GUIDANCE FROM JCOMM-4

3.1 The Secretariat reported briefly on activities under, or associated with, JCOMM, and which are of direct interest to the Group. In particular, the Group noted the outcome and guidance of the Fourth Session of JCOMM, Yeosu, Republic of Korea, 23-31 May 2012.

JCOMM DMPA priority activities for 2012-2017

3.2 The Group recalled the DMPA priority activities for this JCOMM intersessional period (2012-2017) that have been duly considered within the workplans of the Group and the DMPA Expert Teams:

- a) Ocean Data Standards: See agenda item 5.2.
- b) IODE Ocean Data Portal: See agenda item 5.4.
- c) Marine Climate Data System (MCDS): See agenda item 4.2
- d) Instrument/Platform metadata: See agenda item 5.3
- e) Marine Climatology workshops (CLIMAR⁴, MARCDAT⁵): See agenda item 4.3

3.3 The Group recognized that the above priority activities are focusing on the improvement of data flow from the observation systems to the operational applications and the end users, ensuring the best use of data, verifying their quality and contributing to the harmonization of the diverse data systems. These activities were formulated to support the JCOMM specific priority areas e.g. the GFCS and WIGOS implementation and capacity development, and that their implementation is highly depended by the IOC/IODE Programme

3.4 Both WMO and IOC emphasize high priority for Capacity Development (CD), and JCOMM CD activities have been implemented within the Programme Areas (PAs) related to specialized education and training in marine meteorology, physical oceanography and data management. The Group noted that CD activities during the current intersessional period would

4 CLIMAR: JCOMM Workshop on Advances in Marine Climatology; next workshop is tentatively planned in 2014

5 MARCDAT: International workshop on Advances in the Use of Historical Marine Climate Data; next workshop is tentatively planned in 2016

maintain these general direction and principles, under the oversight of one JCOMM Management Committee (MAN) member. The Group took note of the recent change in its area, that Mr John Mungai (Kenya) replaced Mr Ali Mafimbo as member of MAN member leading the coordination of Capacity Development and Requirements. See agenda item 7 for details on Capacity Building for the DMPA.

Follow-up to MAN-10 Decisions and Actions

3.5 The Group recalled that the tenth Session of the JCOMM Management Committee (MAN-10) was held in Paris from 7 to 10 May 2013, and noted its outcome with regard to DMPA related activities.

3.6 The Group noted that the DMCG Chair has drafted the 2012-2017 DMPA Projects and Work Plans for the Intersessional Period (DMPA dashboard) taking into account the relevant decisions at JCOMM-4 and guidance provided by MAN. The Group reviewed and updated the dashboard, of which the agreed content is reproduced in **Annex IV**. The Group also noted the following actions from the Management Committee that are relevant to, and require follow-up by the Group and the DMPA Expert Teams (**action; DMCG Chair, ETMC Chair, & ETDMP Chair; asap**):

- ETMC to better communicate the benefits of the MCDS with Members/Member States; to interact more closely with the stakeholders, to liaise with GOOS regarding the development of the MCDS;
- ETMC and the new JCOMM Cross-cutting Task Team on Integrated Marine Meteorological and Oceanographic Data and Services in the framework of WIGOS and WIS (TT-IOSSW) to include the MCDS development in the discussions of the TT-IOSSW;
- Nick Mikhailov (Russian Federation) to join the IODE group on the MCDS Implementation Plan;
- Per this DMCG Session outcome, the DMCG Chair to complete the DMPA dashboard (**Annex IV**) with missing projects, including more detailed sub-projects and actions with shorter timelines and milestones for the next two years (rather than JCOMM-5);
- ETMC and the Task Team on the MCDS (TT-MCDS) to extend the MCDS deliverables to include IODE Project deliverables (e.g. QMF); and
- WMO and IOC Secretariats to promote the participation in the Ocean Data Standards and Best Practices (ODSBP) project.

3.7 The Group agreed to that JCOMM should join the ODSBP and extend a recommendation to the Management Committee in this regard (see item 5.2).

3.8 The Group noted the planned establishment of an “IODE Clearing House service for data/information management practices” to become a repository for ocean data standards and best practices documentation, and agreed that the JCOMM catalogue of standards and best practices (<http://bestpractice.iode.org>) should eventually be merged into the Clearing House. The Group therefore agreed that JCOMM should join the IODE initiative, and recommended that the standards and best practices currently documented in the JCOMM catalogue should however be flagged as “JCOMM” in the future Clearing House. The Group advised that Members and Member States should be able to submit documents by themselves to the Clearing House provided there is a mechanism allowing SG-ODSBP to moderate such submissions.

Task Team on Satellite Data Requirements

3.9 The Group noted the decision by JCOMM-4 to re-establish the JCOMM *ad hoc* Task Team on Satellite Data Requirements (TT-SAT) with new terms of reference and membership to be proposed and coordinated by the Management Committee. The Group noted the Terms of Reference and membership of the Task Team. The TT-SAT is chaired by Joel Dorandreu (CLS, France).

JCOMM Crosscutting Task Team on Integrated Marine Meteorological and Oceanographic Data and Services in the framework of WIGOS and WIS (TT-IOISWW)

3.10 The Group recalled that multiple programmes were engaged in data management activities and that there is the need to ensure the flow from observations through data management into science and services. JCOMM-4 (2012) asked the Observations Programme Area (OPA), in cooperation with the Data Management Programme Area (DMPA), to "promote the establishment and publication of access routes to the authoritative data sets for the observing system elements under its coordination." The GOOS Steering Committee (GOOS-SC-1, 2012) identified in its work plan "the challenge of data interoperability...as a first step towards developing actions." To meet these charges a study with recommendations has been made of the real-time data streams from the OCG networks. A comprehensive draft report has been completed by Bob Keeley, former DMCG chair, and needs to be reviewed by DMCG, OCG, IODE and GOOS, and the recommendations included into the relevant work plans. The Group requested its members and invited IODE to review the draft report and send comments to the OCG Chair by mid-2014 (**action; DMCG members & IODE; mid-2014**).

3.11 The Management Committee also proposed establishing a JCOMM Cross-cutting Task Team on Integrated Marine Meteorological and Oceanographic Data and Services in the framework of WIGOS and WIS (TT-IOISWW). The goal is to build on the legacy of the JCOMM Pilot Project for the Integration of Marine Meteorological and Oceanographic Observations into WIGOS, and establish a mechanism within JCOMM to overview and discuss the necessary requirements for building the architecture and the interfaces between WIS and Oceanographic services, and particularly ensure the flow of oceanographic data and products to multiple uses and users through WIS, including in particular for wave and ocean forecasting services products.

3.12 The Committee requested the JCOMM Co-Presidents, in consultation with the Programme Area Coordinators and the Secretariat to finalize the proposal, and then decide on the TT-IOISWW Terms of Reference and membership within the next few weeks after MAN-10. In particular, it was agreed that the GOOS Regional Alliances, and the IODE National Oceanographic Data Centres (NODCs) should be involved in these developments, and data policy issues considered. The draft Terms of Reference of the TT-IOISWW are provided in **Annex V**. The Group agreed that it should participate in the TT-IOISWW, and proposed the following members:

- Sissy Iona for representing the DMPA
- Tobias Spears (Canada), ODP project manager for representing the IODE
- Scott Woodruff (USA) for representing the MCDS
- David Berry (United Kingdom) for representing the Task Team on Table Driven Codes

3.13 The Group also invited Steve Foreman (WMO Secretariat) to investigate and propose a representative of WIS in the TT-IOISWW (**action; S. Foreman; 28 Feb. 2014**).

Integration of data management centres

3.14 The Group noted that JCOMM-4 has considered the need for modernization of management of surface drifter data, to rationalize the roles and functioning of the former IODE Responsible National Oceanography Centre for Drifting Buoys (RNODC/DB), the JCOMM Specialized Oceanography Centre for Drifting Buoys (SOC/DB) the Global Drifter Programme (GDP) Data Assembly Centre (DAC), and the JCOMM Ocean Data Acquisition System (ODAS) Metadata Service (ODASMS) management of metadata for the surface drifters. In the framework of the MCDS development, JCOMM-4 recommended the implementation of a modernized scheme for the management of surface drifter data within the MCDS, replacing the former RNODC/DB and the SOC/DB. The Commission therefore invited France and Canada, and other parties currently performing the functions of Data Acquisition Centres (DACs) and/or Global Data Assembly Centres (GDACs) or similar (e.g. the Global Collecting Centres (GCCs), Argo, OceanSITES, the Global Temperature and Salinity Profile Programme (GTSP), and the GDP DAC) to participate in the discussions regarding the development of the MCDS strategy and implementation plan with a view

to offering MCDS DAC or GDAC functions as appropriate. Meanwhile, the Commission approved the designation of the relevant French and Canadian centres as provisional GDAC for Drifting Buoys under JCOMM and IODE (GDAC-DB) to continue in their present roles until the role of the MCDS GDACs is further clarified as a part of the MCDS strategy. The Group expressed satisfaction of these developments, and encouraged Canada and France to strongly contribute to these developments, and invited both countries to submit applications for DAC/GDACs as appropriate for their formal evaluation and establishment. See also agenda item 4.2. The Group also noted the establishment of IODE Associate Data Units (ADU) as a new structural element per Recommendation IODE-XXII.16

Rigs and Platform metadata

3.15 The Group noted that the Terms of Reference of the Data Buoy Cooperation Panel (DBCP) have been updated in order for the DBCP to take over full responsibility for all types of Rigs and Platforms reporting meteorological and/or oceanographic measurements, and for all related aspects. As such, the DBCP is tasked to promote data exchange, including the insertion of all available and relevant platform data and metadata into the Global Telecommunication System (GTS), and the submission of data and metadata to the appropriate archives. Noting that instrument practices related to the making of observations from Rigs and Platforms are close to those for the making of observations for the Voluntary Observing Fleet, close cooperation between the DBCP and the Ship Observations Team (SOT) will be required for the definition and collection of Rigs and Platform metadata.

3.16 Mr Martin Kramp (JCOMMOPS) reported on recent activities and developments of JCOMMOPS, which will move from Toulouse (CLS) to Brest (Ifremer) by the end of the year. Three Technical Coordinators manage, analyze and compile metadata into maps and statistics for (i) Argo, (ii) SOT and GO-SHIP and (iii) DBCP and OceanSITES. The centre currently is involved in the European SeaDataNet project as a subcontractor of Ifremer and in this regard focuses on platform codes for ships, buoys and floats. Mr. Kramp also reported that the new JCOMMOPS Information System will facilitate a cross-programme view on core ocean observing systems, and the integrated ship coordination now allows for a more efficient exploitation of synergies (in particular deployment opportunities). The group appreciated the involvement of JCOMMOPS in its activities and welcomed Mr. Kramp as new member.

4. JCOMM EXPERT TEAM ON MARINE CLIMATOLOGY (ETMC) ACTIVITIES

4.1 ETMC Chairperson's report

4.1.1 The Vice-Chair of the JCOMM Expert Team on Marine Climatology (ETMC), Gudrun Rosenhagen (Germany), presented the activities and outlined the results of the meetings organized by ETMC since the fourth meeting of the DMCG (Oostende, Belgium, 2010).

4.1.2 She recalled that as a major thrust of the intersessional work, ETMC and the DMCG initiated the development of the new Marine Climate Data System (MCDS) as a follow up of the modernization of the Marine Climatology Summaries Scheme (MCSS) established in 1963. She gave an overview of the actual status of the new data system which will be one important element of JCOMM's contribution to the Global Framework for Climate Services (GFCS).

4.1.3 To realize the modernization of MCSS a new Task Team on the Marine Climate Data System (TT-MCDS) was launched replacing the Cross Cutting DMPA-OPA Task Team on Delayed-Mode VOS Data (TT-DMVOS) and the DMPA/ETMC Task Team on Marine-meteorological and Oceanographic Climatological Summaries (TT-MOCS).

4.1.4 She reported on the status of the collaboration within the International Comprehensive Ocean-Atmosphere Data Set (ICOADS, USA) Partnership' to ensure its long-term sustainability.

The partnership is anticipated to facilitate possible future formalization of ICOADS as a Centre for Marine-Meteorological and Oceanographic Climate Data (CMOC) under the WMO-IOC MCDS.

4.1.5 Besides activities detailed in paragraphs 4.2 to 4.5 below, the ETMC also addressed the following activities:

- Continued development of an improved international data rescue strategy with collaboration between ETMC, the GFCS and the WMO Commission for Climatology (CCI);
- Continued development of the Higher Level Quality Control Standard (HQCS) for integration and use within the MCDS;
- Discuss guidance regarding the masking of delayed mode data with the view to archive the data with the real callsign.

4.2 MCDS Development

4.2.1 Ms Rosenhagen recalled that per JCOMM-4 guidance, and the outcome of the ETMC-4 meeting, the collaboration with the IODE Committee has been reinforced, and the role of the IODE clarified. An important matter of discussion was the development of evaluation criteria and process. The MCDS has therefore been discussed at the twenty second Session of the IODE Committee (Ensenada, Mexico, 11-15 March 2013), which adopted Recommendations IODE-XXII.13 (IODE Global Data Assembly Centres (IODE GDACs), and IODE-XXII.14 (The Marine Climate Data System (MCDS)). IODE-22 also decided to establish an *ad hoc* team to review the Implementation Plan during the coming intersessional period. She recalled that China and Germany have submitted CMOC applications. Mr Rosenhagen explained that in light of the developing ICOADS partnership (see paragraph. 4.2.5 below) in which Germany is playing a role, and pending the application of ICOADS to become a CMOC, Germany has withdrawn its application for a CMOC (yet to be formalized). A committee was established to evaluate the proposal of China according to the agreed criteria and process.

4.2.2 Ms Iona reported on the evaluation of China's application for being established as a CMOC. While thanking China for its efforts to develop the CMOC, and recognizing the potential of the future centre to provide the required products and services, the Group agreed that China should provide additional information regarding its proposal in order to complete the evaluation. In particular, focus and details should be provided on the kind of added value products (i.e. beyond those normally provided by an NODC) the CMOC will deliver (e.g. higher level QC, bias correction, re-analysis of data, statistical products and climate summaries, data rescue), as well as on the kind of support that will be provided to the region (e.g. data rescue for specific data sets, capacity building, etc.).

4.2.3 The Group recalled that combining metadata with the data is a goal of the CMOC/China following decision of JCOMM-4 to declare the ODAS Metadata Service (ODASMS) obsolete. Ms Shaohua Lin (China) explained that higher-level quality control (e.g. removing duplicates in data sets) is also a goal of China for its CMOC together with producing statistical data, and re-analysis of data sets. Capacity Building in the region is also foreseen.

4.2.4 The Group requested China to clarify its proposal according to the evaluation criteria, and to indicate priorities (e.g. what ECVs, with timeline) and what would be the regional focus. The Group recognized that strong support has been expressed by JCOMM members during JCOMM-4 since the JCOMM Session agreed to have China operate a CMOC on a trial basis; the Group therefore considered that the corresponding criteria was met. As the CMOC is already functioning on a trial basis, the Group invited China to provide examples of statistical or higher level products in order to demonstrate its capability. The required additional information should be sent to the evaluation committee no later than 28 February 2014 (**action; L. Shaohua; 28 Feb. 2014**). The Group noted that the documentation to be provided by China may also be useful to complement and update the MCDS documentation.

4.2.5 The Group also noted the development of an international partnership for the ICOADS with participation of agencies and centres of USA, Germany, and the United Kingdom. The Group agreed that in order to preserve the MCDS integrity and legitimacy, the ICOADS (i.e. the set of products and services with corresponding functions, and not the partnership itself) should eventually make an application for becoming a CMOC, and urged the ICOADS Partnership to make sure that the ICOADS Steering Committee Terms of Reference are defined in such a way that the ICOADS is meant to become a CMOC (**action; ICOADS partnership SC; ASAP**).

4.2.6 The Group agreed that the EMODNet could also eventually include the functions of a CMOC. The Group therefore invited the DMCG Chair to approach EMODNet to investigate the opportunity for EMODNet to offer the functions of a CMOC, which relevant parts could eventually be established as such (**action; S. Iona; ASAP**).

4.2.7 The Group requested the Secretariat to write to Members/Member States already participating in the MCSS, and/or running DACs/GDACs to invite them to consider submitting applications for MCDS DACs and GDACs, and to provide enough detail so that their application can be evaluated against the agreed criteria (**action; Secretariat; ASAP**).

4.2.8 The Group also requested the Secretariat to update the MCDS webpages with the latest information, in particular with regard to the CMOCs role, the link with the IODE, and communicating the benefits of the MCDS (**action; Secretariat; ASAP**).

4.3 CLIMAR-4

4.3.1 Ms Rosenhagen reported on the preparation of the Fourth JCOMM Workshop on Advances in Marine Climatology (CLIMAR-4), which is planned in Asheville, USA from 9 to 12 June 2014. The major goals of the CLIMAR-4 workshop are:

- (i) to highlight the societal benefits of the applications of marine climatology, including for climate services;
- (ii) to review the needs of the scientific and operational communities for marine climate data and products;
- (iii) to assess the state of the marine climate data component of the global climate observing system, identify gaps, and provide guidance on how to address them;
- (iv) to review ongoing developments in the integration of observations across multiple observing domains (land - lower atmosphere / surface ocean - deep ocean - space); and
- (v) to encourage submissions to the Dynamic Part of the WMO Guide to the Applications of Marine Climatology.

4.3.2 The Group was pleased to hear that the meeting is now scheduled as planned per JCOMM-4 guidance, concurred with the proposed goals above, and noted that the Invitation letters and call for papers are now about to be issued.

4.3.3 The Group agreed with the proposal from the ETMC acting Chair to organize an informal meeting of the ETMC and Task Team on MCDS on side of CLIMAR-4 (**action; G. Rosenhagen; June 2014**).

4.4 Sea-ice and wave climatologies

4.4.1 On Sea-ice climatologies, the Group agreed that stronger link should be established with the Expert Team on Sea-Ice (ETSI) so that such information could be included in the products eventually delivered through the future CMOCs. The Group requested the ETMC Vice-Chair to approach the ETSI Chair in this regard in the view to develop a workplan (**action; G. Rosenhagen; ASAP**). The Group noted that the fifth ETSI meeting is planned from 25 to 28 March in Ottawa, Canada, and that the ETMC will be providing written input from the meeting. The Team agree that it would be useful for the ETMC to be represented at the meeting even through teleconference,

and invited Mr Rosenhagen to make sure this will be the case (**action; G. Rosenhagen; Mar. 2014**).

4.4.2 On wave climatologies, the Group recalled the good cooperation happening between the ETMC and the Expert Team on Waves and Coastal Hazards Forecasting Systems (ETWCH) for developing the global extreme wave event archive.

4.4.3 The Group noted with appreciation that pilot activities are underway to scan existing databases that contain comprehensive records of wave observations (e.g. OGP⁶, GlobWave altimeter data base), and to include related climatologies into the ICOADS. The Group requested to the ETMC to continue the collaboration with the ETWCH in this regard, and to report on progress to the DMCG Chair before the next JCOMM Management Committee meeting (**action; G. Rosenhagen; Sept. 2014**).

4.4.4 The Group noted that progress with regard to the possible production of wave monthly summaries (e.g. using the wave data from ships and buoys in ICOADS) will depend on efforts to develop the methodology and construct the summaries. It requested the ETMC to discuss the issue with the ICOADS in the view to speed up the process (**action; ETMC; ASAP**).

4.4.5 The Group invited the ETWCH to collaborate with the ETMC in developing the plan for a storm surge climatology, noting that Scott Woodruff has been designated by the ETMC as contact point in this regard (**action; ETWCH; ASAP**). In particular, the Group noted that the UK is actively creating a storm surge climatology (from sea level observations) which will act as best practice for further development. This work will be presented in a suitable forum (maybe the 2015 international storm surge meeting which ETWCH is planning to organize).

4.4.6 The Group also recalled that there has been recommendations from CLIMAR and MARCDAT workshops regarding the possible production of wave monthly summaries (e.g. using the wave data from ships and buoys in ICOADS). However, no substantial progress was noted until the situation of the ICOADS is clarified and well on track.

4.5 Link with CCI

4.5.1 The Group discussed existing and future JCOMM collaboration with the WMO Commission for Climatology (CCI).

4.5.2 The CCI is guiding WMO on the implementation of the WMO World Climate Service Program (WCSP⁷) through four Panels of CCI Experts (OPACEs) as described in its current structure⁸.

4.5.3 The Group noted that after ETMC-4, the ETMC Vice-Chair has been in contact with the CCI President and other CCI experts in order to explore how future collaborations could be developed. From those discussions it appeared that the logical connection would be with the Open Panels of CCI Experts (OPACEs) number 1 (OPACE1), Climate Data Management. OPACE-1 hosts the Expert Team on climate data management systems (ET-CDMS) and a Task Team on Data Rescue. OPACE-1 has predominantly been focusing on building Data Management Capacities at the national level with provision of training and tools. CCI will discuss at its forthcoming session in July the establishment of the Global Data Management Framework for Climate (DMFC) which aims at integrating existing infrastructure for data management at national, regional and global levels through high performance and standard procedure to support the data needs based of WCP and GFCS user requirements, including (i) Enhanced access, and timeliness of climate data; (ii) Consistent procedures in dealing with some computational aspects, including; (iii) Use WIS for the discovery and access of archived climate data in this three levels; and (iv) Data Traceability, Metadata, and Quality assurance and Quality Control.

6 International Association of Oil and Gas Producers (OGP) Metocean Committee

7 http://www.wmo.int/pages/prog/wcp/index_en.html

8 <http://www.wmo.int/pages/prog/wcp/ccl/cclstructure.php>

4.5.4 The Group recalled that Data Rescue (DARE) is an integral part of the World Climate Services Program with a long-term goal of rescuing and digitizing climate records. A focus is made on those records at risk of loss. DARE enables climate science and climate services by making readily available long and high quality climate datasets needed for progressing science in Climate variability and climate change assessment, modeling, calibration of satellite data, etc. as well as in Sector applications for Agriculture, Water Resources, Energy, and Climate Early Warning, Risk Management and Disaster Risk Reduction.

4.5.5 The Group also recalled that OPACE-2 is relevant to this meeting as it hosts among other teams, the Joint CCI/WCRP-CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI⁹). ETCCDI worked for more than a decade on developing simple and useful climate indices to characterize the changing nature of extremes. It promoted the use of these extremes through scientific publications, which have been developed through a series of regional workshops. WMO published guidelines on the definition and use of these indices and they are available on the web¹⁰. Twenty seven (27) climate indices have been developed and are being used for analyzing climate extremes related to temperature and precipitations. During the past three years ETCCDI workshops were held in Asia (China, 2013), North Africa and Middle East, (Morocco, 2012), the Caribbean (Jamaica, 2012), West Africa (Gambia, 2011), and South America, (Ecuador, 2011). These workshops are designed to address the specific needs in climate change detection and indices, provide training to national experts. The size varies according to the regions from 10 to 20 participants. 4 to 5 days are usually used for a combination of seminars and hands-on data analysis. These workshops often resulted in a scientific paper published in peer-reviewed journals. The Group noted that while JCOMM has developed a series of marine indices, there have not yet been fully considered by the ETCCDI which has been focusing on atmospheric indices so far.

4.5.6 The ETCCDI and CCI Task Team on Climate Data Rescue recommended the establishment of the International Climate Assessment and Data sets (ICA&D), building on the successful European Climate Assessment and Data Sets and that it be expanded to other regions. So far four components have been set up in West Africa (WACADARE), South East Asia (SACA&D), Latin America (LACA&D), in addition to the mother component ECA&D in Europe.

4.5.7 The Group noted that an international Workshop on the recovery of climate heritage of the Indian Ocean rim countries and Small Island Developing States is planned to take place in Mozambique, Maputo 21-23 April 2014, with the participation of NMHS, CCI, GFCS, JCOMM, ETCCDI, ACRE, and other international projects and initiatives. The workshop will provide a road map to develop an Indian Ocean Data Rescue Initiative (INDARE) supporting ICA&D. Marine and atmospheric data will be both considered. More information can be found on the web¹¹.

4.5.8 The Group discussed the CCI activities where the DMPA could potentially collaborate. These include:

- Linking JCOMM and CCI Data initiatives and Data Rescue. It is proposed that once CCI makes progress with its proposed GDMFC, there should be a potential for integrating JCOMM and CCI Global Data initiatives;
- WIGOS and WIS would be supporting pillars of these initiatives on Quality assurance and exchange respectively, while the Climate Service Information System CSIS of the GFCS would be the driving System for such an integration as WWW does for weather data processing and exchange;
- There is a potential to set up, at the upcoming CCI session, a joint working mechanism involving several commissions and programs (e.g. Inter Programme Expert Team on GDMFC);

9 <http://www.clivar.org/organization/etccdi/about-us/about-us>

10 http://www.wmo.int/pages/prog/wcp/wcdmp/documents/WCDMP_72_TD_1500_en_1.pdf

11 <https://sites.google.com/a/met-acre.org/acre/meetings-and-workshops-1/IODRW4.pdf?revision=1>

- JCOMM input to the WMO Annual Statement on the Status of the Global Climate, possibly by adding information on variability of the salinity, updates on impact of sea level raise on the severity of tropical cyclone and any other key aspect that could highlight the influence of Ocean on the global climate;
- There is a potential for a contribution to the newly planned publication on the Status of African Climate starting from 2013. This publication will serve as high level showcase for WMO and its partners contribution to the GFCS activities in Africa; and
- Recognize the importance of the planned South American workshop on Marine indices with CIIFEN as a good opportunity to demonstrate the use of marine indices for providing useful services to the users.

4.5.9 While noting that the MCDS is in an advanced stage of development compared to the CCI DMFC, the Group agreed that strong collaborations will have to be put in place between the CCI DMFC and the MCDS.

4.5.10 The Group noted that the Commission for Climatology Management Group meeting in Geneva in October 2013 stated that in future there is a need to spread their activities across a broader group of experts by engaging also JCOMM. Accordingly, plans to reorganize CCI, included among others a new group of Rapporteurs on observational issues taking into regard JCOMM.

4.5.11 The Group agreed that a closer co-operation of ETMC with CCI would be of mutual benefit. It requested the ETMC Vice-Chair to continue the discussion with the CCI Experts and to use the chance of intensifying the contact at the 16th session of CCI, which is going to take place in Heidelberg, Germany in early July 2014 (**action; G. Rosenhagen; 15 May 2014**).

4.5.12 The Group invited its members to propose information and recommendations for the forthcoming CCI Session through the DMPA Coordinator, and the DMPA Coordinator to agree with the ETMC Chair on what information and recommendation to actually submit to the CCI (**action; DMCG members & DMCG & ETMC Chairs; 15 May 2014**).

5. IODE-JCOMM EXPERT TEAM ON DATA MANAGEMENT PRACTICES (ETDMP) ACTIVITIES

5.1 Chairperson's report

5.1.1 The Chair of the Joint JCOMM/IODE Expert Team on Data Management Practices (ETDMP), Dr Sergey Belov (Russian Federation) reported on the activities of the ETDMP. His report is essentially based on the outcome of the Third Session of the ETDMP (Oostende, Belgium, 16-19 October 2012) reflected in JCOMM-MR-096, which contains the details of ETDMP activities and work plan.

5.1.2 Dr Belov also informed the meeting about the outcome of the Twenty Second Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE-XXII, Ensenada, Mexico, 11-15 March 2013) where activities of the ETDMP were also reported. It was noted that ETDMP is the core link between IODE and JCOMM and is therefore essential to ensure that the outcomes of the Expert Team and its task teams are related to the priorities of the JCOMM Data Management Programme Area (DMPA), and that concrete results can be shown. It was also highlighted that having strong governance from the ETDMP and the IODE Steering Group for the Ocean Data Portal (SG-ODP) project will lead to more targeted objectives and improvement of the technology developed by the Partnership Centre for the IODE Ocean Data Portal (ODP). The IODE Committee adopted Recommendation IODE-XXII.7 (the revision of the Terms of Reference of the IODE Steering Group for the IODE Ocean Data Portal Project); Recommendation IODE-XXII.8 (Terms of Reference of the Structural Elements of the IODE Ocean Data Portal) and Recommendation IODE-XXII.9 (Terms of Reference of the Partnership Centre for the IODE Ocean Data Portal).

5.1.3 Dr Belov recalled that the ETDMP membership has been renewed by JCOMM-4 (Yeosu, Republic of Korea, May 2012), and following the IOC Circular Letter 2443 on 6 June 2012, IOC had elected additional members of the Expert Team. In accordance with the work directions, the relevant ETDMP Task Teams were created and appointed at ETDMP-3 and their work plans were agreed upon. The revised membership is available from the web¹². It was noted that several members had changed positions since their joining the Team.

5.1.4 Dr Belov also recalled that the ETDMP activities are focusing on fulfilling the recommendations of:

- (i) The IOC Committee on International Oceanographic Data and Information Exchange (IODE): Recommendations IODE-XX.3, IODE-XXI.4, IODE-XXII-5 (Ocean Data Standards Pilot Project), IODE-XXII-6 (Ocean Data Standards and Best Practices Project), IODE-XXII-7 (Revised Terms of Reference of the IODE Steering Group for the IODE Ocean Data Portal), IODE-XXII-8 (Terms of Reference of the Structural Elements of the IODE Ocean Data Portal), IODE-XXII-9 (Terms of Reference of the Partnership Centre for the IODE Ocean Data Portal) ;
- (ii) Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM): Recommendations 1(JCOMM-3), 4(JCOMM-3), and 3 (JCOMM-4).

5.1.5 The main ETDMP activities were concentrated on the following items:

- (i) conducting the IODE/JCOMM Standards Process (ODS);
- (ii) improving the metadata management;
- (iii) development of the ODP and establishment of interoperability with the WMO Information System (WIS, see agenda item 8.1.1), SeaDataNet and other projects.

5.1.6 The Group reviewed the ETDMP workplan for its intersessional period, included actions identified during this meeting for the ETDMP, and approved it. The Group identified the importance of establishing broader cooperation with related activities such as the WMO Information System (WIS), the Global Earth Observing System of Systems (GEOSS), the IOC-WMO-UNEP-ICSU Global Ocean Observing System (GOOS), and the the Pan-European Infrastructure for Ocean & Marine Data Management (SeaDataNet). The Group highlighted the needs of adoption of internationally endorsed metadata standards i.e. ISO 19139 with relevance to other communities experience and expertise.

5.1.7 The Team requested the Secretariat to investigate finding a replacement for Richard Crout (USA) in the ETDMP membership (**action; WMO Secretariat; ASAP**).

5.1.8 The Team requested the Secretariat to contact Brazil and find a replacement for Mr Paulo Polito (Brazil) who does not seem to take an active role in the activities of the ETDMP (**action; IOC Secretariat; ASAP**).

5.1.9 The activities above are discussed under agenda items 5.2, 5.3, and 5.4 respectively below.

5.2 Ocean Data standards, and best practices

5.2.1 Dr Belov reported on the progress achieved by the ETDMP Task Team for Ocean Data Standards (ODS). This includes:

- (i) The *ad hoc* ODS Meeting in April 2012 agreed on Best practices procedures;
- (ii) The IOC published within IOC/UNESCO Manuals and Guides No. 54 (a) the standard for country codes as volume 1; (b) the standard for 'Date and Time' as volume 2; and (c) the standard on QC Flags as volume 3;

¹² http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=118

- (iii) Some standards have been submitted through the process: e.g. Proposal to adopt a quality flag scheme standard for oceanographic and marine meteorological data exchange (see website¹³);
- (iv) Other standards have been identified for submission : e.g. Latitude, Longitude and Altitude, Units, etc.; and
- (v) The Terms of Reference of the Ocean Data Standards and Best Practices Project (ODSBP) were drafted for consideration by IODE-XXII.

5.2.2 The Group agreed on the following actions and to update the Data Management Plan and its Implementation Details (see agenda item 9) accordingly (**action; S. Belov; ASAP**):

- (i) To continue to develop standards/best practices for submitted proposals in the marine community through the IODE/JCOMM Standards Process as outlined by JCOMM-4 and IODE-XXII;
- (ii) To ensure interoperability arrangements between data systems such as Ocean Data Portal (ODP), WMO Information Systems (WIS), Global Earth Observation System of Systems (GEOSS), Global Ocean Observing System (GOOS) and others respectively used standards and best practices;
- (iii) To encourage, by preparing and distributing an invitation for submissions, experts in respective communities to propose standards and best practices to be submitted to the ODSBP (**action; IOC Secretariat; ASAP**); and
- (iv) To publicize adopted standards and best practices in respective communities in order to promote their usage (**action; IOC Secretariat; ongoing**).

5.2.3 Dr Belov informed the Group that IODE-XXII had adopted Recommendation IODE-XXII.5 through which the three standards, referred to in 5.2.1 (ii) above were formally adopted by IODE (and subsequently by the IOC Assembly in June 2013). IODE-XXII had furthermore adopted Recommendation IODE-XXII.6 through which it established the Ocean Data Standards and Best Practices Project (ODSBP). That Recommendation also requested that the JCOMM/IOE Ocean Data Standards be closed, and it invited JCOMM to join the Ocean Data Standards and Best Practices Project. The Group agreed that JCOMM should join the ODSBP and requested the DMCG Chair to invite the Management Committee to give its formal agreement (**action; DMCG Chair; MAN-11**).

5.2.4 Dr Belov noted that no candidate standards are under review now so there is a need to encourage Members/Member States to submit acceptable standards to the ODSBP. He informed the Group that a session of the Steering Group had been planned by the IODE Officers (who met in Geneva between 27-28 January 2014) to take place in 2015.

5.3 Metadata Management

5.3.1 Dr Belov reported on the activities of the ETDMP in the area of metadata management. He noted that progress has been made with regard to defining a standard for discovery metadata structure and performing discovery metadata profile comparisons. The Task Team was also instructed to consider ODAS metadata and the Water Temperature Metadata Pilot Project (META-T). Regarding the latter this work was completed and legacy recommendations were made (see JCOMM-4 report¹⁴, paragraph 7.05).

5.3.2 The Group agreed on the following actions (**action; ETDMP; end 2014**):

- (i) To continue to review and compare specific vocabularies and code lists used in other projects, programmes and initiatives such as the WIS, and the Ocean Data Interoperability Platform (ODIP);

¹³ http://www.oceandatastandards.org/index.php?option=com_content&view=article&id=44&Itemid=49

¹⁴ WMO-IOC/JCOMM-4/3 WMO-No. 1093 –

http://www.jcomm.info/index.php?option=com_oie&task=viewDocumentRecord&docID=9774

- (ii) To recommend standards and best practices for used vocabularies and code lists; and;
- (iii) To consider a creation of knowledgebase service that will inform users about existing controlled vocabularies and similar authority systems.

5.3.3 Dr Belov noted that (iii) above is covered by the IODE Clearing House Service for Data/Information Management Practices project established by IODE-XXII through Recommendation IODE-XXII.19. He further referred to the work plan of the Task Team included in Document 5.

5.3.4 Dr Belov then briefly presented the report received from Donald Collins (US NODC) regarding each activity: (i) Activity 2: review and compare priority vocabularies: it was reported that little progress was made in identifying common metadata attributes or comparing the content of several controlled vocabularies but it has been very slow progress. US NODC and ICES made extensive progress in resolving content discrepancies in our respective platforms vocabularies and are continuing that collaboration. Mr Collins participated in discussions at the 2013 Ocean Data Interoperability Platform (ODIP) workshops and has been working with OBIS-US on archiving and providing access to US biogeographical data and metadata (ii) Activity 3: recommend ways to use XML-based vocabulary management tools (e.g. SKOS, MMI): some progress was made in learning more about the use of Simple Knowledge Organization System (SKOS) as a technology to provide an XML-based framework for sharing and exchanging controlled vocabulary content in a more standards-based approach. For example, the US NODC developed a preliminary SKOS service endpoint (not yet in production or accessible to the public) and had discussions with BODC/SeaDataNet staff about the different approaches for representing our information in SKOS. During 2014, US NODC is focusing on transitioning to an ISO-oriented metadata management capability and integrating our data discovery tools with the ISO metadata framework. US NODC and the other US NOAA Data Centers have developed XSLT files for presenting ISO metadata in an easily-read HTML representation. We have also begun issuing Digital Object Identifiers (DOI) for geospatial data. The three NOAA Data Centers use the same service to create the DOI (EZID) and present the ISO metadata in a uniform fashion to users via the XSLT style sheet.

5.3.5 The Group recommended for the JCOMM ETDMP Task Team on metadata to collaborate with the JCOMM DMPA Task Team on table driven codes (TT-TDC) (***action; ETDMP TT-metadata; 2nd quarter 2014***).

5.4 Ocean Data Portal

5.4.1 Dr Belov reported on the work achieved with regard to the IODE Ocean Data Portal (ODP). Activities have been focusing on two main aspects: (i) to involve new data providers from the National Oceanographic data Centres (NODCs), Designated National Agencies (DNAs), and other IODE related projects and (ii) development of ODP V2. During the inter-sessional period four data providers were connected. Significant contribution has been made for the Global Temperature and Salinity Profile Project (GTSP) and Argo projects by the US NODC, the Integrated Science Data Management (ISDM, Canada). At present ODP is giving access to 100 datasets with over 1 000 000 profiles from NODCs/DNAs. The ODP V2 technology has been released implementing a new enterprise architecture and new functional model that includes a global node, regional/specialized nodes (eg based on ODINs or IODE and non IODE projects, programmes and initiatives) and national nodes. He noted that IODE-XXII had abolished DNAs and established Associate Data Units (ADUs) as new structural element of IODE.

5.4.2 Dr Belov further informed the Group that the National Oceanographic Committee of the Russian Federation established and is now hosting the Partnership Centre for IODE ODP at the All-Russian Research Institute of Hydrometeorological Information-World Data Center (RIHMI-WDC) / NODC of Russia in Obninsk. RIHMI-WDC prepared and submitted to Roshydromet the business plan for the Partnership Centre for the IODE ODP for 2014-2016. The support includes 2 full-time and 2 half-time staff positions as well as 4 assistants from the NODC. The team is headed by Dr Sergey Belov, ODP technical manager. The tasks of the Partnership Centre are as follows:

(i) develop, host and maintain the tools and specifications for the portal and its distributed marine data system operation; (ii) assist IODE's Ocean Data Information Networks (ODINs), NODCs and other IODE ODP nodes to achieve their regional and thematic objectives; (iii) develop, strengthen and maintain the IODE ODP data management training programmes and tools; and (iv) monitor and report on the status and availability of the IODE ODP portal, websites, tools and specifications used by the IODE ODP node. In addition, Canada has offered (as from 2013) the services of Mr Tobias Spears as ODP project manager (working from Canada). The IODE Steering Group for the IODE Ocean Data Portal met in Obninsk in September 2013.

5.4.3 Dr Belov further informed the Group that a national ODP system was established at SNDM Argentina in October 2013 following on-site training at the MINCYT. The SNDM data portal is available at <http://portal.mincyt.gob.ar> and provides access to 8 data centres of Argentina. In terms of collaboration with GEOWOW, the GEOWOW team is currently working with the project office in Oostende to host their data and build their infrastructure. When this work is completed, we will continue the ODP node or data provider implementation for GEOWOW. Korea is intending to use the ODP Light Data Provider. Some sample data sets were provided. The next step is to coordinate at the national level. When new infrastructure is available at the Partnership Centre (October) then they will host the light data providers. ODP is participating in key global partnerships (such as the development of interoperability connections with GEOSS under the Ocean Data Interoperability Platform) and these arrangements present new opportunities to evolve the ODP technical architecture and the contributions to the ODP.

5.4.4 The Group noted that IODE is participating in Ocean Data Interoperability Platform which has a significant number of different experts related to ETDMP activities. In light of the knowledge gained in the participation of ODP/ETDMP members in the 2nd Ocean Data Interoperability Platform (ODIP) workshop (La Jolla, December 2013), a number of ongoing IODE activities should be re-evaluated with the goal of leveraging the international expertise that already exists and continues to be developed.

5.4.5 The Group agreed on the following ETDMP TT for ODP actions (**action; ETDMP & TT-ODP; end 2014**):

- (i) To continue to liaise and collaborate with external group of experts from different projects, programmes and initiatives (i.e. WIS, GEOSS, GOOS, ODIP, etc) in order to establish interoperability and data/services accessibility;
- (ii) To assess the deployment of the ODP nodes with assistance of the Partnership Centre for IODE ODP;
- (iii) To ensure implementation of standards and best practices published via ODSBP; and
- (iv) To identify and recommend standards and best practices to be proposed to the OBSBP.

5.4.6 Dr Belov further informed the Group that a course will be organized in Oostende in March 2014 to provide training to ODINAFRICA partner countries so after the training they can initiate establishment of national nodes and regional node in Africa. Similarly training is planned in China where possibly an ODP node for the WESTPAC region could be established. The Group requested the IOC Secretariat to invite the IOC Sub-Commission for WESTPAC to consider this possibility (**action: IOC Secretariat; next Session**)

6. QUALITY MANAGEMENT

6.1 WMO Quality Management Framework (QMF)

6.1.1 The Group recall guidance from the WMO Sixteenth Congress (Geneva, Switzerland, May 2011), and Resolution 26 (Cg-16) regarding the WMO Quality Management Framework (QMF) and noted that comprehensive information on the QMF is available from the QMF

website¹⁵, which is kindly hosted by the Australian Bureau of Meteorology (BoM). Resolution 26 (Cg-16) is particularly recommending a full integration of the QMF into the wider WMO strategic and operational planning process as part of a holistic management system encompassing quality management, risk management, results-based management, as well as monitoring and evaluation. It also urges the technical commissions to explore opportunities to develop new common Technical Standards under the Working Arrangements¹⁶ between ISO and WMO.

6.1.2 The Group further noted the guidance from JCOMM-4 with regard to Quality Management, and developments that took place in this area under JCOMM since then, particularly through the Management Committee. In particular, it was recalled that JCOMM-4 agreed that JCOMM should continue to encourage a quality management approach to the delivery of met-ocean data, products and services, and requested the Management Committee to coordinate the related intersessional activities.

Quality Management certification

6.1.3 On the implementation of Quality Management Systems, and Quality Management Certification, the Group recalled that marine meteorological and oceanographic data management contributed essentially to the elaboration of the data and products required for delivering end user metocean services. Quality management in data management should therefore be part of and contribute to the overall quality management required for marine and ocean forecasting systems and services. From that perspective, the Group requested the DMPA Coordinator to liaise with the JCOMM Services and Forecasting Systems Programme Area (SFSPA) Coordinator, in the view to update the JCOMM Data Management Plan and its Implementation Details so that the DMPA quality management requirements are properly taken into account and complement those for metocean services (**action; S. Iona; end 2014**).

Marine Weather Forecaster Competence Framework

6.1.4 The Group noted the process in the follow-up to the Recommendation 5 (JCOMM-4) – *Quality Management Implementation for JCOMM*, to develop globally acceptable requirements for marine meteorological and oceanographic services. The *ad hoc* Task Team on Marine Competency Requirements (TT-MCR¹⁷) under the leadership of Mr Brian Boase (Australia) has developed a draft for marine weather competency framework, as a minimum baseline standard of competence considered necessary to perform the duties of a marine weather forecaster (MWF). The Group agreed to the analysis of the Task Team, that there would be considerable variation in the legitimate functions of Marine Weather Offices worldwide. The competencies should therefore be adopted for the respective regional/national functions and priorities.

6.1.5 The Group noted that plan and timeline associated with this activities, that the final draft framework for Marine Weather Forecaster Competence would be submitted to the seventeenth WMO Congress in 2015, through the endorsement of the JCOMM Management Committee. The Group noted that consolidated feedback from DMPA Teams on the draft should be provided to the TT-MCR prior to the eleventh JCOMM Management Committee (planned October 2014), and requested the DMPA Coordinate to coordinate the review by DMPA Teams and experts and to liaise with the TT-MCR Chairperson. (**action; S. Iona; Aug. 2014**).

6.1.6 See also agenda item 7 on Capacity Building.

JCOMM Catalogue of Standards and Best Practices

6.1.7 On the JCOMM Catalogue¹⁸ of Standards and Best Practices, the Group agreed that the current version of the Catalogue required updating, and recognized that the catalogue ought to be

15 http://www.bom.gov.au/wmo/quality_management/index.shtml

16 Working arrangement exist between WMO and ISO since December 2007, where the ISO council has agreed to recognize WMO as an International Standardizing Body.

17 <http://www.jcomm.info/TT-MCR>

18 <http://bestpractice.iode.org/>

kept up to date on a routine basis. The Group agreed that a specific mechanism should be put in place for keeping the catalogue up to date. The Group noted that the Twenty-second Session of the IODE Committee (Ensenada, Mexico, 11-15 March 2013) established an IODE Clearing House Service for Data/Information Management Practices project through Recommendation IODE-XXII.19. The Group agreed to integrate the JCOMM Catalogue into the IODE Clearing House while flagging all Catalogue entries as “JCOMM”.

6.1.8 The Group also recalled that the JCOMM Catalogue includes standards and best practices crosscutting between all Programme Areas of JCOMM and did not therefore include only ocean data management related documents. The Group requested Ms Shaohua Lin to investigate with the National Centre of Ocean Standards and Metrology (NCOSM) of the State Oceanic Administration (SOA) of China whether NCOSM could take up the role to coordinate the JCOMM entries in the IODE Clearing House, in coordination with the responsible JCOMM Groups, and Expert Teams (**action; S. Lin; ASAP**). The Group requested Ms Lin to report on this issue to the Management Committee via the DMCG Chair (**action; S. Iona; Oct. 2014**).

6.1.9 Regarding ocean data management documents flagged as “JCOMM” in the Clearing House, the Group requested the Chairs of the IODE Committee, the ETMC, and the ETDMP to regularly check the documents for the publications and documents they are responsible of, and to propose changes if required (**action; IODE, ETMC, ETDMP Chairs; ongoing**). It was noted that the JCOMM Catalogue currently defines what group or team is responsible for what document.

6.1.10 The Group agreed that the repository (i.e. IODE Clearing House) should be Open Archive Initiative (OAI) compliant so best see if we can use DSpace software and possibly extend the metadata structure to allow additional functionality (searching for e.g. IODE, WMO, JCOMM, ... documents) and can be searched as such. The Group requested IODE GE-MIM to address this as soon as possible (**action; IODE GE-MIM; ASAP**).

6.1.11 The Group nominated Etienne Charpentier (WMO Secretariat) to act as focal point for integrating the existing JCOMM catalogue into the IODE Clearing House repository, and for discussing its functional specifications with the IODE Group of Experts on Marine Information Management (GE-MIM) and the IODE Project Office (**action; E. Charpentier; 31 Mar. 2014**).

WIGOS Regulatory Materials

6.1.12 The Group also noted the WMO Integrated Global Observing System (WIGOS) Task Team on Regulatory Materials (TT-WRM) is developing new Technical Regulation (including in particular a WIGOS Manual and a WIGOS Guide). JCOMM is represented in the Task Team by Mr Chris Marshall (Canada). The Group invited Martin Kramp to get in touch with Mr Marshall on behalf of the Group in order for the DMPA requirements to be taken into account when developing WIGOS Regulatory Materials (**action; M. Kramp; ASAP**).

Possible joint WMO-ISO standard(s) for DMPA

6.1.13 On the development of common WMO-ISO standards relevant to JCOMM Data Management activities, the Group agreed that there was no need at this point to promote any specific standard.

6.1.14 The Group also recalled the work done by JCOMM on standards through the Ocean Data Standards (ODS¹⁹) pilot project (see agenda item 5.2). In particular, the Group noted that *Recommendation for a Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data* has been published as part of Volume 3 of IOC Manuals and Guides No. 54²⁰. IODE-22 also decided that the JCOMM/IODE Ocean Data Standards Pilot Project was completed, and established the Ocean Data Standards and Best Practices (ODSBP) Project through Recommendation IODE-XXII.6.

¹⁹ <http://www.oceandatastandards.org/>

²⁰ http://www.iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=10762

6.2 IODE quality Management Framework

6.2.1. Mr Greg Reed, IODE Past-Chair, reported briefly on progress to develop the IODE Quality Management Framework for National Oceanographic Data Centres. He recalled that the IODE Committee had long held the view of a need for 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 and to ensure NODCs can provide data of known quality to meet the requirements of a broad community of users. An additional element stressing this need was that IODE had been accepted as a network member of the ICSU World Data System (WDS) and, as a contributing member of WDS, NODCs would be required to demonstrate their capability to meet International Council for Science (ICSU) certification criteria.

6.2.2. The IODE Quality Management Framework (IODE-QMF) provides the overall strategy, advice and guidance for NODCs to develop and implement quality management systems (QMS) for the successful delivery of oceanographic and related data, products and services. To ensure an NODC is able to provide quality data to meet the requirements of a broad and varied community of users, including ODP and WDS, an accreditation process will be implemented based on compliance to a set of requirements that can be translated into quantitative indicators, which will be part of a regular review of an NODC. In order to obtain and maintain accreditation, an NODC will need to fulfil a minimum set of requirements to ensure compliance with IODE standards and to establish a mechanism to regularly monitor and assess the quality of data and service. These accreditation criteria are given in the IODE Quality Management Framework for National Oceanographic Data Centres document. IODE capacity development, centred on OceanTeacher, will focus on providing the necessary training so that all NODCs can achieve full accreditation. Quality management will be included in the OceanTeacher training programme.

6.2.3. The IODE Committee, at its 22nd Session (Ensenada, Mexico, 11-15 March 2013) adopted Recommendation IODE-XXII.18 (Establishment of the IODE Quality Management Framework Project). As part of that Recommendation, the Committee established the Steering Group for the IODE Quality Management Framework (SG-QMF). The Committee requested the Secretariat to seek nominations for membership of the SG-QMF from both long-established NODCs and newly established NODCs. To this end, invitations to nominate members were invited from the IODE National Coordinator for Data Management (email of 17 April 2013). The IODE Officers selected suitable members as listed on the IODE website²¹. In order to include expertise from the JCOMM and WMO communities, the Officers also invited Ms Helen Tseros (Coordinator Quality Management, Australian Bureau of Meteorology) to join the Group, which has been accepted.

6.2.4. The initial tasks for the SG-QMF will be to review the IODE Quality Management Framework (IODE-QMF) documentation, including confirming the IODE accreditation requirements for NODCs, the procedures to apply for accreditation and preparing quality management templates. The SG-QMF will seek endorsement from the IODE Committee (by email) on the requirements and procedures for accreditation of NODCs, considering the ICSU Catalogue of Criteria for WDS Certification.

6.2.5. The IODE, through its QMF, can support the development and implementation of Quality Management Systems for MCDS and its CMOCs.

6.2.6 The revised draft version of the "IODE Quality Management Framework for National Oceanographic Data Centres" (IOC Manuals and Guides No. 67) was prepared by Mr Reed in December 2013 and was approved for publication by the 2014 Session of the IODE Officers (Geneva, 27-28 January 2014). It is expected to be published and posted on the IODE web site in February 2014. The current IODE NODCs will subsequently be invited to apply for accreditation.

²¹ http://iode.org/index.php?option=com_oe&task=viewGroupRecord&groupID=281

7. CAPACITY BUILDING ACTIVITIES

7.1 Cooperation between WMO Education and Training Programme and the IODE OceanTeacher Global Academy

7.1.1 Mr Greg Reed, IODE Past-Chair, reported on this agenda item. He started by noting that capacity building has been a cornerstone of the IODE activities since its establishment in 1961. It aims at assisting Member States to acquire the necessary capacity to manage research and observation data and information and become partners in the IODE network as well as to teach the principles of data and information management and promote the use of standards amongst all IODE centres and thus achieve interoperability amongst them. OceanTeacher²² is IODE's Capacity Development tool and has been developed as a training system for ocean data managers (working in ocean data centres), marine information managers (marine librarians) as well as for marine researchers who wish to acquire knowledge on data and/or information management. Furthermore, OceanTeacher is being used for training in other related disciplines. OceanTeacher is currently a comprehensive web-based training system that supports Classroom training (face-to-face), Blended training (combining classroom and distance learning), online tutoring and online self-learning. Classroom courses are organized either at the IOC Project Office for IODE (Oostende, Belgium) or other training facilities.

7.1.2 IODE's **OceanTeacher** is now evolving into a new phase and will soon become the **OceanTeacher Global Academy (OTGA)**. The new OTGA project, funded by the Government of Flanders (Kingdom of Belgium) between 2014-2018, will build upon and expand the existing OceanTeacher Academy based at the IOC Project Office for IODE in Oostende, Belgium, to a truly worldwide training facility. OTGA will provide a programme of training courses related to IOC programmes (including IODE, IODE/OBIS, IODE/ICAN²³, HAB²⁴, ICAM²⁵, GOOS, Tsunami, JCOMM, etc). Courses will be organized and content provided through the OceanTeacher Learning Management System (OT LMS). The innovative component of the new OTGA is that a course will take place simultaneously at different places and be attended by students from two or more regions simultaneously. Teachers and students in different Regional Training Centres (RTCs) will be able to communicate in real time through advanced information technology (e.g. internet-based technologies such as video conferencing, video streaming etc. between the different RTC's). Furthermore, the OTGA will change training from a "north to south" culture to north-south, south-south, and south-north model, namely by promoting the expertise already available in many developing regions (e.g. promoting the use of local experts as lecturers and training assistants by the Regional Training Centres). OTGA will (i) promote the establishment of at least 5 Regional Training Centres as well as their close collaboration through advanced information technology, in, inter alia, Europe, Africa (IOC-Africa²⁶), Latin America & Caribbean (IOCARIBE²⁷), Indian Ocean (IOCINDIO²⁸) and Western Pacific (IOC-WESTPAC²⁹); and (ii) further develop the OceanTeacher Learning System in order to become an overarching Capacity Development (CD) platform covering multiple IOC (and associate) programmes. All the aforementioned will lead to the following benefits: (i) increase the annual number of trainees that can participate in OceanTeacher Academy courses; (ii) increase the availability/involvement and the level of expertise of trainers; (iii) alleviate the costs and other drawbacks of long-distance traveling by trainers / lecturers and trainees; (iv) increase the focus on local issues while keeping a global perspective; and (v) increase self-driven capacity development, including local training expertise.

7.1.3 Mr Jeff Wilson (WMO) then provided an overview of **WMO's capacity development programme**. The Group noted that the WMO Capacity Development Strategy (CDS) and its

22 <http://www.oceanteacher.org>

23 International Coastal Atlas Network Project

24 IOC Harmful Algal Bloom Programme

25 Integrated Coastal Area Management

26 IOC-UNESCO Sub-Commission for Africa and the Adjacent Island States

27 UNESCO IOC Sub-Commission for the Caribbean and Adjacent Regions

28 IOC Regional Committee for the Central Indian Ocean

29 IOC Sub-Commission for the Western Pacific

Implementation Plan (CDSIO) 2012-2015 were approved at the 64th and 65th Executive Councils in 2012 and 2013, respectively³⁰. Through its Education and Training Programme, WMO assists the National Meteorological and Hydrological Services, especially those of developing countries, in their efforts to contribute, in the most effective manner, to the development plans of their countries and to become full partners in global collaborative efforts. Its focused efforts were made to the development of human resources through training, provision of educational material, the award of fellowships, and supporting Regional Training Centers of WMO. Training activities are coordinated by subject, such as meteorology (including marine meteorology and tropical meteorology), weather forecasting, agriculture, aviation, climate and climate prediction, disaster prevention, environment, hydrology, instruments (including satellite and radar remote-sensing) and observations, oceanography, telecommunications, and many others. There are 26 Regional Training Centres and a network of cooperating universities and advanced training institutions, which contribute to the global effort. WMO promotes and facilitates technology transfer, as well as the establishment and development of specialized centres of excellence in various regions. It has established Regional Offices at Headquarters in Geneva and field offices in various parts of the world, which enable the Organization to effectively assist countries in their quest for sustainable development.

7.2 JCOMM Data Management Training requirements

7.2.1 In light of the discussions under agenda item 7.1 above, the Group discussed the JCOMM Data Management Training requirements. Mr Reed noted that the primary objective of JCOMM Capacity Development is to enhance the implementation of the overall JCOMM Programme through enhancing capacity in all Members/Member States to contribute to and benefit from the programme. Specific JCOMM-focused CB activities are implemented by the respective Programme Areas (PAs) and included in their respective workplans. At JCOMM-4 in May 2012, it was decided to make further efforts for the following types of activities: (i) preparation and management of technical guidance materials, in conjunction with the regular review and update of the Guides and Manuals; (ii) strengthened liaison and contacts with wider WMO-IOC capacity development programmes, particularly for the application of developed marine meteorological and oceanographic training material and for the development of training programmes - for example, OceanTeacher²² developed by the IODE of UNESCO/IOC, and the courses sponsored through the WMO Education and Training Programme (ETRP); (iii) development of a web-based tool to document/consolidate/visualize overall Capacity Development activities of the Commission, particularly those initiated and directly supported by the Members / Member States. Partnerships among distance learning programmes, such as USA's University Corporation for Atmospheric Research (UCAR) COMET Program³¹ are strongly encouraged; (iv) enhanced support for time-bound projects with clear objectives and plans for delivery, which serve for Members'/Member States' capacity development and technology transfer needs, with a view to leveraging other potential funding sources and responding to expressed priorities of Members / Member States; and (v) enhanced collaboration through the Partnership for New GEOSS Applications (PANGEA), a concept developed by JCOMM with the goal to develop resource-sharing partnerships to realize the socio-economic benefits of ocean observing systems at global and regional scales.

7.2.2 The Group recalled the ongoing development within JCOMM of a minimum baseline standard of competence considered necessary to perform the duties of a marine weather forecaster (MWF), in line with the WMO's effort for quality management approaches (see agenda item 6.1), which is closely linked to the amendment of WMO Technical Regulations as well as the requirements for training of professionals.

7.2.3 Mr Reed stressed that capacity building/development is a high priority for both WMO and IOC, as well as for JCOMM. IOC/IODE and its OceanTeacher have collaborated in the past with JCOMM and WMO through several joint training activities. These series of international and regional seminars and workshops were very successful in achieving its purpose, and corresponded well with national and regional requirements. The (WMO) Commission, in particular, acknowledged that cooperation with the International Oceanographic Data and Information Exchange (IODE) and

³⁰ <http://www.wmo.int/pages/prog/dra/CDS.html>

³¹ <http://www.met.ed.ucar.edu/>

its Project Office in Ostend, Belgium, had been particularly beneficial in stimulating capacity development activities, and agreed that such collaboration should continue and be strengthened. It has been noted, however, that there is still a strong need for more of these joint training activities and requests for more active collaboration have been made. Mr Reed referred to the recently approved IOC Strategic Plan for Oceanographic Data and Information Exchange (2013-2016) that recommends the continued development of Ocean Data and Information Networks (ODINs) backed up by OceanTeacher as a capacity building tool, whilst extending OceanTeacher through cooperation with JCOMM and others as appropriate (see paragraph 357 of the IODE-XXII summary report).

7.2.4 Referring to JCOMM-4 he further recalled that the following activities were requested to be developed: (i) continue capacity development activities, including training workshops, that will assist developing countries to better use ocean products and to participate more fully in the global observing effort; (ii) encourage identification and implementation of observing standards and best practices, with particular focus on developing countries, including through encouraging JCOMM members to offer new Regional Marine Instrumentation Centre (RMIC) facilities; and (iii) continue to document institutional data and metadata management practices for each component of the observing system to advance consistent, climate-quality, seamless data delivery both in near real time and delayed mode. More specifically, the (JCOMM) Commission agreed that the following series of training workshops, and new initiatives as deemed appropriate to address the need of Members/Member States, should be continued in parallel with an effort to streamline their programmes and curricula:

- (i) training courses on the Ocean Data Portal (ODP);
- (ii) training courses on ocean and marine meteorology data management, including cross-discipline introductory courses;
- (iii) workshops for Port Meteorological Officers (PMOs);
- (iv) workshops on marine instrumentation and deployment through RMICs;
- (v) training workshops on ocean observations and modeling;
- (vi) JCOMM-TCP Training workshops on storm surge and wave forecasting;
- (vii) Training workshops on application of satellite products to marine forecasting;
- (viii) training workshops on sea ice analysis; and
- (ix) workshops on maritime safety services and marine service quality management.

7.2.5 Looking towards the future Mr Reed observed that some of the assets for IOC-IODE/WMO collaboration are the fact that both WMO and the IODE OceanTeacher Academy already use Moodle as a LMS (Learning Management System) and both operate or are in the process to operate through a network of Regional Training Centres (RTC's). Notably, in its 4th Session, the JCOMM Commission particularly welcomed the OceanTeacher Global Classroom (later renamed to OceanTeacher Global Academy – OTGA) initiative, being developed by IODE, which allows training courses to take place simultaneously in multiple locations through the use of video conferencing technology. It recalled that a similar type of virtual training was conducted also at the WMO High Profile Training Event (HPT) in 2006, and noted that such an initiative would increase the number of students per course while reducing travel cost. Furthermore, the Commission requested the Secretariats and Programme Area Coordinators to use the OceanTeacher Global Academy as much as possible for JCOMM training courses. Finally, The Commission noted with appreciation that both UNESCO/IOC and WMO had made continued efforts to facilitate access to a wide range of training materials through OceanTeacher²² developed by the IODE of UNESCO/IOC, and the WMO ETRP Moodle platform³². It strongly recommended that these efforts should be closely coordinated, and that the developed material should be used to the maximum extent possible to enhance the efficiency of the various hands-on trainings and workshops as common/standard curricula and preparatory material. The Commission also encouraged its Members/Member States to actively coordinate with WMO and UNESCO/IOC to develop partnerships among distance learning programmes, such as USA's UCAR/COMET Program³¹.

32 <http://etrp.wmo.int/moodle/>

7.2.6 The meeting made the following recommendations:

- (i) **Rec. 1:** The Group recommends that WMO and IOC/IODE consider the future collaboration of the planned OceanTeacher Global Academy Regional Training Centres and WMO's Regional Training Centres as well as the network of cooperating universities and advanced training institutions, which contribute to the global effort, in order to address the training needs of Members/Member States within the framework of JCOMM;
- (ii) **Rec. 2:** The Group recommends that WMO and IOC/IODE investigate the complementarity of the OceanTeacher , ETRP co-sponsored courses and COMET systems in order to facilitate sharing of content across these systems;
- (iii) **Rec. 3 :** The Group recommends that WMO and IOC/IODE/OceanTeacher jointly undertake the organization and funding of the following courses as requested by JCOMM-4 : (i) training courses on the Ocean Data Portal (ODP); (ii) training courses on ocean and marine meteorology data management, including cross-discipline introductory courses; (iii) workshops for Port Meteorological Officers (PMOs); (iv) workshops on marine instrumentation and deployment through RMICs; (v) training workshops on ocean observations and modeling; (vi) JCOMM-TCP³³ Training workshops on storm surge and wave forecasting; (vii) Training workshops on application of satellite products to marine forecasting; (viii) training workshops on sea ice analysis; and (ix) workshops on maritime safety services and marine service quality management

7.2.7 The meeting decided to establish a joint IOC-WMO working group on JCOMM capacity building activities. This Group will be responsible to coordinate the actions recommended under 7.2.6 above (**action; IOC, WMO Secretariats; March 2014**).

7.2.8 The Group was informed that DBCP is planning at least one course in 2014. The Group recommended that this opportunity should be used to create the content in OTA. It was recommended further that the designated lecturers contact Dr Claudia Delgado at the IOC Project Office for IODE, Oostende so the necessary preparations can be made including creation of a course outline in Moodle, assistance with content uploading etc. It was noted that using the OTA platform allows the re-use of materials, provides promotion for the course and lecturers (lecturers can obtain statistics on the visits to the course) and also allows the students to re-visit the course content. The Group requested the WMO Secretariat to invite the DBCP to consider these recommendations (**action; WMO Secretariat; ASAP**).

7.2.9 The Group was informed that for several RMIC/AP courses organized in China, the training materials (including video recordings) are available and could be migrated to OceanTeacher. The Group recommended that this be further investigated, and requested the IODE Secretariat to contact the RMIC/AP via Ms Shaohua LIN (China) to that extend (**action; IODE Secretariat; ASAP**).

7.2.10 The Group was informed that there is an IODE Steering Group for OceanTeacher. It was noted that in addition to "courses" there is also pre-course and post-course work for the students. There will also be some attention given to individual e-learning to expand the audience reached and also webinars are considered. WMO is considering making its learning materials available through WIS. The Group recommended that OceanTeacher make its course materials available in similar way. In this regard, it was recommended to investigate ways to discover training materials on the Internet. Google was mentioned as a potential partner. (**action; IODE Secretariat, WMO Secretariat; as soon as possible**)

33 Tropical Cyclone Programme

7.2.11 The meeting was then addressed by Mr Steve Foreman (WMO) on WIS training and competencies. A workshop was organized in October 2013 that focused on identifying essential competencies: what must people be able to do. The following competence areas were identified infrastructure (managing physical infrastructure, operational applications), data (managing the data flow, data discovery), external interactions (managing WIS centre-centre interaction) and operational service. A WIS training and learning guide was prepared for each of these competence areas: for each competence there is a description, learning outcomes, what you will learn, learning activities, assessment and resources. An example is available through the WMO website³⁴. The Group welcomed cooperation between OceanTeacher and WMO WIS. The meeting agreed that JCOMM should develop a document listing the competency requirements for ocean data management, together with associated training materials (or references to such existing materials). The Group requested the DMCG Chair to coordinate this action during the intersessional period (**action; S. Iona; 2017**).

8. COLLABORATIONS

8.1 WMO

8.1.1 WMO Information System (WIS)

8.1.1.1 Status of WIS, including status of JCOMM related Data Collection and Production Centres (DCPCs)

8.1.1.1.1 The Secretariat reported on the status of the WMO Information System (WIS³⁵). The Group noted that Fifteen Global Information System Centres (GISCs) are recorded in WMO-No 1060 *The Manual on the WMO Information System*. Of these eight are fully operational. The Manual on WIS also lists 75 Data Collection or Production Centres (DCPCs) and 223 National Centres (NCs). Nine centres associated with JCOMM are registered (Germany, Croatia, UK, USA, Russia, Australia, Italy, and Qatar). Of these, four are fully operational (Germany, 2 in the UK, and Australia), one is ready for formal recognition through a change to the Manual on WIS (Croatia), two are providing an operational service but need to complete the WIS registration process (USA, and Russia), and two are under development (Italy, and Qatar).

8.1.1.1.2 Mr Foreman then briefly discussed code lists. Reference was made to <http://codes.wmo.int>. Code lists can be referred to unambiguously. Example: <http://codes.wmo.int/bufr4/b/12>.

8.1.1.2.3 The Group was informed about SeaVox. SeaVox is a combined SeaDataNet and MarineXML Vocabulary Content Governance Group. It has been set up, moderated by BODC. The Group recommended that the activities on developing and updating code lists should be coordinated between the WMO and IOC for JCOMM related code lists through SeaVox so that appropriate WMO groups should be included in the SeaVox discussions. The Group requested Ms Iona to contact Roy Lowry of BODC to address the issue and suggest people to be included in the discussions and SeaVox Governance Group (**action; S. Iona; ASAP**).

8.1.1.2 Interoperability of WIS with the IODE Ocean Data Portal (ODP)

8.1.1.2.1 The IODE Ocean Data Portal (ODP) (see agenda item 5.4) provides an interface for users to query the contents of the WMO Information System (WIS) metadata catalogue. To achieve this, the ODP imported the WIS catalogue from one of the WIS GISC. The Group noted that there are two approaches that could be used to ensure that those searching the ODP received records from the current WIS metadata catalogue:

³⁴ <http://wis.wmo.int/doc=2741>

³⁵ <http://www.wmo.int/wis>

1. The first is to regularly harvest the WIS catalogue using a protocol that only provides updated records (the GISCs use OAI-PMH³⁶ to synchronize their own catalogues).
2. The alternative is for the ODP to use SRU³⁷ search to query the WIS catalogue whenever a user performs a search.

8.1.1.2.2 Dr Belov informed the Group that ODP currently uses option 1 through the German GISC at DOD. The WIS is harvested once a day. Regarding the second option he stated that this can also be implemented.

8.1.1.2.3 The same two techniques could be used to provide visibility of metadata records in the ODP through the WIS. The Data Management Coordination Group recommended that the team managing the ODP should investigate which is the preferable option between (i) using a search interface to allow users to search the ODP and WIS catalogues, and (ii) each of the ODP and WIS harvesting the metadata records of the other.

8.1.2 Migration to Table Driven Codes

8.1.2.1 The leader of the JCOMM Task Team on Table Driven Codes (TT-TDC), Dr David Berry, reported on the migration to table drive codes and the representation of the TT-TDC and JCOMM at the First Meeting of the Commission for Basic Systems (CBS) Inter Programme Expert Team on Data Representation Maintenance and Monitoring (IPET-DRMM), 1 – 5th July 2013, Tokyo, Japan. A number of proposals were made to the IPET-DRMM, including the ENCODE³ proposal for the masking of Voluntary Observing Ship (VOS) callsigns and new BUFR templates for moored buoy, drifting buoy and temperature, salinity and current profile (CTD) data. These were all accepted for validation. A number of other proposals, relating to the preservation of the data as reported by VOS (i.e. the plain text string as transmitted ship to shore), were not accepted.

8.1.2.2 Dr Berry then briefly described the validation process for the proposed templates and the results of the validation for the accepted proposals. The WMO requirement for validation of the changes consisted of testing the proposed BUFR templates and changes to the manual on codes using 2 different encoders and decoders and the reporting back of this testing to the IPET-DRMM. This was done successfully within the TT-TDC for the moored buoy, drifting buoy and CTD templates. Dr Berry reported that these templates should become operational on May 2014. Whilst the modified VOS template was accepted for validation, a number of other proposed changes that this depended on were not accepted. As a result, the validation of the modified VOS template, including the ENCODE³ proposal has been delayed, but this extra functionality is not required for migration.

8.1.2.3 The Group concurred with the security requirements proposed by the TT-TDC, and approved by the JCOMM Co-President (**Annex VI**). The Group also agreed with the proposed priorities of TT-TDC for the next 12 months (**Annex VII**).

8.1.2.4 For the longer term, the Group invited the TT-TDC to work on defining BUFR common sequences for specific marine meteorological and oceanographic variables (**action; TT-TDC; 2017**).

8.1.2.5 The Group thanked Dr Berry and the Task Team for his efforts to make substantial progress with regard to migration to Table Driven Codes.

8.2 IOC

8.2.1 Ocean Biogeographic Information System (OBIS)

³⁶ Open Archives Initiative Protocol for Metadata Harvesting

³⁷ Search/Retrieve via URL

8.2.1.1. This agenda item was introduced by Mr Ward Appeltans (IOC Secretariat) via Webex. He recalled that the Ocean Biogeographic Information System (OBIS) of IODE (<http://www.iobis.org>) is a global alliance that collaborates with scientific communities to facilitate free and open access to, and application of, biodiversity and biogeographic data and information on marine life. Holding currently over 37 million records of 121,000 marine species, OBIS provides access to the largest, global, integrated marine biogeographic database.

8.2.1.2. One of OBIS's objectives is to contribute to a concerted global approach to marine biodiversity and ecosystem monitoring through providing guidelines on standards and best practices on marine biodiversity data, including globally agreed Essential Climate Variables (ECVs), observing plans, and indicators in collaboration with other IOC programmes, such as the Global Ocean Observing System (GOOS).

8.2.1.3. GOOS is in the process of developing a framework for biological and biogeochemical ocean observing systems. A GOOS biology expert panel will be established to steer this process, subject to the identification of extra-budgetary resources to sustainably support this activity. IODE/OBIS has been invited to be part of the biology group. Mr Ward Appeltans (OBIS project manager) attended the first GOOS biology meeting on 13-15 November 2013 in Townsville (Australia). Data and information systems are a key component of the GOOS global framework for biological ocean observing systems and IODE/OBIS will contribute to this by playing a role in providing data infrastructure and guidelines and best practices in marine biodiversity data management.

8.2.1.4. While OBIS typically provides data in delayed mode, there are several OBIS nodes that start delivering data in near-real time mode due to the implementation of new technologies in species tracking, including passive acoustic monitoring, ship and aerial line-transect surveys, animal telemetry, and photo-identification (e.g., Continuous Plankton Recorder).

8.2.1.5. IODE/OBIS also contributes to the Global Earth Observing System of Systems (GEOSS) by hosting the data, web site, and value added products of the Ocean component of the European Commission funded GEO Weather, Ocean and Water (GEOWOW) project, and by providing data for developing indicators of the impact of ocean acidification on marine biodiversity (e.g. pteropods in polar regions). OBIS is also a member of the GEO Biodiversity Observation Network (BON) and takes active part of two working groups ("marine ecosystem change" and "data integration and interoperability"). OBIS was also approved as a data core component/resource of GEOSS on 6 March 2013.

8.2.1.6 The Group noted that while biogeographic data do not appear to fall within the scope of JCOMM today, the move towards real-time mode and the growing involvement of OBIS in GOOS may soon make OBIS quite relevant to JCOMM, especially when taking into account the high relevance of marine biodiversity to climate change and biogeochemical research (including primary productivity and the carbon and nutrient cycle) and the impact of climate change on marine biodiversity and biogeography.

8.2.2 GOOS: EuroGOOS and other GRAs

8.2.2.1. The Group was informed by Dr Sergey Belov that IODE/ODP is currently working with GOOS to serve metadata and data through the ODP. EuroGOOS has been providing coordination support with the GOOS GRAs and has provided an inventory of candidate resources to be enabled through the ODP. Enabling access to these resources is currently underway with a significant number of datasets to be available in February 2014.

8.2.2.2. GEOWOW intends to contribute to the ODP and currently expects to be live by the summer of 2014. Planning discussions will continue to take place with the intent of enabling access to GEOWOW data, geospatial services, and metadata by the end of 2014. GEOWOW has 8 work packages of which WP8 deals with liaising the project achievements with the external world - policy-makers, interest groups, media and the public at large as well as the main GEOSS bodies,

8.2.2.3. Through its participation in prototype development within the Ocean Data Interoperability Platform (ODIP), the ODP team which includes Partnership Centre for the IODE Ocean Data Portal (ODP), ODP Project Manager (Mr. Tobias Spears) and IOC Project Office for IODE will become more familiar with the GEOSS Common Broker technology and will work towards the delivery of metadata and data between the ODP and GEOSS. This work also represents an opportunity to enhance the ODP interoperability package.

8.2.2.4. The membership of the Steering Group for the IODE/ODP will be re-evaluated according to the revised Terms of Reference and extended to include representation from GOOS and other key node providers and programs. Collaboration between IODE/ODP, node providers, and complementary programs is critical to ensuring the ongoing advancement of the IODE/ODP technical architecture, expansion of resources accessible through the IODE/ODP, and ongoing commitment to enabling access to stakeholder metadata and data.

9. DATA MANAGEMENT IMPLEMENTATION PLAN

9.1 Review of content and actions

9.1.1 The Group recalled that JCOMM-4 requested the DMPA to keep the Data Management Plan³⁸ and its implementation details³⁹ under review, and to update them as needed. The Group agreed both documents should be updated according to JCOMM-4 and IODE-22 recommendations. The Group therefore reviewed these documents and updated them, and tasked Group members to update specific sections of the documents. The Group also reviewed progress on the implementation details (version 5) of the Plan. Tasks and future actions for the realization of the Plan and its objectives were also discussed in order to be able to propose a further updated version of the plan.

9.1.2 The Group requested its members provide their assigned review of the Data Management Plan and Implementation Details to the Secretariat for consolidation purposes (**action; DMCG members; 28 Feb. 2014**). The Group further requested the Secretariat to then provide consolidated copies of these documents to the DMCG Chair (**action; Secretariat; 15 Mar. 2014**).

9.1.3 The Group agreed that the next update of the Data Management Plan and its Implementation Details should be made publicly available within 10 months and requested S. Iona to lead this effort in liaison with the Secretariat, and with input from Group members (**action; S. Iona; Sept. 2014**).

9.2 Cookbook for Submitting Data, present status and future actions

9.2.1 The Group was briefed on the present status of the Oceanographer's Cookbook for submitting ocean data in real-time and delayed mode⁴⁰. The Group recalled that the purpose of this document is to provide a practical resource to those who collect oceanographic and marine meteorological data to facilitate contribution of the data to the international community. The focus is on *in situ*, directly observed measurements, rather than on remote sensing data (e.g. from satellites). The approach taken in writing the Cookbook is to provide several brief, informative primers on the data types covered in the document, example activities that use the data, and then on the pathways and protocols for submitting data, both in real time and in delayed mode. These primers are followed by "cookbooks" that provide the detailed procedures to provide data.

38 JCOMM TR No. 40, Rev. 1 dated 12 February 2012. Background information on the Data Management Plan and its implementation details together with links to most current versions of both documents can be found on the JCOMM website at :
<http://www.jcomm.info/DMPPlan>

39 <http://www.jcomm.info/dmp-id>

40 <http://www.jcomm.info/data-cookbook>

9.2.2 The Group agreed that the documents should be maintained electronically with additions made as required. The intent is to have frequent refreshes and additions to the recipes as users provide feedback and additional inputs. The Group agreed that the DBCP Technical Coordinator should act as a focal point for updating the Cookbook, and collect input from various data sources. The Group and invited its members to submit comments through support@jcommops.org (**action; DMCG members; ongoing**). The Group invited the DBCP Technical Coordinator to finalize the first version of the document, to post it on the JCOMM website, as well as chapters on the OceanTeacher, and to broadly advertise it via JCOMM and IODE (e.g. 1-page flyer to be distributed to participants of JCOMM meetings) (**action; TC DBCP; Mid. 2014**).

10. WORK PLAN FOR 2013-2016 AND REVIEW OF ACTIONS ITEMS FROM THE MEETING

10.1. The Group reviewed action items arising from the Session, and updated its work plan for the intersessional period 2014-2017. The updated workplan is reproduced in **Annex IV**. The agreed upon action items arising from the Session are listed in **Annex III**.

11. CLOSURE OF THE MEETING

11.1 Ms Sissy Iona thanked all for participating and for their comments and support to the DMCG, as well as the Secretariat. She stressed that there is still a substantial amount of work to be completed before the Fifth session of JCOMM in 2017, especially by the two Expert Teams on Marine Climatology (ETMC) and Data Management Practices (ETDMP). The Group thanked the WMO Secretariat for the great facilities and support provided during the Session.

11.2 The Fifth Session of the JCOMM Data Management Coordination Group (DMCG-5) closed at 16h00 on Friday 31 January 2014.

ANNEX I

AGENDA

- 1. ORGANIZATION OF THE SESSION**
 - 1.1 Opening
 - 1.2 Adoption of the agenda
 - 1.3 Local arrangements
- 2. DMPA CHAIRPERSON'S REPORT**
- 3. REVIEW OF PRIORITY ACTIVITIES AND GUIDANCE FROM JCOMM-4**
- 4. ETMC ACTIVITIES**
 - 4.1 Chairperson's report
 - 4.2 MCDS Development
 - 4.3 CLIMAR-4
 - 4.4 Sea-ice and wave climatologies
 - 4.5 Link with CCI
- 5. ETDMP ACTIVITIES**
 - 5.1 Chairperson's report
 - 5.2 Ocean Data standards, and best practices
 - 5.3 Metadata Management
 - 5.4 Ocean Data Portal
- 6. QUALITY MANAGEMENT**
 - 6.1 WMO Quality Management Framework (QMF)
 - 6.2 IODE quality Management Framework
- 7. CAPACITY BUILDING ACTIVITIES**
 - 7.1 Cooperation between WMO Education and Training Programme and the IODE OceanTeacher Global Academy
 - 7.2 JCOMM Data Management Training requirements
- 8. COLLABORATIONS**
 - 8.1 WMO
 - 8.1.1 WMO Information System
 - 8.1.2 Migration to Table Driven Codes
 - 8.2 IOC
 - 8.2.1 OBIS
 - 8.2.2 GOOS: EuroGOOS and other GRAs
- 9. DATA MANAGEMENT IMPLEMENTATION PLAN**
 - 9.1 Review of content and actions
 - 9.2 Cookbook for Submitting Data, present status and future actions
- 10. WORK PLAN FOR 2013-2016 AND REVIEW OF ACTIONS ITEMS FROM THE MEETING**
- 11. CLOSURE OF THE MEETING**

ANNEX II

PARTICIPANTS LIST

FIFTH SESSION OF THE DATA MANAGEMENT COORDINATION GROUP (DMCG-5)
(Geneva, Switzerland, 29 – 31 January 2014)

DMCG MEMBERS

Dr Sergey BELOV
head of laboratory
6, Korolev St
Obninsk
Kaluga Region
Russian Federation
249035
Tel: +7 48439 74194
Fax: +7 499 795 22 25
Email: belov@meteo.ru

Dr David BERRY
Senior Research Assistant
National Oceanography Centre,
Southampton
National Oceanography Centre
European Way
Southampton
SO14 3ZH
United Kingdom
Tel: +44-23 8059 7740
Fax: +44-23 8059 6400
Email: dyb@noc.ac.uk

Sissy IONA
Head HNODC
Hellenic Centre for Marine Research
(HCMR), Hellenic National Oceanographic
Data Centre (HNODC)
46.7 Km, Athens-Sounio Ave.
PO BOX 712 Anavyssos
190 13 Anavyssos, Attica
Greece
Tel: +30-22910-76367
Fax: +30-22910-76347
Email: sissy@hnodc.hcmr.gr

Mr Martin KRAMP
Ship Coordinator
JCOMM in situ Observing Program Support
Centre, JCOMMOPS
8-10, rue Hermès
Parc Technologique du Canal
31526 Ramonville
France
Tel: +33 2 98 05 77 80
Fax: +33 2 98 05 76 90
Email: mkramp@jcommops.org

Prof Shao Hua LIN
Director Honorary
National Marine Data and Information Service
No. 93, Liuwei Road
300171 Tainjin
Hedong District
China
Tel: +86 22 2401 0803
Fax: +86 22 240 10926/ +86-22-24010820
Email: hslin@mail.nmdis.gov.cn

Mr Greg REED
Executive Officer
Australian Ocean Data Centre Joint Facility
Fleet Headquarters
Wylde Street Building 89
Garden Island Potts Point NSW 2011
Australia
Tel: +61 2 9359 3141
Fax: +61 2 9359 3120
Email: greg@metoc.gov.au

Ms Gudrun ROSENHAGEN
Deutscher Wetterdienst
Bernhard-Nocht-Strasse 76
20359 HAMBURG
Germany
Tel: +49 69 8062 6259
Fax: +49 69 8062 6209
Email: gudrun.rosenhagen@dwd.de

Lic. Ariel TROISI
Head Oceanography
Servicio de Hidrografia Naval
Av. Montes de Oca 2124
C1270ABV Buenos Aires
Argentina
Tel: +54 11 4301 3091
Fax: +54 11 4301 3091
Email: ahtroisi@gmail.com

WMO SECRETARIAT

*World Meteorological Organization
Observing and Information Systems
Department
Observing Systems Division
World Meteorological Organization
7bis, av. de la Paix
Case Postale 2300
1211 Genève 2
Switzerland*

Dr Omar BADDOUR
Chief, Data Management Applications
Division
WMO Information System Branch (WIS
Branch)
Observing and Information Systems
Department
Tel: +41 22 730 8268
Email: obaddour@wmo.int

Mr Edgard CABRERA
Chief, Marine Meteorology and Ocean Affairs
Division
Weather and Disaster Risk Reduction
Services Department
Tel: +41 22 730 8237
Email: ecabrera@wmo.int

Mr Etienne CHARPENTIER
Head, Marine and Ocean Meteorological
Observations and Data Management Unit
Observing and Information Systems
Department
Observing Systems Division
Tel: +41 22 730 8223
Email: ECharpentier@wmo.int

Ms Karolin Eichler
Data Management Applications Division
WMO Information System Branch (WIS
Branch)
Observing and Information Systems
Department
Tel: +41 22 730 8527
Email: keichler@wmo.int

Mr Steve FOREMAN
Chief, Data Representation, Metadata and
Monitoring
WMO Information System Branch (WIS
Branch)
Observing and Information Systems
Department
Tel: +41 22 730 8171
Email: SForeman@wmo.int

Dr Boram LEE
Scientific Officer
Marine Meteorology and Ocean Affairs
Division
Weather and Disaster Risk Reduction
Services Department
Tel: +41 22 730 8273
Email: BLee@wmo.int

Dr Miroslav ONDRAS
Chief, Observing Systems Division
Observing and Information Systems
Department
Tel: +41 22 730 8409
Email: mondras@wmo.int

Dr Peiliang SHI
Director, WMO Information System Branch
(WIS Branch)
Observing and Information Systems
Department
Tel : +41 22 730 8219
Email: PShi@wmo.int

Mr Atsushi SHIMAZAKI
Scientific Officer
Data Representation, Metadata and
Monitoring
WMO Information System Branch (WIS
Branch)
Observing and Information Systems
Department
Tel : +41 22 730 8313
Email: ashimazaki@wmo.int

Mr David THOMAS
Chief, Information and Telecommunication
System Division
WMO Information System Branch (WIS
Branch)
Observing and Information Systems
Department
Tel: +41 22 730 8241
Email: dthomas@wmo.int

Dr Wenjian ZHANG
Director, Observing and Information Systems
Department
Tel: +41 22 730 8567
Fax: +41 22 730 8128
Email: wzhang@wmo.int

IOC SECRETARIAT

Mr Peter PISSIERSSSENS
Head, IOC Project Office for IODE,
Oostende, Belgium
UNESCO/IOC Project Office for IODE
Wandelaarkaai 7 - Pakhuis 61
B-8400 Oostende
Belgium
Tel: +32-59-340158
Fax: +32-59-79 5220
Email: p.pissierssens@unesco.org

**JCOMM OBSERVATIONS PROGRAMME
AREA**

Ms Candyce CLARK
JCOMM Observations Programme Area
(OPA) Coordinator
National Oceanic and Atmospheric
Administration
NOAA/Climate Program Office
Climate Observation Division
1100 Wayne Avenue, suite 1202
Silver Spring MD 20910
United States
Tel: +1 301 427 2463
Fax: +1 301 427 0033

ANNEX III

ACTION ITEMS FROM THE DMCG-5 SESSION

No.	Ref.	Action item	By	Deadline
1	2.6. (i)	To complete the first step of the DMCG evaluation of China's CMOC application, and define next steps in this regard	DMCG members	Done
2	2.6. (ii)	To update the MCDS-IP taking into account the IODE <i>ad hoc</i> team comments	TT-MCDS & ETMC	March 2014
3	2.6. (iii)	To investigate how interoperability of ocean data systems with the WIS can be promoted, and include such requirements in the JCOMM Data Management Plan	DMCG members	Done
4	2.6. (iv)	To take into account the forthcoming WMO 17 th Congress (2015) and IOC Assembly (2015) in order to provide high level JCOMM guidance on DMPA related activities to these WMO and IOC governing bodies. The DMPA dashboard should be updated accordingly	S. Iona	ASAP
5	3.6	To follow up on the actions proposed by the Management Committee	DMCG Chair, ETMC Chair, & ETDMP Chair	asap
6	3.10	To review the draft document on the assessment of the current real-time data streams from the OCG networks and to submit comments directly to OPA Coordinator, Candyce Clark	DMCG members & IODE	Mid. 2014
7	3.13	To investigate and propose a representative of WIS in the TT-IOSSW	WMO Secretariat (S. Foreman)	28 Feb. 2014
8	4.2.4	To clarify its CMOC proposal	L. Shaohua	28 Feb. 2014
9	4.2.5	To make sure that the ICOADS Steering Committee Terms of Reference are defined in such a way that the ICOADS is meant to become a CMOC	ICOADS partnership	ASAP
10	4.2.6	To approach EMODNet to investigate the opportunity for EMODNet to offer the functions of a CMOC, which relevant parts could eventually be established as such	S. Iona	ASAP
11	4.2.7	To write to Members/Member States already participating in the MCSS, and/or running DACs/GDACs to invite them to consider submitting applications for MCDS DACs and GDACs, and to provide enough detail so that their application can be evaluated against the agreed criteria	Secretariat	ASAP
12	4.2.8	To update the MCDS webpages with the latest information, in particular with regard to the CMOCs role, the link with the IODE, and communicating the benefits of the MCDS	Secretariat	ASAP
13	4.3.3	To organize an informal meeting of the ETMC and Task Team on MCDS on side of CLIMAR-4	G. Rosenhagen	June 2014
14	4.4.1	To approach the ETSI Chair in the view to develop a workplan so that Sea-ice climatologies could be included in the products eventually delivered through the future CMOCs	G. Rosenhagen	ASAP

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No.	Ref.	Action item	By	Deadline
15	4.4.1	ETMC to be represented at the ETSI-5 meeting even through teleconference	G. Rosenhagen	Mar. 2014
16	4.4.3	To continue the collaboration with the ETWCH regarding pilot activities to scan existing databases that contain comprehensive records of wave observations (e.g. OGP ¹ , GlobWave altimeter data base), to include related climatologies into the ICOADS, and to report on progress to the DMCG Chair before the next JCOMM Management Committee meeting	G. Rosenhagen	Sept. 2014
17	4.4.4	To discuss possible production of wave monthly summaries (e.g. using the wave data from ships and buoys in ICOADS) with the ICOADS in the view to speed up the process	ETMC	ASAP
18	4.4.5	To collaborate with the ETMC in developing the plan for a storm surge climatology, noting that Scott Woodruff has been designated by the ETMC as contact point in this regard	ETWCH	ASAP
19	4.5.11	To continue the discussion with the CCI Experts and to use the chance of intensifying the contact at the 16 th session of CCI, which is going to take place in Heidelberg, Germany in early July 2014	G. Rosenhagen	15 May 2014
20	4.5.12	To propose information and recommendations for the forthcoming CCI Session through the DMPA Coordinator, and the DMPA Coordinator to agree with the ETMC Chair on what information and recommendation to actually submit to the CCI	DMCG members & DMCG & ETMC Chairs	15 May 2014
21	5.1.7	To investigate finding a replacement for Richard Crout (USA) in the ETDMP membership	WMO Secretariat	asap
22	5.1.8	To contact Brazil and find a replacement for Mr Paulo Polito (Brazil) who does not seem to take an active role in the activities of the ETDMP	IOC Secretariat	ASAP
23	5.2.2 (i) & (ii)	To update the Data Management Plan and its Implementation Details (see agenda item 9)	S. Belov	ASAP
24	5.2.2 (iii)	To encourage, by preparing and distributing an invitation for submissions, experts in respective communities to propose standards and best practices to be submitted to the ODSBP	IOC Secretariat	ASAP
25	5.2.2 (iv)	To publicize adopted standards and best practices in respective communities in order to promote their usage	IOC Secretariat	ongoing
26	5.2.3	To invite the Management Committee to give its formal agreement for JCOMM to join the Ocean Data Standards and Best Practices Project	DMCG Chair	MAN-11
27	5.3.2 (i)	To continue to review and compare specific vocabularies and code lists used in other projects, programmes and initiatives such as the WIS, and the Ocean Data Interoperability Platform (ODIP)	ETDMP	end 2014
28	5.3.2 (ii)	To recommend standards and best practices for used vocabularies and code lists;	ETDMP	end 2014
29	5.3.2 (iii)	To consider a creation of knowledgebase service that will inform users about existing controlled vocabularies and similar authority systems	ETDMP	end 2014
30	5.3.5	To collaborate with the JCOMM DMPA Task Team on table driven codes (TT-TDC)	ETDMP TT-	2 nd quarter 2014

1 International Association of Oil and Gas Producers (OGP) Metocean Committee

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No.	Ref.	Action item	By	Deadline
			metadata	
31	5.4.5 (i)	To continue to liaise and collaborate with external group of experts from different projects, programmes and initiatives (i.e. WIS, GEOSS, GOOS, ODIP, etc) in order to establish interoperability and data/services accessibility;	ETDMP & TT-ODP	end 2014
32	5.4.5 (ii)	To assess the deployment of the ODP nodes with assistance of the Partnership Centre for IODE ODP;	ETDMP & TT-ODP	end 2014
33	5.4.5 (iii)	To ensure implementation of standards and best practices published via ODSBP;	ETDMP & TT-ODP	end 2014
34	5.4.5 (iv)	To indentify and recommend standards and best practices to be proposed to the OBSBP.	ETDMP & TT-ODP	end 2014
35	5.4.6	To invite the IOC Sub-Commission for WESTPAC to consider the possibility to establish an ODP node for the WESTPAC region	IOC Secretariat	next WESTPAC Session
36	6.1.3	To liaise with the SFSPA Coordinator, in the view to update the JCOMM Data Management Plan and its Implementation Details so that the DMPA quality management requirements are properly taken into account and complement those for metocean services	S. Iona	end 2014
37	6.1.5	To coordinate the review of the draft framework for Marine Weather Forecaster Competence by DMPA Teams and experts and to liaise with the TT-MCR Chairperson.	S. Iona	Aug. 2014
38	6.1.8	To investigate with the National Centre of Ocean Standards and Metrology (NCOSM) of the State Oceanic Administration (SOA) of China whether NCOSM could take up the role to coordinate the JCOMM entries in the IODE Clearing House, in coordination with the responsible JCOMM Groups, and Expert Teams	S. Lin	ASAP
39	6.1.8	To report on NCOSM possibly taking up the role to coordinate JCOMM entries in the IODE Clearing House to the Management Committee via the DMCG Chair	S. Iona	Oct. 2014
40	6.1.9	To regularly check the documents for the publications and documents they are responsible of in the JCOMM Catalogue of Best Practices and Standards, and to propose changes if required	IODE, ETMC, ETDMP Chairs	ongoing
41	6.1.10	To investigate making the repository (i.e. IODE Clearing House) OAI compliant so best see if we can use DSpace software and possibly extend the metadata structure to allow additional functionality (searching for e.g. IODE, WMO, JCOMM, ... documents)	IODE GE-MIM	ASAP
42	6.1.11	To act as focal point for integrating the existing JCOMM catalogue into the IODE Clearing House repository, and for discussing its functional specifications with the IODE Group of Experts on Marine Information Management (GE-MIM) and the IODE Project Office	E. Charpentier	31 Mar. 2014
43	6.1.12	To get in touch with Mr Marshall on behalf of the Group in order for the DMPA requirements to be taken into account when developing WIGOS Regulatory Materials	M. Kramp	ASAP
44	7.2.7	To coordinate the actions recommended under 7.2.6	IOC, WMO	March 2014

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No.	Ref.	Action item	By	Deadline
			Secretariats	
45	7.2.8	To invite the DBCP to use the opportunity of DBCP-WIO-5 workshop to create the content in OTA. The designated lecturers should contact Dr Claudia Delgado at the IOC Project Office for IODE, Oostende so the necessary preparations can be made including creation of a course outline in Moodle, assistance with content uploading etc.	WMO Secretariat	ASAP
46	7.2.9	To contact the RMIC via Ms Shaohua Lin to investigate further how the training materials (including video recordings) of the RMIC courses organized in China could be migrated to OceanTeacher.	IODE Secretariat	ASAP
47	7.2.10	To investigate ways to discover training materials on the Internet (Google was mentioned as a potential partner)	IODE Secretariat, WMO Secretariat	asap
48	7.2.11	To coordinate the action during the intersessional period for developing a document listing the competency requirements for ocean data management, together with associated training materials (or references to such existing materials)	S. Iona	2017
49	8.1.1.2.3	To contact Roy Lowry of BODC to address the issue of developing and updating code lists through SeaVox and coordinated between the WMO and IOC for JCOMM and suggest people to be included in the discussions and SeaVox Governance Group	S. Iona	ASAP
50	8.1.2.4	To work on defining BUFR common sequences for specific marine meteorological and oceanographic variables	TT-TDC	2017
51	9.1.2	To provide their review of the Data Management Plan and Implementation Details per discussion at DMCG-5 and responsibilities for updating specific sections, to the Secretariat for consolidation purposes	Group members	28 Feb. 2014
52	9.1.2	To provide consolidated copies of the Data Management Plan and Implementation Details to DMCG Chair	Secretariat	15 Mar. 2014
53	9.1.3	To lead the effort in liaison with the Secretariat, and with input from Group members for making publicly available within 10 months the Data Management Plan and its Implementation Details	S. Iona	Sept. 2014
54	9.2.2	To submit comments on the Cookbook through support@jcommops.org	DMCG members	ongoing
55	9.2.2	To finalize the first version of the document, to post it on the JCOMM website, as well as chapters on the OceanTeacher, and to broadly advertise it via JCOMM and IODE (e.g. 1-page flyer to be distributed to participants of JCOMM meetings)	TC DBCP	Mid. 2014

ANNEX IV

2012-2017 DMPA PROJECTS AND WORK PLANS FOR THE INTERSESSIONAL PERIOD (DRAFT)
 (Upon the decisions at JCOMM-IV, May 2012)

Green – Project outcomes achieved by JCOMM-V

White – Completion time line to be determined

Yellow – Possible to achieve the outcomes by JCOMM-V

Blue – Lead by other PAs/Organization

	<i>Workplan / expected outcome, deliverables</i>	<i>How (Key Activities/Actions)</i>	<i>Lead (bold) Members</i>	<i>Timelines</i>	<i>Associated meetings (discussion item in)</i>	<i>Resource Required for (apart from meetings)</i>	<i>ETs (bold)/ Linked With</i>
1	Data Management Plan	Review the Data Management Plan and its implementation details, and update them as needed Review the webpage of DMPA and update as needed	S. Iona Secretariat	2013	Informal DMCG (Nov. 2012) Teleconferences in 2013 DMCG-5 (2014)		DMCG

Workplan / expected outcome, deliverables	How (Key Activities/Actions)	Lead (bold) Members	Timelines	Associated meetings (discussion item in)	Resource Required for (apart from meetings)	ETs (bold)/ Linked With
<p>2 Marine Climate Data System (MCDS)</p>	<p>Review and update the MCDS strategy and develop an implementation plan for achieving the Vision for a new MCDS in 2020 (two steps for JCOMM-5 and JCOMM-6).</p> <p>After ETMC-4, a small group, comprised of Ariel Troisi (Argentina), Sissy Iona (Greece), Nicola Scott (UK), and Gudrun Rosenhagen (Germany), reviewed again and updated the MCDS Strategy on behalf of the Team, taking into account the discussions at this meeting</p> <p>Then this draft MCDS submitted to IDOE-22 for approval</p> <p>IODE 22 approved the strategy and decided to establish an <i>ad hoc</i> team to review the Implementation Plan during the coming intersessional period and invited Member States to propose members of the <i>ad hoc</i> team through a response to a Circular Letter to be issued shortly by the Secretariat. It was noted that the ad hoc team has a deadline to report to the JCOMM DMCG by 30 September 2013 and suggested changes would be forwarded to JCOMM MAN for approval.</p> <p>MAN Jan 2013 agreed on ToR for DACs & GDACs, including performance indicators for participating centres (DACs, GDACS, and CMOCs) to be submitted to IODE-22 for approval</p> <p><i>Candidate MCDS centres to submit statement of compliance and commitment.</i></p> <p>Evaluation of the candidates CMOCs (China, Germany) according to the evaluation criteria following a fast track procedure.</p> <p>The membership of the CMOC accreditation committee has to be defined asap</p> <p>Establishment of MCDS centres that have been successfully evaluated: Work by correspondence with Members / Member States through a fast-track procedure to seek approval of these centres within six months after the IODE Session.</p> <p>Establish a broader JCOMM Pilot Project on ICOADS Value-Added Database (IVAD) to extend the scope of the mechanism to link community developed adjustments back to the individual marine</p>	<p>Chair of ETMC - Gudrun Rosenhagen (until Dec 2014 Nicky's return from maternity leave)</p> <p>Germany, UK, USA, Canada, France</p> <p>S. Woodruff (ICOADS)</p>	<p>Sept. 2013</p> <p>Mid 2014: CMOCs Germany & USA established</p> <p>JCOMM-5 (step 1) – Technical Regulations, establishment of some centres</p> <p>JCOMM-6 (step 2) – Revised Technical Regulations,</p>	<p>Teleconferences (as needed)</p>		<p>ETMC DMCG ETWCH MAN IODE</p>

	<i>Workplan / expected outcome, deliverables</i>	<i>How (Key Activities/Actions)</i>	<i>Lead (bold) Members</i>	<i>Timelines</i>	<i>Associated meetings (discussion item in)</i>	<i>Resource Required for (apart from meetings)</i>	<i>ETs (bold)/ Linked With</i>
3	Ocean Data Portal (ODP)	<p>Continue to collaborate in the development of IODE ODP.</p> <p>Develop synergies between ODP and WIS, especially in terms of (ii) interoperability between ODP and WIS and review of relevant metadata profiles (MCP, CDI, WMO core), (ii) WMO and IOC data policies, (iii) implementation of ODP and the implementation of WIS nodes so as to avoid duplication.</p> <p>The agreements for the establishment of a Partnership Centre for IOC/IODE ODP in Obninsk -as an 'in kind' contribution of the Russian Federation into the activities of IOC and JCOMM, has been signed and the Centre is expected to operate in Sept. 2013</p>	Sergey Belov	JCOMM-5	<p>ETDMP-4 (2014)</p> <p>Teleconferences as needed</p>		ETDMP DMCG IODE CBS
4	Ocean Data Standards (ODS)	<p>The ODS process has been reviewed including mechanisms to maintain or update an accepted standard.</p> <p>The submitted standards have been reviewed, a third standard is recommended and new standards have been identified by the ETMP for submission to the ODSBP..</p> <p>Follow up on the implementation of the recommended standards by Members/Member States.</p> <p>IODE-22 established the ODSBP Project (Standards and best Practices</p>	Sergey Belov	JCOMM-5	<p>)</p> <p>Teleconferences as needed</p>		ETDMP DMCG IODE

<i>Workplan / expected outcome, deliverables</i>	<i>How (Key Activities/Actions)</i>	<i>Lead (bold) Members</i>	<i>Timelines</i>	<i>Associated meetings (discussion item in)</i>	<i>Resource Required for (apart from meetings)</i>	<i>ETs (bold)/ Linked With</i>
5 Migration to Table Driven Codes	<p>Finalize generic BUFR sequences for ocean variables.</p> <p>Update or develop new BUFR templates for ocean data to take into account the generic BUFR sequences for ocean variable.</p> <p>Finalize the BUFR Master Table 10.</p> <p>Implement the approved BUFR templates for operational distribution in real-time of ocean data of various platform types.</p> <p>Bob Keeley (Canada) and Joaquin Trinanes (USA) have discussed a BUFR template for CTD data, which may have to be submitted to the CBS Inter-Programme Expert Team on Data Representation Maintenance and Monitoring (IPET-DRMM).</p> <p>David Berry (UK) to coordinate with Joaquin Trinanes in the view to submit the template to the DMPA Task Team on Table Driven Codes (TT-TDC) for their review, and further submission to the CBS</p>	David Berry (for the next 2 years))	ASAP	<p>Teleconferences as needed</p> <p>SOT-7 (Apr. 2013)</p> <p>IPET-DRC (2013)</p>		TT-TDC CBS IPET-DRC
5 DMPA Capacity Building	<p>Continue organizing capacity development initiatives, including: Training courses on the Ocean Data Portal (ODP), on ocean and marine meteorology data management including cross-discipline introductory courses.</p> <p>Finalize JCOMM “Cookbook” and publish it as a JCOMM Technical Report.</p> <p>Organize the fourth JCOMM Workshop on Advances in Marine Climatology (CLIMAR-IV) around 2014, and the fourth MARCDAT in 2016</p>	A. Mafimbo	<p>Mid 2013 - Cookbook</p> <p>JCOMM-5</p>	<p>CLIMAR-4 (2014)</p> <p>MARCDAT-4 (2016)</p>		DMCG ETMC

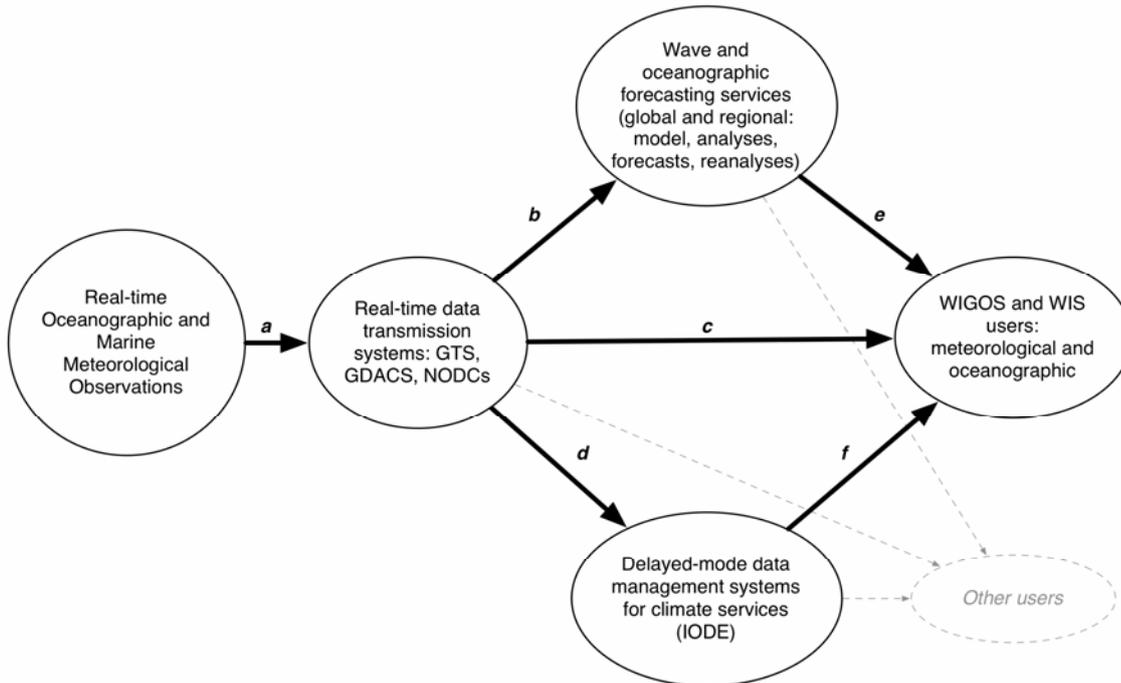
	<i>Workplan / expected outcome, deliverables</i>	<i>How (Key Activities/Actions)</i>	<i>Lead (bold) Members</i>	<i>Timelines</i>	<i>Associated meetings (discussion item in)</i>	<i>Resource Required for (apart from meetings)</i>	<i>ETs (bold)/ Linked With</i>
6	Improved Data Integration and Access	Promote an interoperable system that provides an accessible flow of data from real time to climate archives; establish and publish access routes to the authoritative data sets for the JCOMM and JCOMM-associated observing system elements	C.Clark S.Iona B.Keeley	end 2013 for assessment and recommendations	OCG-5 (9/13) GOOS SC-2 (3/13) DMCG		OCG DMCG GOOS SC



ANNEX V

PROPOSED NEW TERMS OF REFERENCE AND MEMBERSHIP OF THE**JCOMM CROSS CUTTING TASK TEAM
INTEGRATED OCEANOGRAPHIC SERVICES FOR WIGOS AND WIS**

The JCOMM Cross-cutting Task Team shall overview and discuss the necessary requirements for building the architecture and the interfaces between WIGOS/WIS and Oceanographic services. The scheme below indicates some of the relevant data flows for this Team.



A glossary for the terminology used in this ToR is given in the Addendum. The Task Team shall conduct the following tasks for the period of 2013-2016:

- a) Work as the JCOMM focal point for the OPA, DMPA and SFSPA coordination groups, appropriate Expert Teams, and appropriate outside groups to continue the legacy of the JCOMM Pilot Project for Marine Observations in WIGOS and further develop it toward the 2013-2016 JCOMM Strategic goals;
- b) Work as the JCOMM focal point to upgrade and enlarge the scope of the JCOMM Pilot Project for WIGOS by:
 - (i) Building on work by the JCOMM OPA/DMPA on identification of Data Access Routes (by consultant Robert Keeley), identifying the present architecture of real-time and delayed-mode data flows from global observing networks and services to oceanographic and meteorological distribution systems, data repositories, and analysis and forecasts services; and identifying existing standards and best practices (all arrows in the scheme);
 - (ii) Make recommendations to improve the interoperability of the Near Real Time data standards, the Delayed Mode data standards and ocean analysis and forecasting product standards in line with the WIS requirements both in terms of formats and distribution mechanisms and infrastructure (all arrows in the scheme);
 - (iii) Where gaps exist, develop requirements for near-real-time data delivery standards supporting marine meteorological and oceanographic analysis and forecast services

- developed in the Services Programme Area, the National Meteorological Services of WMO and Oceanographic Centres of IOC (arrow b, c and e in the scheme);
- (iv) Where gaps exist, and in cooperation with the Ocean Observations panel for Climate, developing requirements for Near real-time observational data delivery standards in the JCOMM Observations Program Area, Data Management Program Area and linked programmes (including GOOS and GCOS), that shall contribute to Delayed Mode Data Archives of the IODE network and the new Global Framework for Climate Services (arrows a, d and f in the scheme);
 - (v) Develop ocean analyses and forecasting products data delivery standards that shall enhance capacity of all maritime countries, in cooperation with ETOOFS but also in consultation with GODAE OceanView and the WCRP/CLIVAR Global Synthesis and Observations Panel (arrows e and f in the scheme);
 - (vi) For all the work above, identify the GOOS Regional Alliances contribution to WIGOS and WIS;
 - (vii) Design and promote the oceanographic components of the Data Collection and Production Centres of WIGOS for both observations and forecasting services;
- c) Submit the JCOMM Management Committee, by its 11th session in 2014, a draft of “JCOMM Ocean Integrated System requirements for the oceanographic and meteorological components of WIGOS”;
 - d) Provide inputs to the capacity building activities of JCOMM under the appropriate areas (e.g. through training materials, and workshops);
 - e) Provide input to regular update of the WMO Rolling Review of Requirement (RRR) and the Statement of Guidance (SoG) for Ocean Applications, for the parts relating to the Team responsibilities;
 - f) Coordinate with appropriate programmes of WMO and IOC to develop and document best practices and standards for data and product integration; in particular, examine format interoperability and data homogenization issues, and make recommendations for the implementation of a system or standards.
 - g) Develop Pilot Projects to partially implement components of the system

Membership:

The following Co-Chairs are proposed:

- – Co-Chair¹
- – Co-Chair

Guidance for selecting membership of the TT:

- 1) JCOMM PA representatives
 - 2) IODE representative
 - 3) OOPC representative
 - 4) Marine Climate Data Center strategy representative
 - 5) GRA representative
 - 6) GODAE OceanView
 - 7) CLIVAR GSOP
 - 8) Other WMO relevant groups
 - 9) Other IOC relevant groups
-

¹ Comment: One chair from met community, one from ocean? Possibly from EMODNET community? Patrick Gorringe?

ANNEX VI

SECURITY REQUIREMENTS FOR THE ENCRYPTION/DECRYPTION OF SHIP'S CALL SIGN

(Requirements initially proposed by Mr Richard Weedon of the UK Metoffice, and then reviewed by the SOT Task Team on Ship Masking¹, and the JCOMM Task Team on Table Driven Codes²)

References –

SOT-7/DOC.6 Rev.3 (JCOMM Reports and Recommendations by the Task Teams - submitted 22nd April 2013)

Conditions for Encryption

Ship's call sign are encrypted within FM-94 BUFR (BUFR) reports distributed in real-time onto the Global Telecommunication System (GTS) whenever the country recruiting the ship decides so in order to protect the identity of the ship (the so called ENCODE scheme). The country recruiting a ship may also decide not to encrypt a call sign, and transmit either the real ship's call sign (the so called REAL scheme), or a unique identification number allocated to the ship by the recruiting country per the MASK scheme agreed upon by the Ship Observations Team (SOT) of JCOMM (see the WMO website³ for details). These security requirements below only apply to encryption/decryption of the ship's callsign (ENCODE scheme).

Whenever the ENCODE scheme is used, only the ship's call sign will be encrypted (possibly using the date and time in the encryption routine so as to produce a unique non-repeating encrypted value).

Proposed Security Requirements -

1. The Organisation shall protect the ship's call sign for the duration of two years from the time of validity of the BUFR message containing this call sign.
2. To allow for the historical use of data, the Organisation shall protect the decryption keys for a period of at least 2 years (the recruiting country may wish to request for a specific decryption key to be protected for a longer period) from the time of validity of the last BUFR report using that key.
3. The Organisation shall use the decryption method and the decryption key(s) provided by the Secretary General of WMO.
4. The Organisation shall ensure that only authorised people within the organisation can have access to the decrypted BUFR messages containing the ship's call signs.
5. The Organisation shall only authorise people within the organisation to see the decrypted call signs where they have a genuine business or scientific need.
6. The Organisation shall only transmit the original BUFR messages (i.e. not the decrypted BUFR messages) to other organisations. See footnote⁴.
7. The Organisation shall ensure that appropriate sanctions are in place for any transgression of the agreement between the Organisation and the authorised person within the Organisation.

1 http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=150

2 http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=199

3 http://www.wmo.int/pages/prog/amp/mmop/JCOMM/OPA/SOT/VOS_masking.html

4 From UKMO's perspective, the Organization means UK Met Office only. It does not include legitimate third party organizations such as NOC (i.e. National Oceanography Centre) or other NHMS. If such third party organizations require decrypted data, they must apply to the WMO Secretariat / JCOMM for the decryption key.

8. The Organisation shall report to the WMO Secretary General any incident that has resulted in an actual or potential breach of the secret information (i.e. reports containing the decrypted call sign and/or the decryption key(s)), and what action has been taken.

Governance

- The governance for the management of encryption methods and keys will be under the authority of the WMO Secretary General. The JCOMM will be responsible to make proposals at the technical level. Such proposals shall be submitted to the WMO Secretary General by the JCOMM Co-President(s).
 - The WMO Secretary General will authorize making the encryption key available to an Organisation after a formal confidentiality agreement has been signed by the Permanent Representative of that Organisation.
 - Any breach of the security requirements could result in the Organisation having the key(s) withdrawn.
-

ANNEX VII

PRIORITY ACTIVITIES OF THE TASK TEAM ON TABLE DRIVEN CODES (TT-TDC) FOR THE NEXT 12 MONTHS

The Data Management Coordination Group agreed with the following priorities of the TT-TDC for 2014:

1. To resubmit the VOS template taking various comments on board with respect to additional elements not included in the previous proposals and to have the revised template operational by May 2015;
2. To submit a draft template for ARGO data to the IPET-DRMM providing the template can be represented by BUFR Master Table 0; and
3. To work towards finalizing the next operational version of Master Table 10 (MT10) and to define the procedures for modifying this table.

ACRONYM LIST

Argo	International profiling float programme
asap	As soon as possible
ASAP	Automated Shipboard Aerological Programme
BOM	Bureau of Meteorology (Australia)
BUFR	Binary Universal Form for the Representation of meteorological data (FM 94 BUFR)
CB	Capacity-Building
CBS	WMO Commission for Basic Systems
CCI	WMO Commission for Climatology
CD	Capacity Development
CDI	SeaDataNET Common Data Index
CDS	WMO Capacity Development Strategy
CEOS	Committee on Earth Observations Satellites
CF	Climate and Forecast convention
Cg	WMO Congress
CLIMAR	JCOMM Workshops on Advances in Marine Climatology
CLIVAR	WCRP Climate Variability and Predictability Programme
CMOC	WMO-IOC Centres for Marine-meteorological and Ocean Climatological Data
CTD	Conductivity, Temperature, and Depth measurement
DAC	Data Acquisition Centre
DAC	Data Assembly Centre
DBCP	Data Buoy Co-operation Panel
DCPC	Data Collection and Production Centre (of WIS)
DM	Data Management
DMAC	IOOS Data Management and Communications (USA)
DMCG	JCOMM Data Management Coordination Group
DMFC	Data Management Framework for Climate
DMPA	JCOMM Data Management Programme Area
DMPlan	JCOMM DMPA Data Management Plan
DNA	IODE Designated National Agencies
ECV	Essential Climate Variable
EMODnet	European Marine Observation and Data Network (EU)
ENCODE	Ship masking scheme whereby a unique, non-repeating identifier is used; the identifier is derived from encrypting elements in the message, e.g. callsign + latitude + longitude
ET	Expert Team
ETCCDI	Joint CCI-CLIVAR-JCOMM Expert Team on Climate Change Detection and Indices
ETDMP	JCOMM-IODE Expert Team on Data Management Practices
ETMC	JCOMM Expert Team on Marine Climatology
ETRP	WMO Education and Training Programme
ETSI	JCOMM Expert Team on Sea-Ice
ETWCH	Expert Team on Waves and Coastal Hazards Forecasting Systems
EU	European Commission
EU	European Union
EUMETNET	Network of European Meteorological Services
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FP7	Seventh Framework Programme
FTP	File Transfer Protocol
GCC	MCSS Global Collecting Centre
GCOS	WMO-IOC-UNEP-ICSU Global Climate Observing System
GDAC	Global Data Assembly Centre
GDP	Global Drifter Programme
GDSIDB	Global Digital Sea Ice Data Bank

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GE-BICH	IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices
GE-MIM	IODE Group of Experts on Marine Information Management
GEO BON	GEO Biodiversity Observation Network
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GEOWOW	GEO Weather, Ocean and Water
GFCS	Global Framework for Climate Services
GISC	Global Information System Centres (of WIS)
GLOSS	JCOMM Global Sea-level Observing System
GLOSS-GE	GLOSS Group of Experts
GODAR	Global Oceanographic Data Archaeology and Rescue
GOOS	WMO-IOC-UNEP-ICSU Global Ocean Observing System
GOSUD	Global Ocean Surface Underway Data Pilot Project
GRA	GOOS Regional Alliance
GTS	Global Telecommunication System
GTSP	Global Temperature and Salinity Profile Programme
HAB	IOC Harmful Algal Bloom Programme
HPTE	WMO High Profile Training Event
HQC	Higher-level QC
HQCS	Higher-level Quality Control Standard
HQ-GDMSC	CCI High Quality Global Data Management System for Climate
HTTP	Hypertext Transfer Protocol
ICAM	Integrated Coastal Area Management
ICES	International Council for the Exploration of the Sea
ICOADS	International Comprehensive Ocean-Atmosphere Data Set (USA)
ICSU	International Council for Science
ICT ISS	CBS Implementation Coordination Team on Information Systems and Services
IOC	Intergovernmental Oceanographic Commission of UNESCO
IOC-Africa	IOC-UNESCO Sub-Commission for Africa and the Adjacent Island States
IOCARIBE	UNESCO IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IOC-WESTPAC	IOC Sub-Commission for the Western Pacific
IODE	International Oceanographic Data and Information Exchange (of IOC)
IPET-DRMM	WMO Inter Programme Expert Team on Data Representation Maintenance and Monitoring
ISDM	Integrated Science Data Management (Canada)
ISO	International Organization for Standardization
ISO-23950	Information and documentation - Information retrieval (Z39.50) - Application service definition and protocol specification
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM <i>in situ</i> Observations Programme Support Centre
LDP	ODP Light Data Provider
LMS	Learning Management System
M&G	Manuals and Guides
MAN	JCOMM Management Committee
MARCDAT	International workshop on Advances in the Use of Historical Marine Climate Data
MASK	Ship masking scheme whereby a unique, repeating identifier is used; the masking identifier is assigned by the NMS that recruited the ship
MCDS	Marine Climate Data System
MCP	Marine Community Profile
MCSS	Marine Climatological Summaries Scheme
MEDI	IODE Marine Environmental Data and Information Referral System
META-T	Water Temperature Metadata Pilot Project

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MQCS	Minimum Quality Control Standard
MT10	BUFR Master Table number 10 (Oceanographic Data)
MWF	Marine weather forecaster
NC	National Centre (of WIS)
NCDC	NOAA National Climatic Data Center (USA)
NCEP	NOAA National Centers for Environmental Prediction (USA)
NDBC	NOAA National Data Buoy Center (USA)
NetCDF	Network Common Data Form
NMDIS	National Marine Data and Information Service (China)
NMHS	National Meteorological and Hydrographic Service
NOAA	National Oceanic and Atmospheric Administration (USA)
NODC	IODE National Oceanographic Data Centre
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OBIS	Ocean Bio-geographical Information System
ODAS	Ocean Data Acquisition System
ODASMS	ODAS Metadata Service
ODIN	IOC Ocean Data and Information Network
ODINAFRICA	ODIN for Africa
ODINCARSA	ODIN for the Caribbean and South America
ODINWESTPAC	Ocean Data and Information Network for the Western Pacific
ODIP	Ocean Data Interoperability Platform
ODP	UNESCO/IOC-IODE Ocean Data Portal
ODS	IODE-JCOMM Ocean Data Standards Pilot Project
ODSBP	IODE-JCOMM Ocean Data Standards Best Practices Project
OGC	Open Geospatial Consortium
OGP	Oil and Gas Producers
OPA	JCOMM Observations Programme Area
OPACE	Open Panels of CCI Experts
OPAG	Open Programme Area Group
OPeNDAP	Open-source Project for a Network Data Access Protocol
OT LMS	OceanTeacher Learning Management System
OT	OceanTeacher
OTA	OceanTeacher Academy
OTGA	OceanTeacher Global Academy
PA	Programme Area (of JCOMM)
PANGEA	Partnership for New GEOSS Applications
PMO	Port Meteorological Officer
QA	Quality Assurance
QC	Quality Control
QMF	Quality Management Framework
QMS	Quality Management System
RIHMI-WDC	All Russian Research Institute of Hydrometeorological Information – World Data Centre
RMIC	WMO-IOC Regional Marine Instrument Centre
RNODC	IODE Responsible National Oceanographic Data Centre
RNODC/DB	RNODC for Drifting Buoys
RTC	Regional Training Centres
SeaDataNet	Pan-European infrastructure for Ocean and Marine Data Management
SFSPA	JCOMM Services and Forecasting Systems Programme Area
SG-QMF	Steering Group for the IODE Quality Management Framework
SHIP	Ship masking scheme whereby a non-unique identifier is used; the callsign is unilaterally replaced by the letters “SHIP”
SOC	Specialized Oceanographic Data Centre (of former IGOSS, now JCOMM)
SOC/DB	SOC for Drifting Buoys
SOT	JCOMM Ship Observations Team
SRU	Search/Retrieve via URL
SSS	Sea Surface Salinity

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SST	Sea Surface Temperature
TAC	Traditional Alphanumeric Code form
TCP	Tropical Cyclone Programme
TDC(s)	Table Driven Code(s)
TOR	Terms of Reference
TT-DMVOS	SOT/ETMC Task Team on Delayed Mode VOS Data
TT-IOSWW	Task Team on Integrated Marine Meteorological and Oceanographic Data and Services in the framework of WIGOS and WIS
TT-MCDS	Task Team on the Marine Climate Data System (TT-MCDS)
TT-MCR	JCOMM <i>ad hoc</i> Task Team on Marine Competency Requirements
TT-SAT	JCOMM cross cutting Task Team on Satellite Data Requirements
TT-TDC	DMPA Task Team on Table Driven Codes
TT-WRM	WIGOS Task Team on Regulatory Materials
UCAR	University Corporation for Atmospheric Research (USA)
UN	United Nations
UNEP	UN Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VCP	Voluntary Cooperation Programme
VOS	Voluntary Observing Ship
VOSClim	Voluntary Observing Ship Climate [class of Vessel; formerly project]
WCP	World Climate Programme
WCSP	World Climate Services Programme
WDC	ICSU World Data Centre
WDS	ICSU World Data System
WESTPAC	IOC Sub-committee for the Western Pacific
WG	Working Group
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization
WOA	World Ocean Atlas
WOD	World Ocean Database
WWW	World Weather Watch
XBT	Expendable Bathythermograph
XCTD	Expandable Conductivity Temperature and Depth probe
XML	Extensible Markup Language