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DATA MANAGEMENT PROGRAMME AREA INCLUDING INFORMATION SYSTEMS AND DATA EXCHANGE

BACKGROUND MATERIAL

SUMMARY

CONTENT OF DOCUMENT:

Appendix A: Progress and Achievement of the JCOMM Data Management Programme Area

Appendix B: Implementation details of the JCOMM Data Management Plan

RELATED DOCUMENT:

JCOMM-4/Doc. 7: JCOMM Data Management Programme Area: Achievements and Future Priorities

PROGRESS AND ACHIEVEMENT OF THE JCOMM DATA MANAGEMENT PROGRAMME AREA

1 Progress and achievements of the two JCOMM DMPA Expert Teams (JCOMM/IODE Expert Team on Data Management Practices – ETDMP –, and JCOMM Expert Team on Marine Climatology – ETMC) are detailed in Documents 7.3 and 7.2 respectively. The progress and achievements related to the Ocean data Standards Process is reported in Document 7.1. This document will focus mainly on the progress with the JCOMM Data Management Plan.

2 The present structure of JCOMM (in 2009) has three Programme Areas (PAs), one for Observations (OPA), one for Services and Forecasting Systems (SFSPA) and one for Data Management (DMPA). The groups in the OPA and SFSPA are focused on activities supporting a type of data (or sometimes an observing technique), or on a service such as safety or emergency support. Each of these has its own history of managing data and information prior to its incorporation into JCOMM. When JCOMM was formed, a decision had to be made about how to organize the cross-cutting activities of data management. The choice was made to place data management in a separate PA to recognize that managing the data and information of JCOMM is an important activity equal to acquiring and delivering data and services. The potential weakness is that the activities of the DMPA may not be strongly linked to the day-to-day data management activities in the various groups of the other PAs. The challenge of the DMPA is to work within the requirements of the activities within the OPA and SFSPA and still achieve the broad goals of JCOMM. It was therefore decided to prepare a "**JCOMM Data Management Plan**", drafted by the members of the JCOMM Data Management Coordination Group (DMCG). This plan proposes an approach that looks for commonalities across all of these systems and exploits these to improve interoperability. A main goal of this DMPlan, therefore, must be to explain how data management can be conducted under the present structure to promote the long-term objectives of JCOMM.

3 An examination of the long-term objectives of JCOMM and expectations for action by JCOMM, such as from the GCOS-IP, require that:

- there exists a functioning system of reliable and regular observations at sea;
- the data and information come to processing centres in a timely way;
- notifications of hazardous conditions are issued to mariners or nations in time to take action to avoid potential harm;
- data collected by JCOMM activities be maintained over many years such that climate variability, trends, and prediction can be studied and advanced;
- information be maintained about the observing practices so that older data may be compared to more recent data;
- there be standardization in such areas as data formats, content, naming conventions, processing procedures, etc., to ensure interoperability;
- data version control be addressed; and
- data management activities and experiences are made available equally to all WMO-IOC Members / Member States.

4 The Plan divides the tasks into main areas and makes recommendations in each. The data management themes used are:

1. Data and Information Exchange
2. From Collectors to the Shore
3. Using the Global Telecommunication System(GTS)

4. Using the Internet
   - 4.1 Network Common Data Form (netCDF)
   - 4.2 Extensive Markup Language (XML)
   - 4.3 Other Formats and Data Structures

5. Data Processing
   - 5.1 Data Version
   - 5.2 Data Quality
   - 5.3 Duplicates
   - 5.4 Contents
   - 5.5 Processing history
   - 5.6 Metadata
   - 5.7 Model Data
   - 5.8 Specialized Oceanographic Data Centres (SOCs) and Responsible National Oceanographic Data Centres (RNODCs)

6. Access
   - 6.1 Discovery
   - 6.2 Browse
   - 6.3 Data Delivery
   - 6.4 Data Access Policies and Security

7. Coordination and Linkages
   - 7.1 Within JCOMM Activitie
   - 7.2 With IODE Activities
   - 7.3 With Other IOC Programmes
   - 7.4 With WMO
   - 7.5 With ICSU WDCs
   - 7.6 With Other Programmes

8. Communications

5 The plan presents a review of the various components of data management that must be considered as part of JCOMM. It makes a number of recommendations. Some of these are, in fact, underway either as formal projects in JCOMM, as an activity undertaken by one or more members, or as activities undertaken by other organizations with which JCOMM is linked. Most of the work requires coordination of activities across WMO-IOC Members / Member States participating in JCOMM. Developing this degree of cooperation will be a challenge. The national organizations of each Member / Member State have national priorities and objectives that must be met. Progress will be made by aligning these national requirements with activities at an international scale. The full Plan is available from the JCOMM website (see reference in the heading of this document).

6 In addition to the JCOMM Data Management Plan, a document entitled “Implementation Details of the JCOMM Data Management Plan” was prepared by Mr Robert Keeley (former DMPA Chairperson) and Ms Sissy Iona (DMPA Chairperson). Its purpose is to link the many recommendations of the Data Management Plan and to elaborate them as concrete tasks and actions that will realize the objectives of the plan. The information presented here records progress against each recommendation in the DMPlan and as such needs to be updated regularly. Undoubtedly, ideas change and the work of implementation must move with new ideas and technology. The information is presented with the same overall themes of the DMPlan (i.e. Data and Information Exchange, Data Processing, Access, Coordination and Linkages, and Communications). The summaries provided are based on a more detailed list of tasks and work that includes target dates and responsible persons. The document is attached in the Appendix.

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Implementation of the JCOMM Data Management Plan

Prepared by
Bob Keeley, Former DMPA Chairperson
Adapted by Sissy Iona, DMPA Chairperson

February 2012

Introduction

This document is a companion to the JCOMM Data Management Plan (DMPlan). Its purpose is to link the many recommendations of the DMPlan and to elaborate them as concrete tasks and actions that will realize the objectives of the plan. To this end, the recommendation numbering present in the DMPlan is preserved in this report. This is done using the prefix DMP and the numbering in the DMPlan for the various sections and recommendations.

The information presented here records progress against each recommendation in the DMPlan and as such needs to be updated regularly. Undoubtedly, ideas change and the work of implementation must move with new ideas and technology.

The information is presented with the same overall themes of the DMPlan (i.e. Data and Information Exchange, Data Processing, Access, Coordination and Linkages, and Communications). The summaries provided are based on a more detailed list of tasks and work that includes target dates and responsible persons.

Because many acronyms are used in this report, a glossary is provided at the end to assist readers unfamiliar with them.

DMP 4.0: Data and Information Exchange

This section treats issues that deal with moving the data from where they are collected to the appropriate shore facilities and archives in time frames that are required to meet operational or other needs. It encompasses all of the data management issues that arise from collection activities through to user-ready data sitting in well managed archives. The discussion is divided into a number of subsections and each contains a number of recommendations and actions. The sections below provide a brief summary of the implementation sequence to realize the recommendations.

DMP 4.1: From Collectors to the Shore

Recommendation 4.1: JCOMM should encourage instrument manufacturers to standardize the formats of the data and information coming from instruments used at sea.

Short term actions: There have been some developments by manufacturers experimenting with what is called sensorML. While this is not a standardization of formats, it is a standardization of a data structure. This can be encouraged. Chair DMCG has raised the issue with OCG, and tabled it with scientific programmes through representation at OOPC. Dialogue can also take place through contact of HMEI with the WIGOS-PP.

Follow on actions: This will be an ongoing activity to encourage manufacturers through interactions with the people who buy and use oceanographic and meteorological instruments. Members of OPA and SPA can be helpful in communicating the desirability of standards to instrument manufacturers.

Comments & progress: *There was a community white paper at OceanObs'09 concerning SensorML.* ***Action: be kept informed of this.*** *The Hydro-Meteorological Equipment Industry Association (HMEI) has been informed and feedback sought. While the delayed mode data flow of ship data from ship to shore should be standardized, the DMCG-IV agreed that this was not necessarily the case for the real time data. It requested the ETMC to investigate the use of SensorML for recording and transmitting instrument metadata from ship to shore in delayed mode.*

DMP 4.2: Using the GTS

Recommendation 4.2a: DMPA lead the development of the detailed plan to change GTS data

reporting from TACs to TDCs.

Short term actions: DMPA has created a formal task team (TT-TDC) with representation from others in OPA Panels where all of the current BUFR templates have originated.

: A second activity (Meta-T) is the standardization of metadata that started under SOT but has been picked up by DMPA. This has identified the relevant metadata and decided what needs to travel with the data, what can be held independently for reference and what needs to be archived with the data. Servers are running in China and U.S.A. and a demonstration is planned for JCOMM-III.

: A third activity is to assist in the development of a CREX version for sea level in support of multi-hazard warning systems. This work has been completed.

Follow on actions: Ensuring the acceptance of BUFR templates for all code forms used by JCOMM and validating these forms before they are used on the GTS.

: Current BUFR templates have the same or similar information organized in different ways because they were developed independently. We intend to unify the way the same information appears in templates to simplify the construction and maintenance of software.

: The work of the Meta-T group will need to be extended to more variables than it currently considers and linked to the Chinese efforts on ODAS.

: BUFR tables will need to be examined to ensure the presence of non-physical variables as required for reporting from coastal regions.

Comments & progress: *The XBT template has progressed to validation and in so doing an oversight was found that will require going back to IPET-DRC (was ETDRC). Hester Viola is the DMPA contact to them.*

: We have started to deal with the VOS template. Target for a mostly completed version is the ETMC meeting in February. This is possible. ***Action: A report from TT-TDC would be useful.***

: There was no demo of Meta-T at JCOMM-III. This needs attention through contact with Derrick Snowden and Cathy What progress there is to link to ODAS? ***Action: A report on Meta-T is needed.***

Recommendation 4.2b: The DMPA in association with the appropriate WMO committee should evaluate MT10 for its relevance to present needs.

Short term actions: A number of years ago a second BUFR Master Table, called MT10, for oceanographic variables was developed experimentally. This version allows for a different organization of BUFR descriptors and has descriptors for a wide variety of non-physical data. It has been adopted by the GHRSST Project. A modified version has been presented to ET-DRC to bring MT10 into conformance with present practices. This was accepted with some minor changes to complete.

Follow on actions: With the acceptance of MT10, data contributors can be encouraged to start using it for existing or new data types for which no entries exist in MT0.

Comments & progress: *Some work was done on MT10, but there are a few things left before it can go to validation. It is on the list of TT-TDC to do. MT10 may be the right vehicle for coastal ocean data. A survey should be made at some point regarding the potential use of BUFR Master Table 10 (MT10).*

Recommendation 4.2c: Enhanced interaction between JCOMM and CBS or other appropriate WMO committees is needed to expand the scope of table driven codes to more fully incorporate JCOMM considerations, including software reliability, human readability, and the archival and exchange of historical and delayed-mode data in its originally reported form.

Short term actions: JCOMM DMPA has representation through the Joaquin Trinanes (AOML), and the JCOMMOPS TC. They are communicating JCOMM needs to ET-DRC.

Follow on actions: There is the need to continue to work closely with CBS to ensure JCOMM interests are considered. As more ocean data centres become involved in operational ocean modelling and prediction systems, there will be greater collaboration between IODE and NMHCs. This is to be encouraged. The work of the task team mentioned under 4.2a is important.

Comments & progress: *The WIGOS project has been a good vehicle to get this cooperation going and sustained.* ***Action: Greg Reed, WIGOS leader and Nick Mickailov, ETDMP chair to provide an update.*** *Ms Maureen Pagnani (NOC, Southampton) has been nominated for participating in the TT-TDC and represent OceanSITEs.*

DMP 4.3: Using the Internet

Recommendation 4.3.1a: JCOMM to support the widespread use of netCDF as a data exchange format.

Short term actions: Argo, GOSUD, OceanSITES and GTSPP all are using netCDF at present. Thomas Loubrieu (France) represented JCOMM at a meeting of the newly formed WMO ET-ADRS

Follow on actions: JCOMM and IODE are developing a manual on the establishment of an NODC. Inclusion of discussions of formats and data structures should be part of this. There should be continued participation in the ET-ADRS.

Comments & progress: *Thomas attended one of the ET-ADRS meetings, and his report on ocean data systems provided to S. Iona. ET-ADRS no longer exists, and JCOMM should now work through the IPET-DRC, and the IPET-MDI.* ***DMCG-IV*** *noted that the ODP is planning to permit the use of netCDF for transport of data; CF will be used as of 2011 but there are issues to be resolved.*

Recommendation 4.3.1b: JCOMM to encourage usage of CF convention for variable naming in netCDF and stay informed of CF updates to meet JCOMM contributors' needs.

Short term actions: The CF convention has become the recommended standard for Argo. This will be encouraged in other projects currently using or starting to use netCDF.

Follow on actions: Greater awareness of CF and other standards is required within JCOMM data management activities. Increasing broad awareness will need a number of approaches including prominence on web sites, active encouragement by JCOMM in training materials and the planned use in the WIGOS-PP.

Comments & progress: *There appears to be a need to reconcile CF and BODC/SeaDataNet conventions.* ***Action: to pursue this again at the SDN meetings or directly with Roy.*** *SeaDataNet did not make substantial progress in using CF despite the fact that CF was formally adopted by SeaDataNet*

Recommendation 4.3.1c: JCOMM stay informed on netCDF maintenance and developments.

Short term actions: Some JCOMM members are already using netCDF. Since most of them are in the OPA, good connections with OPA are needed.

Follow on actions: netCDF is known to be weak in supporting the characteristics of point data, a type that is very prevalent in JCOMM. While some steps have been taken by netCDF developers, more is required. DMCG or JCOMM members actively involved in managing point data (in particular) need to work with netCDF developers. This is taking place within the Argo programme.

Comments & progress: *NetCDF has issued version 4 which goes part way (all the way?) to solving the problem of point data.* ***Action: find out if the strong netCDF users such as IFREMER/Coriolis have experience with V4. Steve Hankin of PMEL is a good contact for netCDF developments.***

: *Discussion with Greg if we need to provoke IODE to discuss the use of netCDF. This could be done through a paper for the next IODE meeting or by proposing netCDF through the IODE/JCOMM Standards Process.*

Recommendation 4.3.2a: Address the use of XML tags for metadata.

Short term actions: The ETDMP E2E prototype project in WIS defined and used xml tags for information about data holdings. This has been incorporated into the WIGOS-PP and will be used by a wider group of participating centres.

Follow on actions: Continue to develop the use of xml in WIS and WIGOS projects.

: A MarineXML project was operating with support from IODE a few years ago. Some JCOMM members were also involved. The results, while interesting, have not been implemented.

Comments & progress: *MCP has an xml implementation which is very well developed. Is there is any implementation of xml for delivering data? (I do not know any). Web services and WCS developments perhaps is where we will see this. DMCG-IV proposed to differentiate between tags for metadata (easier) and tags for data (more difficult). ODP v1 can provide XML for data (with three options: NetCDF, ASCII, XML) but this creates a big XML file that is not really being used at this point. Some developments will be done for v2 of ODP and SeaDataNet and feedback is needed in this regard. The ETDMP Task Team on Metadata should be asked to make proposals on XML tags based on feedback from ODP and SeaDataNet experiments.*

Recommendation 4.3.2b: DMPA encourage the development of vocabularies used in xml that are as close as possible to those used in other formats.

Short term actions: The collaboration of the JCOMM WIGOS-PP with WIS is contributing to this objective.

: Other work related to standards is also taking place. The Marine Community profile and the discovery metadata definitions within the WIGOS-PP are a start.

: The European Union's SeaDataNet project has made significant progress in developing standard vocabularies. DMPA needs to examine these and encourage their broader use to the extent possible.

Follow on actions: JCOMM members are working closely with the Marine Metadata Initiative lead by the Monterey Bay Aquarium. This initiative is focusing on bringing

together vocabularies (among other things) and building a way to mapping terms from one to another. This is an important endeavour that will impact JCOMM and so JCOMM must continue to be involved.

Comments & progress: *Are the xml tags used in WIGOS standardized with other vocabularies? To check with Nick. The ETDMP Task Team for metadata should address this Recommendation.*

Recommendation 4.3.3a: JCOMM must recognize that other formats and data structures besides netCDF will have appeal and encourage activities that broaden their use and standardize their content.

Short term actions: Progress has been made on BUFR templates for ocean data sent on the GTS.

Follow on actions: New technology will continue to provide both new kinds of data and increasing information. New data structures will be needed that are robust to allow for the inclusion of this new information. These data structures should develop in the context of standards for content.

Comments & progress: *There is some progress on standardizing content within BUFR templates. This may have some spill over into this more general recommendation.*

Recommendation 4.3.3b: JCOMM work with partners to encourage the evolution of exchange formats to more robust and stable forms, while at the same time assuring that sufficient flexibility and agility can be preserved for the archival of JCOMM's delayed mode data and metadata.

Short term actions: Activity has taken place in past years in the context of the IMM format that supports ICOADS.

: The work on standardizing content in BUFR templates is related to this objective.

: With the development of the JCOMM/IODE Ocean Data Standards process (see http://www.oceandatastandards.org), there is now a venue for the submission, vetting and accreditation of community wide standards.

Follow on actions: This will be a continuing activity to respond to new kinds of instruments, new data and new requirements for preserving information.

Comments & progress: *In the development of the VOS BUFR template it looks like we will also address the cross over to IMMA/IMMT formats of ICOADS. DMCG-IV agreed that it was not necessary to submit BUFR templates, and delayed mode VOS formats (IMMT, IMMA), to the standards process.*

Recommendation 4.3.4: JCOMM with partner organizations, including in particular the IODE will develop a strategy and implementation plan to realize the Vision for the MCDS, and address the recommendations from OceanOBS'09 (i.e. CWP from Woodruff *et al*[1]).

Short term actions: Vision and draft Recommendation on MCDS to be submitted to JCOMM-IV, including establishment of a network of WMO-IOC Centres for Marine-meteorological and Oceanograhpic Climate Data (CMOCs). The VOS data-flow will be modernized, and the functions of the RNODC/DB and SOC/DB integrated in the MCDS.

Follow on actions: Other sources of data to be considered. Other centres to consider

1 https://abstracts.congrex.com/scripts/jmevent/abstracts/FCXNL-09A02a-1727870-1-cwp4c18.pdf

applying as CMOCs.

Comments & progress: Vision, draft strategy, and initial implementation plan for the MCDS have been prepared by the MCDS workshop (Hamburg, Dec. 2011). USA for the ICOADS, and China for the NMDIS are planning to submit statements of compliance and commitment for hosting CMOCs.

DMP 5.0: Data Processing

This section treats issues that deal with processing the data. It encompasses all of the data management issues that arise from accepting and processing data into archives. The discussion is divided into subsections and each contains a number of recommendations and actions. The sections below provide a brief summary of the implementation sequence to realize the recommendations.

DMP 5.1: Data Versions

Recommendation 5.1: DMPA needs to consult JCOMM PAs to get a full description of the versioning issue, to develop a strategy to manage versions, and to implement the strategy.

Short term actions: A standards forum was held in early January 2008. Versioning and the related topic of duplicates were not addressed.

: Some work has been done to test a unique data identifier in SOT. A report with recommendations will be written by GTSPP.

Follow on actions: Work on data version control is needed and a practical implementation scheme devised. This likely will also need to consider management of duplicates and near duplicates.

Comments & progress: GTSPP has addressed the issue of duplicates through the use of unique tags. *A report on unique data tagging has been requested to Charles Sun, has been drafted, and the plan is to have it submitted through the Ocean Data Standards process (some details can already be found in the OceanOBS'09 CWP from sun et al[2]). The TT TDC is discussing the possibility of adding a unique ID in BUFR templates, including XBT and VOS*

DMP 5.2: Data Quality

Recommendation 5.2a: DMPA should encourage the development and wide spread implementation of a standard suite of data quality testing procedures.

Short term actions: The standards forum referenced in 5.1 discussed existing data quality standards. Some are close to direct use and authors have been encouraged to submit them to the JCOMM/IODE Standards Process.

: The Marine Climatological Summaries Scheme has made particular progress in establishing common data quality testing procedures. There will be a report from ETMC on their implementation success.

Follow on actions As test procedures are required and developed, they should be encouraged to be submitted through the JCOMM/IODE Standards process to bring them forward to the wider community, and then advocate for acceptance and implementation.

Comments & progress:The Standards Forum arrived at a couple of results where GTSPP, GOSUD and sea level were going to submit their procedures to the Standards Process. This hasn't happened. ***Action: contact Charles, Loic, Lesley Rickards directly or task ETDMP to get on them to provide what they promised.***

2 https://abstracts.congrex.com/scripts/jmevent/abstracts/FCXNL-09A02a-1687794-1-cwp4c14.pdf

: ETMC-III action 2.5.1.8 requested Scott Woodruff to discuss with Sissy Iona the suitability of the report of QC of surface marine data and the feasibility of submitting it to the standards process.

: IOC M&G No. 26 needs to be updated, as well as other related documents form the JCOMM catalogue, and new documentation (e.g. sea level).

A standardization effort is underway as part of the development of the MCDS.

Recommendation 5.2b: DMPA should resolve the differences in how the quality of data is indicated to best serve user needs.

Short term actions: No resolution of this was adopted at the Standards Forum and so this needs to be pursued by DMPA and IODE counterparts.

Follow on actions: Once agreement is reached, a viable implementation plan is needed to ensure all JCOMM data are flagged in the same way.

Comments & progress: The First IODE Workshop on Quality Control of Chemical Oceanographic Data Collections, Feb. 2010, agreed on a 2-level qualify control flag scheme based on quantifiable and subjective tests, and identified this outcome as a proposal to the IODE/JCOMM Ocean Data Standards process. The ETDMP ODS TT needs to address flag scales.

Recommendation 5.2c: JCOMM to work with all appropriate bodies to converge toward more uniform schemes (and ultimately a single scheme) to indicate data quality.

Short term actions: Documentation of existing schemes can begin the process by allowing a small team to consolidate what is done, find commonalities and propose a standard.

Follow on actions: All appropriate groups need to be part of the process and accept the results. One way to do this is to use the JCOMM/IODE Standards Process.

Comments & progress: See 5.2b above.

DMP 5.3: Duplicates

Recommendation 5.3a: DMPA develop a methodology to address how to identify exact and inexact duplicates in contemporary JCOMM data.

Short term actions: This was expected to be covered by the standards forum, but has been postponed from the agenda of the first meeting. There is some experience in duplicates management in some of the JCOMM and IODE programmes and this experience and the suggestions need to be drawn out in a document. DMPA and IODE should collaborate to get this done.

Follow on actions: From the summary of experience a plan of action that covers both a better way to find duplicates in existing data collections and a way to lessen the incidence of duplicates in the assembly of data collections is required.

Comments & progress: This is related to unique data tags. There seem to be two issues at least. The first is what unit of data to attach a tag and secondly to ensure that as data are exchanged, they never move without a unique identifier and receivers preserve them. At IODE-XX it was noted that Cyclical Redundancy Check (CRC) is a good candidate to be used as a tool for producing unique identifiers The issue raised at 2010 IODE officers meeting and requested GTSPP to discuss the matter in their meeting May

2010 and report back to the IODE officers. Also CRC could be a good candidate for submission to Ocean Data Standards Pilot Project.

: A place for a unique identifier is appearing in the new VOS templates, though this may not always be used.

The unique tag issue should be submitted to the ODS. DMCG-IV requested S. Iona to approach Charles Sun in the view to have GTSPP submitting this to the ODS

Recommendation 5.3b: JCOMM consider developing a comprehensive system to uniquely tag data from all of its programmes and employ this to detect data duplications.

Short term actions: There is some experience within the SOT (through the GTSPP) and this needs to be documented and examined for broad application. GTSPP has produced a report of its experience.

Follow on actions: Depending on the effectiveness of existing schemes, improvements may need to be sought and then a careful implementation strategy that allows, if possible, a staged implementation.

Comments & progress: This is related to 5.3a which should be sorted out first.

DMP 5.4: Contents

Recommendation 5.4: JCOMM explore the ideas embedded in xml "bricks" as a standard way to organize and preserve information and data.

Short term actions: Some of these ideas are coming into play in analyzing BUFR templates and will be taken up by the TT-TDC. This is closely tied to standardizing information content in archives.

Follow on actions: Because of the close ties to standardizing content, both of these subjects must be treated together. It will be important to see how well a re-organizing of information in BUFR improves managing the data and how well it is accepted.

Comments & progress: These ideas are appearing the development of the VOS template. How this has progressed can be found in the ETMC-3 meeting report.

: Standardizing content in archives may still be an issue. Some work has been done in this is the idea of xml bricks, but we wider discussion is needed. It is quite premature to propose a standard. Perhaps within IODE a document could be developed by interested people. Action: discuss it with Greg.

DMP 5.5: Processing history

Recommendation 5.5: DMPA explore the value of preserving a processing history and recommend broad adoption if appropriate.

Short term actions: There is some experience in preserving such information in SOT (in the GTSPP) and in Argo. In the short term, documentation of the practice is needed with particular emphasis on the problems that are solved or alleviated by such a practice.

Follow on actions: Once the advantages of preserving such information become known, there will be wider acceptance and a greater likelihood of gaining international recognition as a “best practice”.

Comments & progress: This is similar to 5.4. There is experience in data centres in using history

records. Perhaps someone from one of these can develop a document that eventually would go to the standards process. Broad adoption is needed for a scheme to permit preserving processing history; but it is not clear who might be in a position to make a firm proposal in this regard. This issue also relates to the metadata categories proposed by META-T.

DMP 5.6: Metadata

Recommendation 5.6a: DMPA examine existing metadata initiatives to develop a categorization that aligns with the purpose of the metadata in line with the OceanOBS'09 recommendations (i.e. Snowden *et al* CWP[3]).

Short term actions: Some work on this has been done in the JCOMM E2E project and within some of the DMAC discussions. The WIGOS-PP will increase the exposure of these ideas.

: The European Union Project SeaDataNet has made significant progress in addressing metadata issues. Their results should be examined.

Follow on actions: As WIGOS develops a first version of how to organize some of the information will be in operation. This will allow an evaluation of strengths and weaknesses of this scheme, plus the ability to assess the extension to other kinds of metadata. With experience gained, a submission of a proposal to the standards process should be considered.

Comments & progress: *Within the E2E documents there is some of this present. There are some discussions from IOOS, also there is SDN.* ***Action: Nick or ETDMP simply document what is current practice as the initial step.***

Recommendation 5.6b: DMPA use the metadata categorization to develop a plan in which metadata initiatives align with its work and become engaged in these activities.

Short term actions: The Meta-T project has addressed this issue from the point of view of information required to accompany water temperature data in real-time or in delayed mode. This is a different aspect than used in WIGOS-PP and so broadens the scope.

Follow on actions: As Meta-T gains experience, refinements and extensions to other variables will be needed.

Comments & progress: *There are some potential overlaps with the BUFR VOS work. Perhaps it is best to see how that develops and then to request Meta-T and TT-TDC to cooperate to flesh this out.*

Recommendation 5.6c: JCOMM define its requirements for discovery metadata and embody these in a formal metadata structure.

Short term actions: Work on meteorological and oceanographic ISO profiles has proceeded independently. There are many similarities to the solutions, but some differences as well. In the short term, it is expedient to get the discovery metadata defined and operating within the ISO profiles.

: Greg Reed, author of the oceanographic ISO profile called MCP, represents JCOMM on the WMO committee responsible for the meteorological profile.

: Mapping the Marine Community Profile to the profile used in the WIGOS-PP will be undertaken in that project.

3 https://abstracts.congrex.com/scripts/jmevent/abstracts/FCXNL-09A02a-1745513-1-CWP4C13.pdf

Follow on actions: In the longer term, it seems advantageous to try to unite the ISO profiles in a single form. This will help clients seeking to find data of interest and encourage interoperability.

Comments & progress: *MCP is achieving acceptance as the mechanism for discovery metadata. It is not yet finalized to be submitted as a standard.*

Recommendation 5.6d: JCOMM to encourage all agencies keeping information about instruments, platforms, etc., to place this information on-line and keep it up-to-date.

Short term actions: The Meta-T project is working with the ODAS project in China to get the metadata relevant to water temperature observations on-line and easily searched. It is hoped that this will form the basis for an international system for other variables.

Follow on actions: Meta-T and ODAS are considering how to merge their functions. The merged project will need to broaden its scope of variables and increase its search capability. Of greatest importance will be to develop the facility to keep their information from providers up-to-date.

Comments & progress: *This recommendation goes well beyond the remit of Meta-T and ODAS, but they are a starting point in that they are defining required information content. Action: a report from them with this information content specification as the focus would help.*

Recommendation 5.6e: JCOMM to develop a strategy for managing the international suite of these metadata sources so that they are easily found and used in line with the OceanOBS'09 recommendations.

Short term actions: The ODAS development in China represents the initial work in this domain.

: Work of the WIGOS-PP addresses both discovery metadata and data transport metadata.

Follow on actions: The ODAS development in China represents the initial work in this domain. It seems unlikely that there will ever be a single point of contact for all metadata so some mechanism for finding the many sources will be necessary.

Comments & progress: *This is far from completion though SDN has made progress. What is the way forward on this?*

DMP 5.7: Model Data

Recommendation 5.7a: JCOMM to work with the modelling community to define the characteristics that determine which outputs should be archived.

Short term actions: A new ET has been formed in SPA on Operational Ocean Forecast Systems. The chair of DMCG attended the initial meeting to open a dialogue with this community. A task team has been formed to address data management issues.

Follow on actions: Formulate a plan that is supportable by both the modeling community and managers of the data.

Comments & progress: *This is a good question to pose to Coriolis/Mercator. Through IODE and JCOMM we could ask them to prepare a document that recommends what to be done. This could go to IODE. A better cooperation with the SFSPA is needed and has been addressed since DMCG-IV with*

guidance from the Management Committee. SFSPA suggested that there are two approaches in archiving model output:

(i) Specific field(s) determined by users of model output. For example, an archive of total precipitable water (TPW) from operational weather forecast model is useful for satellite people. They need TPW for their retrieval applications. Therefore, which field to archive is determined by users, not by modelers; and
(ii) Archive of "nowcast" in real time, this is a way of accumulating nowcasts to build a historical record of the (ocean) state. Such record would be very useful for many purposes, from research of variability to diagnose/validate models.

In addition, archival of nowcasts should be coordinated with the availability of periodical "reanalysis", i.e., archive the nowcasts in real time as an extension of the available "reanalysis" until a new reanalysis is produced with a more advanced modeling system. SFSPA does not see much value of archiving model "forecasts".

Recommendation 5.7b: JCOMM to work with relevant modelling groups to develop cost-effective strategies for the storage and archival of operational model outputs and products.

Short term actions: As part of the initial document for archiving model data, there must be a discussion of possible ways to standardize outputs for greater usability.

Follow on actions: Opinions and support from the modeling community will be crucial for any plans to standardize results. The plan must gain this support.

<u>Comments & progress</u>: *Again, advice from Coriolis/Mercator or others may be sought. It is not sure how useful this will be since the usual response is more storage capacity and bandwidth. Perhaps this needs further thought to decide what are the relevant question and answers that will help data centres cope with model outputs. SFSPA doesn't see significant value of archiving operational model "forecasts" (In the sense that the cost would significantly out weigh the benefits).*

Recommendation 5.7c: Appropriate model characteristics will be archived with model results.

Short term actions: It is expected that model results will need to be qualified by sufficient descriptive information about the characteristics of the model so that users can know how to interpret the results. The initial document on archiving model results (see 5.7a) should discuss this and propose a way forward.

Follow on actions: Opinions and support from the modeling community will be crucial for defining the information needed to describe model results. The plan must gain this support.

<u>Comments & progress:</u> *This is a tough question. It is strongly related to 5.7a. How to proceed on this?*

The "model characteristics" here means user manuals, documentations, and validation reports. The recommendation here is to keep these information available with the archive of model output.

DMP 5.8: SOCs and RNODCs

Recommendation 5.8: JCOMM and IODE seek efficiencies in the operations of former SOCs and RNODCs, and integrate these function in the new Marine Climate Data System (MCDS).

Short term actions: Action has started to compare operations of the SOC and RNODC for surface drifters. Both groups will document their operations, compare activities, identify overlaps and formulate appropriate actions to reconcile activities.

Follow on actions: Once agreement has been reached on where streamlining can occur in the operations of SOCs and RNODCs, appropriate steps to re-align operations by the national agencies operating these facilities will be sought.

Comments & progress: *the RNODC for surface drifters (Canada at ISDM) are talking to the French SOC through the DBCP to resolve this one issue. Action: contact Al Wallace as chair of DBCP to ask him if the report is done and to get a copy.*

: Action: Find out how many other overlaps there are (if any) (with the help of Peter and Etienne).

Following guidance from DMCG-IV, ETMC-III, MARCDAT-III, and IODE-21, action has been undertaken to propose better integration of the functions of the RNODC/DB and SOC/DB. An ad hoc Task Team was formed, and recommendations made. It was then proposed to integrate these functions further into the new Marine Climate Data System (MCDS) that is being developed.

DMP 6.0: Access

This section treats issues that deal with accessing data. Access includes being able to find data or information needed, to look through the data to decide that what specifically is wanted is present and, finally, being able to acquire the data and information. The discussion is divided into subsections and each contains a number of recommendations and actions. The sections below provide a brief summary of the implementation sequence to realize the recommendations.

DMP 6.1: Discovery

Recommendation 6.1a: JCOMM pursue the creation of standards for data discovery metadata and encourage these to be used to support interoperable catalogue services and registries.

Short term actions: Both WMO and IOC have developed ISO profiles for their respective organizations. Since JCOMM crosses both domains, we wish to ensure as much commonality between the two as possible. Greg Reed, author of the oceanographic ISO profile, represents JCOMM (and IODE) on the WMO committee responsible for the meteorological profile.

: WIGOS-PP will exploit WIS and IODE infrastructure to support management of the metadata.

Follow on actions: Agreed metadata content and an established infrastructure are only the support tools. It will be important to develop the habit in all of the organizations contributing data and information to JCOMM to create and maintain the metadata records.

Comments & progress: *See comments earlier about MCP.*

Recommendation 6.1b: JCOMM explore how commercial search engines can be used as another way to search catalogues so that users can use Internet tools to locate data.

Short term actions: Commercial search engines are powerful tools that require no support by JCOMM and yet can significantly increase the exposure of JCOMM information. A study is required to determine how the metadata records that are required by JCOMM for its own purposes can be made accessible to commercial search engines.

Follow on actions: If it is determined that with an appropriate level of effort the metadata records of JCOMM can be made accessible to commercial search engines, implementation plans will need to be formulated and carried out.

Comments & progress: *This was a suggestion made by Peter Cornillon at IMDIS2008 meeting. No further action took place to explore this. Perhaps it could be accomplished by placing discovery metadata as documents on a web site somewhere. Then commercial site crawlers will find them and index the contents. How to move on this?*

DMP 6.2: Browse

Recommendation 6.2: JCOMM explore the implementation issues of existing or proposed methods for supporting browse functions.

Short term actions: There are many tools existing and in preparation that permit browsing of data. Some of these are currently being deployed by JCOMM in the context of the WIGOS-PP. The logical direction appears to be to use web services technology.

Follow on actions: JCOMM centres will need to support WIGOS and ODP capabilities, and this will be a focus for implementation.

Comments & progress: *SDN, WIGOS, IOOS, IMOS (Australia) and likely others are doing this. Web services/OGC standards are increasingly important. DMPA needs to watch on these.*

DMP 6.3: Data Delivery

Recommendation 6.3a: Each member state of JCOMM needs to examine its ability and willingness to provide all of its data holdings on-line. Each will determine what level of support it can bring to bear.

Short term actions: JCOMM centres holding data and information have large differences in the ability to place data on-line. At the same time, there are also sensitivities to allowing access to certain data. A poll of JCOMM Members / Member States capabilities and intentions to place data on-line will help clarify what can be done. Some of this information is presently available in national reports from IODE.

Follow on actions: Mutual cooperation and capacity building will be an important aspect to helping Members / Member States place data on-line. A plan for improving what is available on-line is needed taking due consideration of the emerging reality of distributed data systems.

Comments & progress: *The WIGOS project is leading part of the way with ODP. DMPA can encourage ocean data centres through IODE representation to become engaged. On the met side, you are likely going to need to rely on met members of DMPA to help point to appropriate sources.*

Recommendation 6.3b: DMPA must keep aware of other and continuing projects to improve the

access to data and where possible both participate in the projects and adopt procedures that improve access to JCOMM data.

Short term actions: Chair ETMC informed of RECLAIM project to recover information from ship logbooks.

: IODE-20 national reports provide links to data sets.

: 2007 WCRP Task Group on Data Management has a list of project web sites.

: The SeaDataNet project has developed capacity for providing access to data. JCOMM needs to collaborate on work of interest to JCOMM.

Follow on actions: Keeping abreast of these data rescue and access plans in countries will be helpful in promoting cooperation and capacity building.

Comments & progress: *Keeley is responsible for the WCRP report due this coming March or so. As far as the others go, I think it is a matter of encouraging participation and watching.*

Recommendation 6.3c: DMPA encourage the development of a new Marine Climate Data System (MCDS), including the compilation and adoption of a standard climatology, of the creation of specialized archives, and other products that have wide spread applicability to members.

Short term actions: The climatologies developed and circulated through the ICOADS and the WDC-A are an example of what JCOMM needs to continue to support. Likewise, specialized archives, such as started for extreme waves, will be very useful to the wave community. These and others are to be encouraged.

: Argo has developed climatologies directed for use in delayed mode quality control.

: SeaDataNet is pursuing the development of climatologies.

Follow on actions: All JCOMM Members/Member States can provide information on what they are doing with respect to climatologies and specialized data sets. This will help to promote international cooperation and encourage convergence to standardized forms.

: Members/member states with strong interests or capabilities in developing climatologies should collaborate with ETMC.

Comments & progress: *There are lots of climatologies and likely this will continue since they are produced for different purposes and so use different methodologies. It would be nice to get a list of the global ones at least. Perhaps we can ask WDCs to do this for us?* ***Action: discuss it to with Greg****. The work of the ETMC and TT-MCDS regarding the development of a Marine Climate Data System (MCDS), including a network of CMOCs, as part of the modernization of the Marine Climatological Summaries Scheme is taking this recommendation into account.A Vision, draft strategy, and initial implementation plan was proposed for the MCDS. These will be submitted to JCOMM-IV.*

Recommendation 6.3d: JCOMM needs to ensure that all information required for the correct interpretation of data be included when data are delivered to clients.

Short term actions: There is a huge variety of information that is held to describe data collections in JCOMM. A document was prepared and presented at IODE-19 that describes the technical information needed to link to data.

: There are some data type specific documents like those created for IODE from a number of years ago. These need to be revisited and updated as appropriate. This should be part of the Catalogue of Best Practices.

Follow on actions: The specification of required information should be stored in the metadata profiles discussed earlier.

Comments & progress: *This is more of advice to IODE and to appropriate met archives like ICOADS. The definition of what is all the required information has never been written. Some minimum requirements could be compiled.* ***Action: to ask Scott to ponder this and produce a document****. Such a document would be helpful in the Manuals and Guides series of IOC.* ***Action: Greg's advice?***

DMP 7.0: Co-ordination and Linkages

JCOMM operates within a world of many national and international programmes. Because of this, the JCOMM DMPlan treats issues that deal with co-ordination and links with other programmes to improve the overall handling of data and information. The discussion is divided into subsections and each contains recommendations and actions. The sections below provide a brief summary of the implementation sequence to realize the recommendations.

DMP 7.1: Within JCOMM Activities

Recommendation 7.1a: JCOMM develop a formal mechanism to ensure regular exchanges of information and ideas on how data are managed between the groups in OPA, SPA, and DMPA.

Short term actions: Chair DMCG attended OPA and SPA meetings

: Encourage joint projects such as GTSPP, GOSUD

: Encourage linking of existing data systems of PAs to systems such as WIGOS in WMO and Ocean Data Portal in IODE.

Follow on actions: DMPA activities must be closely linked to solutions being worked on in the other PAs.

: DMPA needs to continually reinforce its role of promoting common solutions to common problems, encouraging activities in other PAs to adopt solutions as often as possible and to encourage standardization. The joint JCOMM/IODE Standards Process is a vehicle to use.

Comments & progress: *At the last JCOMM Management meeting, PA chairs asked for time to be set aside for discussions of activities in the respective PAs. The intent was to use this opportunity to discuss cross PA activities ongoing or to start.*

: Past chair tried to attend other PA CG meetings or to invite other coordinators to attend the DMCG meeting. New chair will continue with that.

Recommendation 7.1b: JCOMM must consider interoperability issues with satellite data providers so that satellite and in-situ data are easily compared.

Short term actions: The WIGOS-PP project within JCOMM will involve a satellite data centre in its development activities.

: The experience of the GHRSST Project has some valuable solutions to combining satellite and in-situ data. These need to be explored further.

Follow on actions: Continue discussions with JCOMM representatives of the satellite operators.

Comments & progress: ***Action: question to GHRSST to provide the details of how they do the co-registration of in-situ and satellite****, SFSPA Coordinator could assist on that and prepare such a document. As Task Team on Satellite Data Requirements was formed, focusing on satellite products.*

Recommendation 7.1c: JCOMM should first adopt an existing standard or best practice, as a second option adapt an existing one, or failing that create its own.

Short term actions: A joint IODE, JCOMM meeting to discuss standards was held in January 2008. The result was to adopt a process for evaluating and recommending standards as well as encouraging participants to submit proposals for consideration.

Follow on actions: There are other common practices developed in other international groups and JCOMM needs to be aware of these as well. The compilation of the common practices will be an important contribution.

Comments & progress: *See earlier comments on standards in the document.*

Recommendation 7.1d: JCOMM develop a process to accredit standards to be recommended for use across all activities.

Short term actions: The Standards Forum took place in January 2008. It agreed on a process and a way to implement the standards widely.

Follow on actions: Follow on meetings will be needed to continue the adoption of standards throughout JCOMM.

Comments & progress: *The accreditation process has been built. It needs ETDMP to implement and standards to be proposed. Yutaka is targeted from ETDMP to focus on this standards process.*

Recommendation 7.1e: DMPA develop a plan for coordination of the accreditation process and carrying out of evaluations.

Short term actions: The plan was developed. It is proposed that ETDMP will be the lead group to administer the process and the ToRs have being modified to reflect this. JCOMM-III will be asked to support this.

Follow on actions: Mechanisms for proposing standards and evaluation of proposals will be needed. The ongoing accreditation process will need to produce such a plan.

Comments & progress: *This is finalized (?)*

Recommendation 7.1f: JCOMM establish a highly visible and accessible repository where information about JCOMM standards can be found.

Short term actions: Web sites are being created for the different PAs in JCOMM. However, it will be necessary to provide cross links especially when other PAs refer to standards or best practices they employ.

: The Standards Forum resulted in the creation of the web site – http://www.oceandatastandards.org

Follow on actions: This web site must be kept up to date.

Comments & progress: *Peter is keeping this up to date. So far the main problem is lack of new proposal.*

Recommendation 7.1g: As part of the accreditation process, consideration must be given to how to implement the standard across JCOMM members as rapidly as possible. Due consideration should be given to how capacity building resources may be used.

Short term actions: The Standards Forum suggested JCOMM and IODE meetings can ask Members / Member States to include the standards to which they comply in their national reporting.

Follow on actions: Capacity building can be a very useful mechanism to encourage a more rapid adoption of standards. Inclusion of these in courses should be adopted.

Comments & progress: *One suggestion that Keeley made to Peter was that as standards passed through to recommendations, IODE should ask members to comment on their implementation of those standards when they prepare their national reports. Discussion with Greg and Peter. Issue of recommending the use of adopted standards was discussed at IODE-XXI, and will be discussed at JCOMM-IV.*

Recommendation 7.1h: DMPA establish a reporting process that has members informing the group of significant activities in other programmes.

Short term actions: Communicating what are the various activities in the PAs is an important activity. A number of mechanisms need to be used, including providing information in national reports, polls of Members/Member States, joint projects and personal contacts.

Follow on actions: Reporting of these activities can take the form of activities listed on web pages.

Comments & progress: *Action: DMCG-IV requested the DMPA Coordinator to send out information to JCOMM members about DMPA activities using the JCOMM web site and to seek feedback from them*

Recommendation 7.1i: DMPA set priority activities each intersessional period and use this as the guide to select activities for its members.

Short term actions: Provide a report on progress towards implementing recommendations in the Strategy. The report of the last interssional work will be provided to the new DMPA formed at JCOMM-III.

Follow on actions: Each year, DMCG should update the report with activities accomplished, and changes to reflect new or altered circumstances.

Comments & progress *This is needed for the TDC, Meta-T, standards.*

Recommendation 7.1j: DMPA in collaboration with OPA, and SPA encourage the completion of quarterly reporting of other important variables following the model used by OPA.

Short term actions: There can be no effective reporting until there is an organized collection of the data for the variables in question. OPA and SPA need to examine their activities to see what can and needs to be done.

Follow on actions: Once the problems to be overcome are identified, activities need to take place to enable reporting of other variables.

Comments & progress: *This is something to discuss with Candyce. Right now there are no met variables and perhaps this is an oversight.*

Recommendation 7.1k: DMPA collaborate with appropriate members of OPA, SPA to develop a set of data system performance metrics and implement a standard reporting of these results.

Short term actions: Data systems within the PAs are different because of different origins and requirements. A study in conjunction with OPA, SPA chairs will be required to look for the common elements that can be used across all or most systems.

Follow on actions: The data system managers in the PAs will need to implement regular reporting of performance.

Comments & progress: *Originally this was something along the lines of data flow metrics. ISDM has experience in GTSPP and RNODC activities. Perhaps a discussion between OPA and relevant data centres about what would be most useful could be started. It was also discussed in the 2010 IODE officers meeting. (see report of the meeting, action 2.54). DMCG-IV requested the ETDMP to provide a performance model for ODP.*

DMP 7.2: With IODE Activities

Recommendation 7.2a: IODE and JCOMM formalize the relationship between the organizations. It is suggested that the chair of IODE be named a member of the DMCG and the chair of the DMPA be named an Officer of IODE.

Short term actions: IODE accepted the DMPA chair as an Officer in IODE and IODE Chair is a member of DMCG.

Follow on actions: JCOMM should always be represented at IODE activities and vice versa.

Comments & progress: *This recommendation is done.*

Recommendation 7.2b: Data management programmes of joint interest to both JCOMM and IODE be formally recognized and supported by both organizations.

Short term actions: Initial cooperation is beginning within the WIGOS-PP.

: ETDMP is a joint committee.

Follow on actions: Develop ways that mutual support of this and other programmes can be accomplished.

Comments & progress: *This is well in hand. ETDMP is the main mechanism.*

Recommendation 7.2c: IODE and JCOMM cooperate to ensure easy access and clearly described content of respective data streams and archives.

Short term actions: There are a number of candidate IODE data centres that are taking part in the WIGOS-PP.

: A checklist of requirements to take part in WIGOS has been developed.

Follow on actions: Encouraging cooperation between NMHCs and IODE centres in managing data is an important step to build closer cooperation. This will occur through participation in programmes of mutual interest, such as WIGOS and the switchover of GTS reporting to table driven codes.

Comments & progress: *Encouragement to be part of WIGOS is the way to move forward.*

DMP 7.3: With Other IOC Programmes

Recommendation 7.3a: JCOMM and DMPA move quickly to adopt a data management strategy and to further develop an implementation plan based on the strategy as rapidly as possible.

Short term actions: Completed and published the first version of the data management strategy.

: A report of implementation progress will be provided to the new DMPA from JCOMM-III.

Follow on actions: Review the Strategy between JCOMM-III and IV especially taking into consideration the results of the OceanObs'09 meeting.

Comments & progress: *The strategy was adopted. There is now the implementation. The GCOS Implementation Plan has listed expectations of JCOMM and DMPA. Reviewing this will help to set priorities.*

Recommendation 7.3b: JCOMM must work closely with the many other IOC programs in developing its implementation plans.

Short term actions: Collaborated with IOC in the generation of their data strategy.

Follow on actions: Ensure that IOC and others are aware of and contribute ideas towards changes in the strategy and updates to the implementation plan as appropriate.

Comments & progress: *Peter is very helpful on keeping IODE members informed about what is going on. This will help me to watch and provide my opinion when I think I should. Any other specific suggestion from Peter?*

Recommendation 7.3c: JCOMM should collaborate with existing IOC (and WMO) capacity building activities to ensure that the marine component is included.

Short term actions: JCOMM has contributed to courses offered that promote capacity building.

: WIGOS-PP will support travel of experts to contributing data centres.

Follow on actions: Provide training materials and experts as possible to support training activities.

Comments & progress: *Not much progress here.* ***Action: submission of the current cookbook to OceanTeacher. Also check if the best practices material is included.*** *Etienne may also be able to help with the WMO side.*

DMP 7.4: With WMO

Recommendation 7.4a: DMPA and WIS should cooperate to ensure that all components of JCOMM data systems are available to WIS.

Short term actions: IODE and JCOMM are cooperating in the WIGOS-PP.

Follow on actions: DMPA to encourage IODE centres to contribute to WIS by providing information about what they need to do and what benefits they will gain from the activity.

Comments & progress: *This is in hand with the WIGOS project. Encouragement/push data centres to contribute.*

Recommendation 7.4b: DMPA ensure appropriate experts are fully engaged in appropriate WMO activities.

Short term actions: Work with WMO on the Quality Management Framework to include information of relevance to JCOMM.

: Collaboration on data exchange formats is being furthered through ET-ADRS and TT-TDC.

Follow on actions: As appropriate, combine IODE and JCOMM documentation and materials. Provide experts as needed to WMO meetings and activities.

Comments & progress: Etienne was already very helpful here.

DMP 7.5: With ICSU WDCs

Recommendation 7.5a: DMPA initiate a discussion with WDCs to build stronger links between the observing and archive systems and how WDCs operate. This should be done with appropriate other partners.

Short term actions: A discussion with WDCs will take place at IODE-XX with representation of JCOMM. This will set the stage for a tighter definition of roles and responsibilities of each.

Follow on actions: Continue the discussion with WDCs to ensure good coordination of activities.

Comments & progress: The new roles of WDCs and IODE within WDS should be taken into consideration. DMCG-IV proposed that the IODE nominates itself as a World Data System (WDS).

Recommendation 7.5b: JCOMM members support the timely assembly of data in WDCs and encourage timely updates and distribution of the global data sets and climatologies.

Short term actions: Identify the target climatologies and encourage all JCOMM programmes to contribute data in a timely way. This was done at IODE-19.

: IODE-20 will continue the discussion and extend it into other areas.

Follow on actions: Ensure that timely delivery is maintained and that there is consistency in the data.

Comments & progress: to handle it with IODE.

DMP 7.6: With Other Programmes

Recommendation 7.6: JCOMM must develop a level of interoperability in data management with other major international and significant national programmes.

Short term actions: It is not possible for a coordinated JCOMM response to all initiatives. Focus energies on cooperation with WIS.

: Connections to national programmes such as the U.S. DMAC and the E.U. SeaDataNet will be needed.

Follow on actions: Select activities that provide the greatest impact.

Comments & progress: JCOMM through IOC/IODE has built close cooperation with the EU/SeaDataNet Project relatively to:

- *the Ocean Data Standard Process*
- *interoperability between Ocean Data Portal and SeaDataNet*
- *training material to Ocean Teacher web tool*

DMP 8.0: Communications

Communicating activities undertaken and accomplished by JCOMM is important. It informs our partners about what we are doing and improves opportunities for cooperation. The text below provides a brief summary of the implementation sequence to realize the recommendations.

Recommendation 8a: DMPA undertake to design and populate web pages that explain its activities.

Short term actions: A basic DMPA web site is completed.

: Content should be reviewed annually.

Follow on actions: Solicit input from DMPA members to add to the web pages. As appropriate, collaborate with groups (such as IODE) who have similar requirements.

Comments & progress: The present pages need review to be sure it is up to date. (e.g. Metadata, Education and Training links are empty, missing icons in the left menu list below DM, the TT-DMVOS link needs login to enter?). DMCG-IV agreed that the JCOMM web site needed to be updated, including populating some pages where information is missing, reducing text where appropriate to make the site more attractive and clear. The Group noted that the ETMC web site could possibly be moved to the JCOMM web site.

Recommendation 8b: DMPA will provide its representatives (and encourage the necessary national and international support) to attend meetings of other organizations and committees whose interests intersect.

Short term actions: The organization of CLIMAR-III was undertaken by ETMC and supported by DMPA. The meeting was held in May 2008 in Poland.

Follow on actions: It is proposed that JCOMM support MARCDAT-III and CLIMAR-IV

: Assist or attend other meetings as appropriate.

Comments & progress: ETMC is handling the CLIMAR/MARCDAT meetings. JCOMM was represented in OceanObs'09, IMDIS2010 Conference. Peter is doing very god in forwarding notices for relevant events and JCOMM should attend if needed.

Glossary of Acronyms

Acronym	Meaning
BUFR	Binary Universal Format for data Representation
CBS	Commission on Basic Systems
CF	Climate and Forecast (conventions)
CREX	Character Form for the Representation and Exchange of Data
DMAC	Data Management And Communications (committee)
DMCG	Data Management Coordination Group
DMPA	Data Management Programme Area
ET-ADRS	Expert Team on Assessment of Data Representation Systems
ETDMP	Expert Team on data Management Practices
ET-DRC	Expert Team on Data Representation and Codes
ETMC	Expert Team on Marine Climatology
E2E	End to End
GHRSST	GODAE High Resolution Sea Surface Temperature
GODAE	Global Ocean Data Assimilation Experiment
GOSUD	Global Ocean Surface Underway Data project
GTS	Global Telecommunications System
GTSPP	Global Temperature Salinity Profile Project
HMEI	Hydro-Meteorological Equipment Industry
ICOADS	International Comprehensive Ocean-Atmosphere Data Set
ICSU	International Council for Science
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and information Exchange committee
ISO	International Standards Organization
JCOMM	Joint Commission on Oceanography and Marine Meteorology
JCOMMOPS	JCOMM in situ Observing Platform Support Centre
MT0	Master Table 0
MT10	Master Table 10
netCDF	net Common Data Format
NMHC	National Meteorological and Hydrological Centre
NODC	National Oceanographic Data Centre
OCG	Observations Coordination Group
ODAS	Ocean Data Acquisition Systems
ODP	Ocean Data Portal
OOPC	Ocean Observations Panel on Climate

OPA	Observations Programme Area
PA	Programme Area
RECLAIM	RECovery of Logbooks And International Marine data project
RNODC	Responsible National Oceanographic Data Centre
SDN	SeaDataNet
SOC	Specialized Oceanographic Centre
SOT	Ship Observations Team
SPA	Services Programme Area
ToRs	Terms of Reference
TT-TDC	Task Team on Table Driven Codes
WCRP	World Climate Research Programme
WDC	World Data Centre
WIGOS-PP	WMO Integrated Global Observing System Pilot Project
WIS	WMO Information System
WMO	World Meteorological Organization