INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

WORLD METEOROLOGICAL ORGANIZATION

JOINT TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)

DATA MANAGEMENT PROGRAMME AREA COORDINATION GROUP (DMCG)

First Session
Paris, France, 22 to 25 May 2002

SUMMARY REPORT

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ANNEXES

1. ORGANIZATION OF THE SESSION

1.1 OPENING OF THE SESSION

1 The first session of the JCOMM Data Management Coordination Group (DMCG) of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was opened by the group chairperson, Prof Shaohua Lin, on 22 May 2002 at 09.30 at UNESCO headquarters in Paris. Prof. Lin welcomed the participants in the meeting and called Mr Yves Tréglos, of the joint JCOMM Secretariat, to address the meeting.

2 On behalf of the Executive Secretary IOC, Dr Patricio Bernal, and the Secretary-General of WMO, Prof Godwin Obasi, Mr Tréglos welcomed the participants to the meeting, to UNESCO and to Paris. In so doing, Mr Tréglos emphasized that, since its inception, JCOMM had always stressed that an end-to-end integrated data management system is central to any observational programme. Every subsequent JCOMM meetings, as well as most science planning meetings, national or international, have identified integrated data management as an area requiring considerable planning and effort. One of the key objectives of the present session of the Data Management Coordination Group was therefore to develop a strategy and pilot projects to facilitate the implementation of JCOMM observational programmes as fully integrated end-to-end systems. He concluded by assuring the participants full and ongoing support of the JCOMM Secretariat, both during the present meeting and throughout the intersessional period. He then wished participants a very successful meeting, and an enjoyable stay in Paris.

3 The list of participants is attached as *Annex I*

1.2 ADOPTION OF THE AGENDA

4 The group adopted the agenda for the session on as given in *Annex II*.

1.3 WORKING ARRANGEMENTS

5 The group agreed its hours of work and other practical session arrangements. The Secretariat introduced the documentation for the session.

2. REVIEW OF JCOMM DECISIONS AND PLANS RELEVANT TO THE WORK OF THE DMPA

Report of the Secretariat

6 The group recalled that JCOMM was formally established in 1999 by the thirteenth World Meteorological Congress and the twentieth session of the IOC Assembly, through a merger of the WMO Commission for Marine Meteorology (CMM) and the Joint IOC/WMO Committee for IGOSS. JCOMM is the reporting and coordinating mechanism for all operational marine activities in both WMO and IOC. As such, it is charged with the international coordination, regulation and management of an integrated, operational, marine observing, data management and services system which will eventually become the ocean equivalent of the World Weather Watch.

7 The first session of JCOMM took place in Akureyri, Iceland, from 19 to 29 June 2001. The session was attended by 113 participants from 42 Members/Member States and 11 international organizations. A summary of the main results of the session of relevance to the DMPA is given in *Annex III*.

8 The group was informed that the JCOMM Management Committee had held its first session (MAN-I) in Geneva from 6-9 February 2002. Among the many issues addressed, those of interest to the DMCG included:

(i) A thorough review of the Programme Area work plans and implementation strategies;

(ii) The appointment of Prof. Lin Shaohua as Data Management Programme Area Coordinator, as a replacement of Dr Wang Hong;

(iii) The appointment of Dr Hiroshi Kawamura as satellite rapporteur and Dr Tony Knapp, co-chair of the GOOS Coastal Ocean Observations Panel (COOP) as rapporteur on non-physical variables and JCOMM;

(iv) A decision that stronger emphasis should be placed in the DMCG Work Programme on the development of a JCOMM Data Management Strategy

(v) A recommendation that a Draft Resolution be prepared for the next session for IOC EC calling for the development of an IOC integrated data management strategy.

(vi) Development of an information sheet for JCOMM, containing the vision and key elements of JCOMM and its Programme Areas, which might also eventually form the basis for a JCOMM promotional brochure.

9 The group noted all these developments with interest, and agreed that they provided an appropriate framework and overall objectives for its own work, both during the present session and in the future.

10 The group further noted with appreciation the various actions taken by the JCOMM Secretariat in support of the Commission, and in particular the Data Management Programme Area, since JCOMM-I. Members of the group were urged to:

(i) Visit the UN Atlas of the Oceans (http://www.oceansatlas.org/) once it was formally opened to the public on 5 June 2002, and offer comments and suggestions as appropriate regarding its enhancement within the context of JCOMM and its work;

(ii) Also visit the new JCOMM web portal currently being hosted by IOC (http://www.jcomm.net/), provide comments and suggestions as appropriate, and also make use of the portal as a means for information exchange in support of JCOMM;

(iii) Provide the Secretariat with suggestions regarding a JCOMM logo. (**Action**: group members and Secretariat; **deadline**: as soon as possible)

Actions for the Data Management Coordination Group coming from other JCOMM Programme Areas

11 The group noted that the following actions for the DMCG had come from he first session of the Ship Observations Team (SOT-I) (Goa, India, February- March 2002) and the first session of the Observations Coordination Group (OCG-I) (La Jolla, USA, April 2002). The proposed actions are discussed in detail under the relevant agenda items.

SOT-I

1. Address the question of data quality documentation and assurance, together with the Observations Coordination Group;

2. Review all existing data management plans regarding ship data, and if possible suggest ways of integrating these;

3. Initiate discussion on how to manage non-physical data, such as pCO2, which will eventually be available from VOS, as well as work on entraining the large numbers of existing data centres dealing with ship data into the JCOMM process.

OCG-I

1. Together with OPA component team chairs, address the overall observational data requirements, once these data requirements have been reviewed and updated;

2. Facilitate distribution of wave and related data on the GTS and address issues relating to codes and formats;

3. Collaborate with the JCOMMOPS Coordinator in further developing the JCOMMOPS with regard to data buoys and the VOS.

12 The group agreed that these requirements coming from other Programme Areas, as well as action items addressed from JCOMM-I, should be reflected in work plans for the group and the two Expert Teams.

JCOMMOPS

13 The group was presented with a brief report on JCOMMOPS (more information at the URL http://www.jcommops.org/).

14 The group agreed that JCOMMOPS had a potentially very valuable role to play in the JCOMM integration process, in providing a single source of integrated information on the status of the overall system. JCOMMOPS could also act as a single portal to a range of distributed information and data centres related to SOT, such as the VOSClim Data Assembly Centre (DAC) and the WMO ship catalogue. The group noted with interest that the JCOMM Ship Observations Team, at its first session (SOT-I) (Goa, India, February-March 2002), established a small Task Team on JCOMMOPS to develop an implementation plan for the Centre and that this plan should eventually be reviewed by the JCOMM Management Committee at its second session in early 2003.

15 The group recognized that while JCOMMOPS supported observation programmes, it could also play an important role in JCOMM Data Management Programme Area through its activities, including data monitoring support. It therefore agreed that the Data Management Coordination Group should be involved in the review of the planned development of JCOMMOPS (**Action**: chairs of DMCG, ETDMP and ETMC; **deadline**: as needed). In doing so, the group noted that while the support provided by JCOMMOPS as a data monitoring system was basically on a real-time data basis; since a number of data are managed on a delayed mode basis, the relationship between JCOMMOPS and IODE should also be taken into consideration in the review process of the future development of JCOMMOPS.

Terms of reference

16 The group reviewed the terms of reference of the DMCG and the two Expert Teams of the DMPA as adopted by JCOMM-I. It noted that JCOMM-I also designated most members of those bodies, with the exception of the Expert Team on Data Management Practices. As the terms of reference of the Expert Team on Data Management Practices were quite different from those of the Expert Team on Ocean Data Management which was proposed prior to the session, JCOMM-I decided that the nomination of potential members of the ETDMP should once more be invited. Based on the nominations by Members/Member States, MAN-I appointed eight out of nine members of this team. MAN-I further agreed that the remaining member should be someone with broad science expertise, preferably in a non-physical marine science, a keen interest in data management, and with strong on-going contacts with the scientific community. That position has not yet been filled.

17 To facilitate this appointment, members of the group was requested to nominate candidates for this position and to submit their CV's, as well as a confirmation of willingness to serve, to the Secretariat by the end of June. The group noted the importance of cross-cutting expertise for the vacant position and that membership of the IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GE-BCDMEP) could be used as a source to consider such

nominations. The list of candidates would then be circulated to the Management Committee members for review and eventual decision regarding an appointment.

International Oceanographic Data and Information Exchange (IODE)

18 In this context, the group recalled that the IOC Committee on International Oceanographic Data and Information Exchange (IODE) had established a Steering Group on End-to-End Data Management Systems, which was tasked to develop "*end-to-end data management systems for the collection and management of data sets required to support the variety of requirements including the Global Ocean Observing System*". The Steering Group had not been activated as yet. Given the similarity of the terms of reference of that Steering Group and those of the JCOMM Expert Team on Data Management Practices, the group recommended that IODE be invited to co-sponsor the latter instead of establishing and activating a new body (**action**: Management Committee for approval, then joint Secretariat; **deadline**: next IODE session).

Work plans: Report of the chairs

19 The group noted with appreciation a report by Prof. Shaohua Lin, chairperson of the group, on her activities in support of the work of the group and of the implementation of the Data Management Programme Area work plan generally. This report specifically addressed the priority issues to be covered during the present session. A summary of this report is given in *Annex IV*.

20 Dr. Miroslaw Mietus, chair of the ETMC, informed the group that a detailed work plan for his team was drafted and circulated among the members of the team. A revised version was presently being developed and the team would start actions based on the work plan. He stressed that identifying concrete action items was important to implement tasks addressed to the team. The group noted that it is important that the ETMC should cooperate with the ETDMP.

21 Dr. Nikolai Mikhailov, chair of the ETDMP, informed the group that he had developed a short-term work plan for his team, which was presented to MAN-I. However, concrete work had not yet started. Dr Mikhailov emphasised that the DMCG should provide a vision of and framework for the integrated end-to-end data management process of JCOMM, based on which detailed actions of the ETDMP could be developed.

22 The group agreed that the development of guidance to end-to-end data management was a real challenge and one of the most demanding tasks for the DMCG. In this regard, the group noted that MAN-I had decided to prepare a concise summary document of the vision and strategy for JCOMM (see paragraph 8 (vi) above), as a first step in addressing integration and cross-cutting issues, and in developing an overall strategic plan for JCOMM. The summary concerning the Data Management Programme Area was in the process of being prepared by the DMPA Coordinator.

23 At the same time, the group noted that the development of concrete work plans including concrete action items and target were also important to implement tasks in the DMPA. The group noted some of the action items included in the work plans by JCOMM-I had already been completed and/or well addressed. It agreed that a revised version of detailed work plans should be made based on actions taken and outcomes of this meeting (see agenda item 7).

3. REVIEW OF EXISTING AND PLANNED DATA MANAGEMENT MECHANISMS AND PRACTICES

3.1 MARINE CLIMATOLOGICAL SUMMARIES SCHEME (MCSS)

24 The group noted with interest and appreciation the report on the history and developments of the Marine Climatological Summaries Scheme (MCSS) presented by the chair ETMC. It agreed that the data collected under the MCSS have proven invaluable over the years. In addition to operational meteorology and services for marine users, the data are used in global climate studies and in

calibrating algorithms used for sea surface temperature and other measurements from satellites. Detailed activities within the current MCSS were also reported.

25 The group noted that there was increasing interest in global marine climatological data due to global warming and intensification of investigations concerning the role of the ocean in global processes. Intensification of efforts to digitize marine meteorological observations made before 1960 was highly recommended by the marine climatological research community, while the accompanying metadata also represented an important issue.

26 The roles of national services operating VOS (Contributing Members), of the Global Collecting Centres (GCCs) and of the Responsible Members were highlighted with regard to data management. The group stressed that the accuracy of data was of primary importance for the MCSS and scientific research. It was important that marine climatological data were quality controlled before they were exchanged. To ensure the quality of the marine climatological database, Contributing Members applied Minimum Quality Control Standards before dispatching data to GCCs. The group was informed on the activity of GCCs operated by Germany and U.K. for the MCSS during the last eight years, since their implementation in 1994. Data from Contributing Members were submitted every month, and were dispatched quarterly to the Responsible Members, once their quality had been checked. Details of GCCs activity were presented on the basis of their annual report within year 2001.

27 The group agreed that MCSS is an important and highly developed system of marine meteorological data management with a distributed structure. However, there is a lack of a so called "route map" for users looking for data and assistance. This element was considered as very important and to be implemented as soon as possible (**action**: ETMC; **deadline**: as soon as posiible).

28 The group noted that, according to a survey by the GCC of Germany, a large number of ship observations were exchanged only either on a real-time basis (GTS) or on a delayed mode basis (logbooks), while overlap of the whole data set is of about 40%. It noted that assembling both real-time and delayed mode data should be part of the end-to-end data management system to be developed by the DMPA. The group recommended that ETMC investigate the feasibility of including both real-time and delayed-mode data, taking into account of the possible difference in data quality between these two data streams (**action**: ETMC; **deadline**: as soon as possible).

29 The group noted that the terms of reference of the ETMC necessitated other actions in addition to those related to the MCSS, and in particular requested it to investigate the feasibility of including oceanographic climatology into its work plan. (**action**: ETMC; **deadline**: continuous).

VOSClim data management

30 The group was briefly informed of the VOS Climate (VOSClim) project and its data management. The VOSClim project was initiated in 1999, based on recommendations by the VOS Special Observing Project - North Atlantic, which had demonstrated the potential value of VOS observations to global climate studies. A target of 200 ships to participate in the project has been fixed.

31 Participating ships were requested to report a number of observational elements which were essential to the success of the project, in addition to those required from the "classical" VOSs,. However, because of the CBS goal of converting all the alphanumeric codes to table driven codes (i.e. CREX, BUFR, and GRIB), it was decided that the existing (unmodified) ship code should be retained for real time reporting and that the additional observation information should be provided in delayed mode only, in the modified IMMT-2 code format. The additional information would therefore be recorded onboard ships as hard copies or electronic logbooks, for future collection, processing, archival and delivery to users.

32 For the purpose of data monitoring and collection, it was agreed to establish a Real Time Monitoring Centre (located at the Met Office, UK) and a Data Assembly Centre (located at NCDC/NOAA, USA). The RTMC would provide monthly monitoring statistics together with lists of

ships having "suspect" observations. In addition, the RTMC would compile datasets of the observations from project ships and associated model field values with regard to six variables, namely wind direction and speed, sea level pressure, SST, air temperature and humidity. These datasets would be transferred from the RTMC to the DAC in BUFR code. In addition to the real time data, the DAC would also receive the delayed mode data from project ships which would be forwarded through the Global Collection Centres. The DAC would then compile a complete project data set which would be made available to users through the project web site (http://www.ncdc.noaa.gov/VOSClim-html).

33 The group noted that the VOSClim project was expected to be continued and to become an operational programme. It noted that the data management system for the project included a feedback process from data users, through the activities of the RTMC, which it is a good example of end-to-end data management of marine meteorological data.

3.2 SPECIALIZED OCEANOGRAPHIC CENTRES (SOCs)

34 The group recalled that the system of Specialized Oceanographic Centres (SOCs) had been established by IGOSS and thus became part of JCOMM when the latter was formed. Because of the broader mandate of JCOMM as compared to that of IGOSS, it was felt necessary to review the status, ToRs and activities of the SOCs as a first step towards aligning them to meet JCOMM requirements. To that end, the Management Committee established a small *ad hoc* drafting group, tasked with studying the SOCs system. To assist this group, it was agreed that each Management Committee member concerned would provide information, on request, about the status of any existing SOCs within his/her region. The *ad hoc* drafting group was to endeavour to provide (a) proposal(s) to DMCG-I.

35 To assist in this review, a questionnaire was devised to be completed by existing SOCs. Up to the present time, only one response to the questionnaire had been received. It had therefore not been possible for the *ad hoc* drafting group to provide the DMCG with any kind of concrete proposal.

36 The group agreed that such a review was important and expressed its interest to be informed of its results. It further recommended that possible national funding for SOCs as such be taken into consideration when a final decision regarding the SOCs system would have to be taken.

3.3 GLOBAL TEMPERATURE AND SALINITY PROFILE PROGRAMME (GTSPP)

37 The group was presented with an up-date on the GTSPP, which continued to be an active program with contributions from Australia, Canada, France, Germany, Japan, and U.S.A. It operated the data system for the SOOP and included the handling of both real-time BATHY and TESAC data and higher resolution, delayed mode data. It performed acquisition, processing, quality control, archiving and data dissemination functions in cooperation with three science centres in Australia and the U.S.

38 Current GTSPP activities included the following.

- A new web site at www.gtspp.org;
- A strategy to improve the identification of near and exact copies of data;
- Preparation of a new Project Plan;
- Contributing to the production of the final WOCE Data Set to be released on DVDs in November, 2002;
- Plans to issue a stand alone CD (or DVD) in the 2004-5 time frame;
- Ideas for the content for this CD are being formulated;
- Encouraging IODE to address the upgrade of global archives to handle corrections to XBT fall rates;
- Begin annual reporting starting with the first report to cover 2002 and issued in early 2003;
- NODC and IFREMER to begin planning a distributed archive for GTSPP.

3.4 PILOT PROJECT ON SURFACE SALINITY DATA MANAGEMENT

39 The group was presented with an up-date on the pilot project, the initial objective of which was to organise surface salinity data that were currently collected and to work with data collectors to improve data collection in order to meet the benchmarks of spatial and temporal sampling and data accuracies set out by the OOPC. The first meeting of interested participants took place in Brest in November of 2001 with representatives from Canada, France, Greece, ICES, Japan, Russia, UK, and USA. The meeting decided that dealing with only SS was not sufficient, and broadened its interests to include other underway measurements. It concluded with three working groups being formed to draft sections of the project plan.

40 At JCOMM-I, the surface salinity group was urged to look closely at including other variables collected by underway instrumentation. At SOT-I, a presentation by groups making underway pCO2 measurements showed that they were well along in standardizing the instrumentation and had a system ready for routine deployment. It would be beneficial if this Surface Salinity project could make contacts with the CO2 group and exchange ideas about how they might cooperate.

41 Thierry Delcroix of France agreed to chair the Project. A meeting was planned from16-17 September 2002 in Ottawa to review the draft project plan and discuss further action.

3.5 ARGO DATA MANAGEMENT

42 The group was presented with the status of the Argo data system, which was a distributed operation. In most cases, individual countries managed the data stream from the floats they have deployed. Data would be relayed from the centres to the GTS and to two global servers, GDACs, operated by France and the US. Data would be available either from the GTS in TESAC code form, or through either ftp or www access from the GDACs. As the data passed through higher quality control assessments, the data on the GDACs would be replaced by the higher quality versions. A long term archive had been established at the US NODC to ensure the accessibility of the data over time.

43 Most countries had established centres for their data or were collaborating with other countries or Service Argos to share resources. The two global centres acted as mirror sites. The data found at the global centres presently derived from the GTS to cover the period until individual national centres were able to process their data and deliver them in the agreed format. This should start operations soon. The formation of regional centres was still under development.

44 Current activities regarding Argo data management included:

- the completion of initial versions of an Argo documentation;
- operationalizing the exchange of real-time and delayed mode data with the global centres;
- evaluating real-time and delayed mode quality control procedures;
- establishing regional data centres;
- developing a suite of products to demonstrate the use of Argo data;
- ensuring the AIC (http://argo.jcommops.org/) meets Argo needs;
- establish the functions required of the long term archive.

45 A second meeting was planned for Ottawa from 18-20 September 2002 and hosted by MEDS. Work would continue on implementing the various components of the data system.

3.6 USE OF NEW TECHNIQUES FOR REAL-TIME DATA EXCHANGE

46 The group noted that information and communication technology, including data-communication network services and the Internet, has continued its rapid advance. The use of Internet, implemented with adequate protection and security measures, is now recognized as an acceptable and cost-effective option for GTS links as well as for complementary data links and, in fact, several significant links of the GTS are now implemented over the Internet. The use of Virtual Private Networks (VPN), with the Internet Protocol Security (IPSec), appears to provide adequate security and

protection. The group noted that CBS was currently developing guidelines for the implementation of Internet based links, in particular VPNs, as part of the GTS.

47 The group recalled that JCOMM-I requested the DMCG to ensure an appropriate JCOMM participation in the CBS activities related to data exchange. It noted that CBS, within its Open Programme Area Group on Information Systems and Services, established a number of bodies at its twelfth session (Geneva, November - December 2000). Among those, JCOMM is invited to be represented on the Expert Team on Data Representation and Codes, the Expert Team on Migration to Table-Driven Code Forms, the Expert Team on Integrated Data Management and the Inter-programme Task Team on Future WMO Information Systems. The group recognized that the work of all these teams was directly relevant to the DMPA, and that it was therefore important for JCOMM to interact closely with CBS on the issues being addressed by the teams (see item 5.2 for relevant action).

3.7 FUTURE WMO INFORMATION SYSTEM

48 The group noted with interest the development of the Future WMO Information System (FWIS). CBS had established an inter-programme task team to define a vision for the FWIS. The latest version of this vision, which has been endorsed by CBS and EC-LIII, is given in *Annex V*. The team was still refining that vision and presently overseeing trials to evaluate technology and techniques that could be used in its implementation. If FWIS was to serve the needs of all WMO and related programmes, it would be essential that these programmes be represented on the team.

49 The group recognized the importance of FWIS and agreed that the JCOMM should participate in the review process of FWIS. Nomination of the JCOMM representative is discussed under agenda item 5.2.

3.8 OTHERS

3.8.1 The Global Observing Systems Information Centre (GOSIC)

50 The group recalled that the G3OS [the three Global Observing Systems, GCOS, GOOS and GTOS] data and information management was achieved using a highly distributed system of operational centres, data centres, and scientific organizations. The GOSIC philosophy is that, to the extent practical, data, data products, and information are prepared and maintained in the G3OS centres and GOSIC provides road maps and links to them. GOSIC also provides links to the G3OS planning and design documents wherever they may be held. The philosophy is also to minimize the difficulties of navigating complex and vastly different organization web sites by asking the centres to maintain an agreed, simple, common-format web page that points directly to their G3OS data, information, and services. GOSIC then provides the link to that page.

51 The group noted that similar systems had been developed within the meteorological community (see item 6.1 - Existing oceanographic and marine meteorological data holdings). It recognized that, in the short term, GOSIC-like systems were a good solution to assist users in finding the data they needed. On the other hand, solutions for the longer term, avoiding the necessity for centres to register to a central facility, were already under study and might be used in future for JCOMM data management purposes.

3.8.2 An Ocean Information Technology (OIT) project

52 The group was presented with an OIT project, which stressed that advances in oceanography, marine science and technology and marine climatology have led to a rapid expansion in the volume of data and information exchanged, to the point that further progress in managing and interpreting this information was reaching a limit. In addition, users increasingly demanded operational services and products. To serve these requirements, up-to-date systems, methods and technologies for data management were essential. Whereas many initiatives had been developed and implemented in both the oceanography and climatology communities, little or no cooperation or technology transfer had taken place between these communities, nor between these and others (such as the private sector).

Facing the challenges imposed by the expansion of data flow both in terms of data type and quantity will required a leap forward looking beyond traditional methods and structures.

53 To respond to these challenges, the development of an OIT project was proposed. OIT aimed at creating an efficient and effective data and information management system for the marine environment, based on leading-edge [ocean] information technology, and at serving the oceanographic community and beyond. The project should include the following components: (i) telecommunications and telemetry; (ii) standards for data representation and exchange and protocols; (iii) datum and data set integrity; (iv) data circulation and service; (v) data and products servers; (vi) data assembly, quality control; and (vii) the user interface. The project would be initiated as a pilot project, divided into a number of well-defined work packages, to be implemented in parallel.

54 The group expressed its appreciation for the proposal, stating that it constituted an excellent framework for the priorities of the DMCG. It was noted that, for several of the components, IOC and WMO had already initiated activities, and that the project would be able to bring together the expertise and know-how coming from these initiatives. In addition, several regional projects were mentioned that should also be linked to, or integrated into the Project.

55 The group stressed the need to ensure that all Members/Member States should be able to benefit from the developed system that would rely on very advanced information and data management technologies. In this regard the group called for close cooperation with the JCOMM Capacity Building Programme Area.

56 The group approved the Ocean Information Technology Project proposal as a relevant initiative within the framework of the JCOMM Data Management Programme Area and identified four components to be developed as "pilots" (work packages) for discussion during the first session of the OIT Steering Team, planned to take place from 27-29 November 2002 in Brussels (subsequent to the Conference on Colour of Ocean Data), as follows:

1. *Common protocols* - To examine and test protocols for metadata standards, such as data set integrity, archive longevity and practices directly connected to data. To demonstrate one solution to integrating data from diverse sources that will stand up to the test of understanding the data 50 years from today.
   Leader - to be determined by co-presidents of JCOMM in collaboration with PA coordinators.

2. *Data serving* - To examine and demonstrate one solution to product and data servers by examining the technology available ranging over such solutions as DODS, to object request systems. To test solutions for "pushing" data to users, meeting requests for "directory level" information, and identification of different "levels of processing" of data.
   Leader - Chair ETDMP

3. *Data standards for XML and study of relevant technology* - To work closely with ICES, IODE and CBS to explore and test XML for data exchange, to examine open GIS and US Navy uses of XML, to examine WMO experience and requirements and to collaborate in the definition of IOC/ICES XML "bricks".
   Leader - Chair ETDMP or alternate

4. *Technology study* - To carry out a study of relevant modern telecommunications and computer technology in order to evaluate its applicability and impact if adopted by the data system.
   Leader - Bruce Sumner

Each project leader would work with the members proposed to be part of the pilot, to refine the focus of the pilots and to have proposals with clear goals, members and milestones for the works, for review by the Management Committee and for subsequent presentation to the OIT Steering Team by November, 2002.

3.8.3 Sea ice data management

57 The group noted that the JCOMM Expert Team on Sea Ice (ETSI) was currently focussing on sea ice data management issue, as well as services, including a revision of the WMO Sea-Ice nomenclature, development of the WMO Sea Ice Nomenclature in XML format, development of new standards for sea ice charts, new formats for operational and historical sea ice data exchange and colour coding. It also noted that the WMO project "Global Digital Sea Ice Data Bank (GDSIDB)" provided QC and software enhancement for archived data in support of climate oriented programmes and had a plan to access a number of additional sea ice data sets to be digitized . The ETSI, together with the steering group for the GDSIDB, was making efforts to develop blended sea ice variables for global climate reanalysis and to prepare historical sea ice data information for the Southern Ocean.

58 The group noted that there were various types of sea ice data in existence, which the ETSI was dealing with. The group agreed that the DMPA should take advantage of the experience of the ETSI on the integration of different types of data when the DMCG and ETDMP address the integration issue (**action**: ETDMP, ETMC; **deadline**: continuous).

4. REQUIREMENTS FOR END-TO-END DATA MANAGEMENT

4.1 GCOS AND MMS REQUIREMENTS

59 The group noted with interest a report on GCOS and Marine Meteorological Services Data Requirements by the chairman of the ETDMP. Summary of his report is given in *Annex VI*.

60 JCOMM activities in the field of data management should be based on requirements of a wide range of marine data and products users. The group noted that requirements for GCOS and MMS applications cover a wide range of data and products on the physical state of the World Ocean. It also noted that marine meteorological and oceanographic variables required for GCOS and MMS applications overlap in a number of ways. It noted that GCOS data requirements are highly detailed and cover all aspects of data and products specification. This was primarily due to the fact that GCOS design documents determined specific applications of the system (detection of climate change; seasonal to interannual climate prediction and other). Demands of these applications form the basis of data requirements.

61 The group was also presented with summaries of requirements for ocean data, or observed variables, in support of different themes - operational meteorology and oceanography, numerical weather prediction and climate monitoring research and prediction (based on the results of OceanObs99).

62 The group noted that the WMO Secretariat maintains, on behalf of all WMO programmes, those of IOC and of the Committee on Earth Observation Satellites, a comprehensive data base of observational data requirements for the different programme areas, including, *inter alia*, NWP, operational meteorology, marine services, and climate prediction. This database was currently being used by CBS as part of its major project to re-design and rationalize the Global Observing System, a process to which JCOMM was contributing substantially in terms of marine environment. In addition, the data base was used as a resource for developing “Statements of Guidance” on how well the composite observing system met the observational data requirements of a number of application areas, such as marine services.

63 The group noted that this database would be taken into consideration by the JCOMM Observations Coordination group when assessing the status and capabilities of the existing operational ocean observing systems. At the same time, the group noted that a variety of data would come out in future on the basis of stated requirements, which implied that the DMCG and the ETDMP should take these overall data requirements into account when addressing the development of the future data management system under JCOMM.

64 The group noted with appreciation that the JCOMM satellite rapporteur, Dr Hiroshi Kawamura, and the JCOMMOPS coordinator, Mr Etienne Charpentier, participated as JCOMM representatives in the fourth session of the CBS Expert Team on Observational Data Requirements and the Redesign of the GOS (Geneva, 28 January to 1 February 2002). Within the context of this meeting, they prepared a first draft of a Statement of Guidance relating to the marine component of the GOS and JCOMM requirements for marine observational data. As noted by Dr Kawamura and Mr Charpentier, this draft now needs extensive review, both within JCOMM (the Services and Observations CGs) and outside (GOOS/COOP and GODAE).

65 This statement was reviewed by the recent first session of the JCOMM Management Committee, which recognized that the statement should be consistent with the Oceans Theme document of the IGOS Partners, and that it might serve to identify deficiencies in both this document and also the WMO/CEOS requirements database. The draft was also provided to the first session of the Services Coordination Group (Geneva, 3-6 April 2002), which will undertake a detailed review as the draft becomes more developed. In addition, the SCG has put in place a mechanism to review and update the WMO/CEOS database, specifically with respect to the observational data requirements for marine meteorological and oceanographic services.

66 The group agreed that a future JCOMM data management system should meet overall requirements from users. To develop such a system, the group agreed that it would be useful to identify main clients and actions to determine how to integrate to determine how to integrate a number of existing data management systems to meet the requirements. The group agreed that such actions should be designed on the basis of requirements from scientific panels. User requirements for end-to-end data management should be clearly identified, together with the data needed and their distribution means (**action**: see paragraph 56).

67 On the other hand, the group noted that OOPC and COOP had not fully specified their detailed data requirements in terms of data management. The group also noted that it was necessary to develop guidelines for describing user data management requirements (**action**: see paragraph 90).

68 In doing so, the group noted that experiences gained through the OIT pilot project focused on specific clients could be used to develop a data management system for a wide variety of clients. The group further noted that, whilst designed to be as general and wide spreading as possible, the future JCOMM integrated data management system should not attempt initially to try and meet any kinds of requirements, but rather should be conceived as flexible enough to be able to adapt itself to specific demands.

4.2 OTHER GOOS REQUIREMENTS

69 The group noted that, as already highlighted by JCOMM-I, the coastal components of GOOS, under the GOOS Coastal Ocean Observations Panel (COOP), had to be taken into account by JCOMM, in particular in their data management aspects. The question was to define more precisely the JCOMM role and to what extent it could meet user requirements in the field of data management.

70 The group first agreed that it should express its interest in COOP data management activities and take part in the design and implementation of COOP pilot projects. This was essential for JCOMM to meet its mandate of being the operational element of GOOS and of providing integrated end-to-end data management to global marine programmes (for instance, the integration of meteo-oceanographic physical data with pCO_2 and plankton data).

71 The group further recognized there was a wide range of past, present and planned projects, mainly of a regional nature, involving the exchange of chemical and biological data. Proposals regarding what would be feasible by JCOMM in this field could be inferred from the outcomes of such projects. In this context, the group, taking into consideration Dr Catherine Maillard's wide experience in this field, as well as her membership of the ETDMP, decided to request her, with the assistance of Dr Tony Knapp, Rapporteur on non-physical aspects relevant to JCOMM, the chair and vice-chair of IODE, the chair of the IODE GE-BCDMEP and Ms Savi Narayanan, in her capacity as member of

COOP, to develop proposals on how JCOMM could fulfil non-physical data management requirements of GOOS (**action**: Dr Maillard & al.; **deadline**: February 2003, if possible).

4.3 REQUIREMENTS FOR DATA ENCODING AND RELATED ISSUES

Codes and Formats

72 The group recalled that JCOMM-I had recognized the value of BUFR, a binary table-driven code, for the GTS exchange of oceanographic data and that the DMCG was requested to keep such exchange under review and to initiate actions for BUFR encoding and distribution of oceanographic data at the appropriate time. Bearing in mind the discussion under agenda item 3.6, the group further recognized the importance of JCOMM being represented on the relevant CBS Expert Teams, namely the Expert Team on Data Representation and Codes and the Expert Team on Migration to table-driven Code Forms (see item 5.2).

73 The group noted that CREX was a table-driven code in character form, essentially an alpha-numeric version of BUFR. A conversion to the ship board manual encoding of metocean data as CREX messages, from the existing standard character codes, while theoretically possible, would nevertheless most likely be unacceptable to ships' officers, with a resulting decrease in already scarce ship weather reports. The group noted that this issue would be primarily addressed by the Ship Observations Team.

Communications

74 JCOMM-I recognized there was a marked lack of uniformity among Inmarsat Land Earth Station and their associated National Meteorological Services regarding the policy for accepting ship reports using Code 41, with restrictions being applied in some cases, which resulted in loss of valuable data. The group noted with appreciation that SOT-I had established a Task Team on Satellite Communications System Costs chaired by Mr Volker Wagner. The group noted that Mr Wagner was a member of both the ETDMP and ETMC and requested him to report to those teams on this issue as appropriate (**action**: Mr Wagner; **deadline**: as needed)

4.4 METADATA EXCHANGE

4.4.1 Metadata management systems

IOC Metadata activities

75 The group recalled that JCOMM-I had noted with satisfaction the successful development of MEDI, a directory system for marine related datasets and data inventories, and had requested the DMCG to review the status and capabilities of the software and make appropriate recommendations regarding its usage.

76 The group noted that development of MEDI was proceeding as planned. The Second Session of the IODE Steering Group for MEDI had taken place in Honolulu, USA, from 2-4 April 2002. During the session, version 3.0 of the MEDI software had been reviewed. A few recommendations for final corrections had been adopted, which would be implemented by the Australian Oceanographic Data Centre, developer of the software. It noted also that MEDI will be fully compatible with NASA's GCMD (also used by GOSIC) and ISO19115 compliant. It was expected that the final user version would be available by the end of July 2002, at which time it would be made available for download on Internet and on CD-ROM. (See also item 5.1 with regard to metadata).

77 The group noted with appreciation the progress made by IODE with regard to MEDI. It remarked, however, that acquiring metadata records from the marine community was difficult and that it would be equally difficult to keep the information up-to-date. It suggested that technologies such as object request broker systems (ORBS) might be an appropriate solution. It noted that investigating

such technologies was also a topic of the OIT. The group had already proposed a pilot project to respond to some of those issues (see paragraph 56).

78 Acknowledging that many metadata management systems were now existing or being developed (e.g. MEDI, EDMED, EDIOS, SEA-SEARCH,…), ranging from simple catalogues that only provide data set descriptions to more integrated systems that enable access to the actual data, the group decided that a comparative study of existing metadata systems (covering both oceanography and meteorology) should be undertaken. The group accepted with thanks the offer by its Chairperson that her Organization undertake this study (**action**: Chinese NODC/WDC-D Oceanography; **deadline**: as soon as possible). It further requested Prof. Lin to draft a short project plan for this review and circulate it among the DMCG as well as to relevant members of IODE.

WMO Metadata Standards

79 The group reviewed the recent WMO CBS activities related to WMO Metadata standards. The CBS Expert Team on Integrated Data Management at its first meeting (Geneva, November 2001) reviewed existing metadata standards that could be applicable to WMO. The team agreed that, with some effort, the draft ISO standard Geographic Metadata (19115) could be applied to WMO requirements. The ISO 19115 specifies a process where a community can adopt parts of the standard that it feels are relevant (including the "Core Elements") and also extend the elements, keywords and code table instances to suit that community. The team noted that the WMO might need to accept more than one such "Community Profile" for the different WMO Programmes, but that there should be a Community Core Profile which could be adopted by all of WMO, with the potential for further extensions where necessary. With this process in mind the team had developed a draft "WMO Community Core Metadata" profile (see: http://www.wmo.ch/web/www/metadata/core-standard.html).

4.4.2 Marine XML

80 JCOMM-I had requested the DMCG to address the issue of a standard marine markup language to facilitate the exchange of data both within and among the different sectors of the marine community including many types of organizations, research institutes, ships, satellites, moored instruments, drifting instruments, government agencies and commercial companies, which could be both data originators and data or data product users.

81 The group noted that XML was rapidly becoming a standard for exchanging information between applications, as well as for providing information on which the formatting of data for display in a browser might be defined. Industry standards were being defined to allow the exchange of information between applications using the XML standard, with the expectation that many business transactions would use XML as their standard means of data exchange.

82 JCOMM-I had noted the planned establishment of the International Marine XML Consortium which would manage the development of a specification for a marine XML that would be publicly available as an open standard. JCOMM-I had requested the DMCG to address urgently the issue of an agreed standard marine markup language for JCOMM activities. In particular the group had been requested to develop a strategy that took into account the marine XML consortium, the related activities of CBS, and the many national activities in this regard.

83 The group recalled IOC progress in this area: (i) in February 2002, the XML Consortium Secretariat was transferred to the IOC/IODE Secretariat in Paris, upon request by Mr Ben Searle, IODE Chairman; (ii) a project proposal for the development of a marine XML specification was submitted to the European Union, involving IOC as a partner. This proposal was currently under evaluation; (ii) IOC/IODE and ICES jointly organized the first ICES/IOC Study Group on the Development of Marine Data Exchange Systems using XML (SGXML) in Helsinki, Finland from 15-16 April 2002. The SGXML agreed to a standardization of naming conventions, incorporation of existing metadata standards into any development, and concentrated efforts on general cruise related

metadata and point data structures. It was also agreed that IOC would host a marine XML community portal (http://www.marinexml.net).

84 The group reviewed the doc on XML commissioned by WMO (see paragraph 79). To ensure interoperability, WMO experts have developed a preliminary framework for mapping the proposed data and metadata standard into XML The group agreed on the importance of JCOMM participation in this process of developing standards that would apply to all types of marine data and metadata, through nominating a JCOMM expert as a member of the CBS Expert Team on Integrated Data Management (**action**: see item 5.2).

85 The DMCG noted that, as part of the development of standards for a WMO catalogue of datasets, the CBS ET on Integrated Data Management had developed a draft list of keywords that could be used to describe WMO datasets (see:
http://www.wmo.ch/web/www/metadata/WMO-keywords.html).
The group members were encouraged to send comments and suggestions for expanding this list to the WMO Secretariat (**action**: DMCG members; **deadline**: as soon as possible).

86 Noting the efforts with regard to XML in both the oceanographic and meteorological communities, the group recognized the need for closer collaboration between IODE and CBS in a JCOMM framework. It therefore proposed the OIT pilot No. 3, as described in paragraph 56.

4.5 MONITORING DATA AND INFORMATION FLOW AND QUALITY

87 The group noted with interest a report on monitoring data and information flow and quality by its chairperson, Prof Shaohua Lin. She recalled that JCOMM-I had reiterated the importance of monitoring information flow at all points of the end-to-end system, and had requested the DMCG to implement a mechanism with the DMPA, to provide timely and accurate information on data and products. Prof. Lin suggested the development of a global metadata depository system concentrating on data held by JCOMM Member States. However, the group stated that this would be a massive task beyond the resources of the DMPA and restated that JCOMM should build on existing systems in this regard (MEDI, GCMD, EDIOS, EDMED,…) as already recommended under agenda item 4.4.

88 The group recalled the task assigned to it by JCOMM-I: "The Commission … requested the Management Committee to develop an integrated strategy for monitoring within JCOMM, taking account of the several existing activities undertaken by Members/Member States. That strategy should take account of, and be harmonized with, monitoring activities under CBS and other relevant groups. The Commission reiterated the importance of monitoring information flow at all points of the end-to-end system and requested the Data Management Coordination Group to implement a mechanism , within the Data Management Programme Area, to provide timely and accurate information on data and products."

89 The group stressed the importance of monitoring data flow and evaluation of performance and decided to work with the OCG and the Management Committee, as appropriate, to design and implement a performance evaluation system (**action**: DMCG; **deadline**: as soon as possible). In this regard, the group was informed that OCG-I had addressed the issue of data flow and related performance indices. The OCG was now preparing a document (drafted by S.Wilson, R.Keeley and E.Charpentier) that will be circulated to the DMCG. Mr Robert Keeley was requested to act as liaison (**action**: Mr Keeley; **deadline**: when feasible).

4.6 JCOMM STRATEGY FOR END-TO-END DATA MANAGEMENT

90 The group noted with appreciation a presentation by the chair ETDMP on the topic of integrated end-to-end data management strategy for JCOMM (referred to as E2EDM). It was unanimous in considering that the question was both crucial and very difficult. After a lively discussion where, in particular, some slightly divergent views were expressed *inter alia* by Mr Keeley, it came to the following conclusions:

(i) there was a need to reach a consensus regarding the approach to E2EDM. To that end, as a first step, any considerations on the topic, including those already presented orally to the group (e.g. by Mr Keeley), would be submitted in writing to the chair ETDMP (**action**: members of DMCG; **deadline**: August 2002);

(ii) a small *ad hoc* group, made up of the chairs ETDMP (chair of the *ad hoc* group), ETMC and IODE and Mr Keeley, would work by correspondence to combine the ideas expressed under (i) above and by the chair ETDMP into a single consolidated draft strategic plan, for submission to the ETDMP, the DMCG and the Management Committee (**action**: *ad hoc* group; **deadline**: December 2002);

(iii) the ETDMP as a whole will be entrusted with preparing a technical document regarding the integration technology to be used within the E2EDM. A technical meeting of the ET will be needed to finalize the document (**action**: ET/DMP; **deadline**: mid 2003 for the preparatory work; end 2003 for the technical meeting);

(iv) the OIT pilot project on the integration of data streams (see paragraph 56) would be part of the design of the strategic plan.

91 The group expressed the hope that the Task Team on the Development of an IOC Strategic Plan for Oceanographic Data and Information Management, the establishment of which was foreseen in a draft resolution to be submitted to the forthcoming IOC Executive Council, would be actually established and would complement its own efforts in the field of E2EDM.

5. MATTERS FOR URGENT ACTION

5.1 ODAS METADATA

5.1.1 Format review by IODE

92 The group recalled that the ODAS metadata format had been developed within the framework of the former CMM in order to enable the development of a comprehensive metadata base for ocean data acquisition systems (ODAS) including moored and drifting buoys, offshore platforms etc. That database would allow a full and accurate interpretation of the observational data from ODAS that were available in climatological archives. JCOMM-I decided to adopt the proposed format (Rec. 1 (JCOMM-I)).

93 It was considered important to ensure that the ODAS metadata format did not conflict with related IODE metadata systems such as MEDI. Accordingly a comparative review was made of both systems by IODE. The review concluded that ODAS is a secondary level directory that provided detailed descriptions of data collected by ocean data acquisition systems. MEDI, on the other hand, was a top-level directory for descriptions of all marine data sets. The current MEDI system did not provide for the additional "granularity" of metadata descriptions available in the ODAS system.

94 During the ninth Session of the IODE Group of Experts on Technical Aspects of Data Exchange (GETADE) (Helsinki, Finland, 20-22 April 2002), it was agreed to investigate and prepare for increasing granularity of the information in MEDI and specifically to further compare the ODAS metadata format to the MEDI format in more detail, noting that they are conceptually at different levels of detail.

95 The group noted with appreciation the GETADE initiative and welcomed closer collaboration between JCOMM and IODE in this regard.

5.1.2 The ODAS metadata centre

96 JCOMM-I had recognized the urgent need to identify a centre willing to host the ODAS metadata base and requested the co-presidents in consultation with the chairpersons of the DBCP and

the Data Management Coordination Group, and the Secretariats, to obtain the agreement of such a host center as soon as possible.

97 .Prof Lin offered to host the ODAS metadata base at the National Marine Data and Information Service, Tianjin, China (WDC-D Oceanography). The group thanked Prof Lin and requested her to provide more details about the client service requirements that hosting the ODAS database would entail. The group further requested Prof Lin to collaborate with IODE GETADE in their investigations into MEDI-ODAS comparisons, to further specify the characteristics of the service, and to keep it informed through the preparation of an action plan.

5.2 JCOMM AND THE INTER-PROGRAMME TASK TEAM ON FUTURE WMO INFORMATION SYSTEMS

98 Bearing in mind the discussion under agenda item 3.6 and 3.7, the group agreed that it was important to nominate JCOMM experts as members of the three CBS Expert Teams, namely: the Expert Team on Data Representation and Codes, and the Expert Team on Migration to Table-Driven Code Forms, the Expert Team on Integrated Data Management, as well as of the Inter-programme Task Team on Future WMO Information Systems, to effect liaison between CBS and JCOMM.

99 To this end, the group decided as follows:

- Prof. Lin S., chairman of the DMCG and Dr. N. Mikhailov would represent the JCOMM on the Inter-programme Task Team on Future WMO information System and on the CBS Expert Team on Integrated Data Management, respectively. Their alternates should be identified if they are not available, to make sure JCOMM is attending their coming meetings.
- Mr R. Keeley (Canada) will represent the JCOMM on the CBS Expert Team on Data Representation and Codes, and the Expert Team on Migration to Table-Driven Code Forms. The IODE chair (or alternate) and/or the JCOMMOPS Coordinator would be alternates to Mr Keeley in case he can not attend coming sessions of these CBS Expert Teams.

5.3 CCl REVISED GUIDE TO CLIMATOLOGICAL PRACTICES

100 The WMO Commission for Climatology (CCl) is updating the WMO Guide to Climatological Practices (WMO- No.100). The group recalled that JCOMM-I had agreed that it should assign experts to assist CCl in preparing appropriate sections of its revised Guide that dealt with the recording processing and archiving of marine climate data. The group noted that action in this regard was being undertaken by the Expert Team on Marine Climatology (**action**: ETMC; **deadline**: as soon as possible).

6. OTHER BUSINESS

6.1 EXISTING OCEANOGRAPHIC AND MARINE METEOROLOGICAL DATA HOLDINGS

101 The group reviewed the marine data holdings within the framework of the former CMM. It was also presented with a status summary of the WMO INFOCLIMA catalogue, which included marine and ocean data base information.

102 JCOMM-I had recognized that there were probably a number of similar oceanographic and marine meteorological data holdings in existence, which should be identified and, if possible, included in freely accessible data archives. JCOMM-I had therefore requested the DMCG to review the situation and to propose appropriate follow-up actions.

103 An overview similar to the one provided by WMO (see paragraph 101) had not been possible for IODE due to the great number of existing metadata systems. The group noted that such an

overview would be possible on the basis of the comparative study of existing metadata systems, as agreed upon under Agenda Item 4.4.1. The group called on the team that would undertake the study to include GOSIC (**action**: WDC-D Oceanography; **deadline**: as soon as possible).

104 The group stressed the need for close cooperation with IODE in these matters in view of the substantial data holdings held by IODE data centers (**action**: DMCG, IOC Committee for IODE; **deadline**: continuous).

Surface current data

105 With regard to surface current data, JCOMM-I had decided on the discontinuation of the ISCDC and had recommended that data holdings of the Centre should be transferred to the appropriate WDC.

106 Prof Lin offered to host the ISCDC database at the National Marine Data and Information Service, Tianjin, China (WDC-D Oceanography). The DMCG accepted the kind offer of China and requested Prof Lin to provide more details about the client service requirements that hosting the ISCDC database would entail.

107 In addition, JCOMM-I had recognized the need for an archive for surface current data from all sources, and had requested the DMCG to undertake action in this regard. The group stressed that it would not be appropriate to develop a centralized surface current database but that efforts should rather be undertaken to integrate the many existing sources of surface current data.

Storm surges

108 The group recalled that CMM-XII (Havana, March 1997) had supported a project being undertaken by the former Subgroup on Marine Climatology to compile a catalogue of global storm surge data holdings. Early findings of the project include:

- Substantial amounts of storm surge data are archived in a number of countries;
- There is some interest in having a global catalogue of data holdings;
- There is also some interest in the eventual international exchange of these data, at least regionally.

109 The group noted that the Expert Team on Marine Climatology was planning to make a survey on storm surge data archival. The group noted that this task should be done in collaboration with IODE and also with ITSU (**action**: ETMC, ITSU Secretariat; **deadline**: as soon as possible). At the same time, the group agreed that storm surge datasets should be duly included in the comparative study of existing metadata systems (see paragraph 78).

110 The group stressed the need to inform the marine and meteorological communities on any metadata, data, information or product that would be developed by JCOMM and requested the Secretariats to ensure that information would be posted on all relevant web sites and other publications (**action**: joint JCOMM Secretariat; **deadline**: continuous).

6.2 INTERNATIONAL WORKSHOP ON ADVANCES IN MARINE CLIMATOLOGY

111 The group recalled that JCOMM-I had agreed to hold a second CLIMAR International Workshop on Advances in Marine Climatology.

112 As requested by the first session of the JCOMM Management Committee, the chairman of the ETMC and the Secretariat have started to establish an scientific organizing committee for this workshop. The group agreed with the tentative proposal for that committee (D. Dehenauw (Belgium), D.E.Harrison (USA), M. Mietus (Poland), D. Parker (U.K.), V. Swail (Canada), S. Woodruff (USA), T. Manabe (Secretariat)). The group reviewed some background and summary of CLIMAR 99 (Vancouver, Canada, September 1999) and also of a Workshop on Advances in the Use of Historical Marine Climate Data (Boulder, USA, January 2002). It agreed that outcomes of these past workshops

and other related meetings and workshop should be considered for the organization of CLIMAR-II. The group further noted that the workshop was tentatively planned to take place in Brussels in November 2003, probably in conjunction with an historical conference to celebrate the 150th Anniversary of the Brussels Conference of 1853, as suggested by JCOMM-I. The Organizing Committee was requested to report to the Management Committee on the progress on the arrangement for the workshop, for its review, as appropriate (**action**: scientific organizing committee; **deadline**: periodically).

7. FUTURE WORK PROGRAMME

113 Based on discussions under preceding agenda items, the detailed work plan for the Data Management Programme Area, including its component teams was revised. This revised work plan is given in *Annex VII*.

8. DATE AND PLACE OF THE NEXT SESSION

114 The group agreed that, in principle, its next formal meeting should be in the first half of 2004, with exact dates and place to be decided later by the chairman and Secretariat. In this context, it was pleased to accept the kind invitation of its chairperson to hold the session in China. At the same time, it considered that advantage should be taken, where possible, of attendance of a significant number of members of the group at other events, to convene special *ad hoc* sessions to address specific issues of immediate importance. Similar arrangements should apply the sessions of its Expert Teams.

9. CLOSURE OF THE SESSION

115 In closing the session, Prof Lin expressed her thanks to all participants for the assistance they had provided to the chair and for their excellent spirit of cooperation. She expressed the hope that a good job could be accomplished during the intersessional period by maintaining contact between all members through e-mail. She concluded in wishing everybody a safe and good trip back and in looking forward to meeting them again at the next session in China.

116 On behalf of all participants, Ms Narayanan thanked the chair for the excellent work she had accomplished during the session and the joint JCOMM Secretariat for its continuous support.

117 The first session of the JCOMM Data Management Coordination Group closed at 12.45 hours on Saturday, 25 May 2002.

ANNEX I

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ANNEX II

AGENDA

1. ORGANIZATION OF THE SESSION

1.1 OPENING OF THE SESSION
1.2 ADOPTION OF THE AGENDA
1.3 WORKING ARRANGEMENTS

2. REVIEW OF JCOMM DECISIONS AND PLANS RELEVANT TO THE WORK OF THE DMPA

3. REVIEW OF EXISTING AND PLANNED DATA MANAGEMENT MECHANISMS AND PRACTICES

3.1 MARINE CLIMATOLOGICAL SUMMARIES SCHEME (MCSS)
3.2 SPECIALIZED OCEANOGRAPHIC CENTRES (SOCs)
3.3 GLOBAL TEMPERATURE AND SALINITY PROFILE PROGRAMME (GTSPP)
3.4 PILOT PROJECT ON SURFACE SALINITY DATA MANAGEMENT
3.5 ARGO DATA MANAGEMENT
3.6 USE OF NEW TECHNIQUES FOR REAL-TIME DATA EXCHANGE
3.7 FUTURE WMO INFORMATION SYSTEM
3.8 OTHERS
3.8.1 The Global Observing Systems Information Centre (GOSIC)
3.8.2 An Ocean Information Technology (OIT) project
3.8.3 Sea Ice data management

4. REQUIREMENTS FOR END-TO-END DATA MANAGEMENT

4.1 GCOS AND MMS REQUIREMENTS
4.2 OTHER GOOS REQUIREMENTS
4.3 REQUIREMENTS FOR DATA ENCODING AND RELATED ISSUES
4.4 METADATA EXCHANGE
4.5 MONITORING DATA AND INFORMATION FLOW AND QUALITY
4.6 JCOMM STRATEGY FOR END-TO-END DATA MANAGEMENT

5. MATTERS FOR URGENT ACTION

5.1 ODAS METADATA
5.1.1 Format review by IODE
5.1.2 The ODAS metadata centre
5.2 JCOMM AND THE INTER-PROGRAMME TASK TEAM ON FUTURE WMO INFORMATION SYSTEMS
5.3 CCl REVISED GUIDE TO CLIMATOLOGICAL PRACTICES

6. OTHER BUSINESS

6.1 EXISTING OCEANOGRAPHIC AND MARINE METEOROLOGICAL DATA HOLDINGS
6.2 INTERNATIONAL WORKSHOP ON ADVANCES IN MARINE CLIMATOLOGY

7. FUTURE WORK PROGRAMME

7.1 DATA MANAGEMENT COORDINATION GROUP
7.2 EXPERT TEAM ON DATA MANAGEMENT PRACTICES
7.3 EXPERT TEAM ON MARINE CLIMATOLOGY

8. DATE AND PLACE OF THE NEXT SESSION

9. CLOSURE OF THE SESSION

ANNEX III

Summary Report on the Results of JCOMM-I

Introduction

1. The Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was formally established in 1999 by Thirteenth Congress and the Twentieth Session of the IOC Assembly, through a merger of the Commission for Marine Meteorology (CMM) and the Joint IOC/WMO Committee for IGOSS. JCOMM is the reporting and coordinating mechanism for all operational marine activities in both WMO and IOC. As such, it is charged with the international coordination, regulation and management of an integrated, operational, oceanographic observing, data management and services system which will eventually become the ocean equivalent of the World Weather Watch.

2. The first session of JCOMM took place in Akureyri, Iceland, from 19 to 29 June 2001. Substantial support for the meeting, as well as warm and generous hospitality, was provided by the Icelandic Meteorological Office and by the City and University of Akureyri. At the opening ceremony, participants were welcomed by Ms Siv Fridleifsdottir, Minister for the Environment; Mr Magnus Jonsson, Permanent Representative of Iceland with WMO; Mr Kristjan Thor Juliusson, Mayor of Akureyri; Professor G.O.P. Obasi, Secretary-General of WMO; and Dr Patricio Bernal, Executive Secretary of IOC. The Commission was also honoured by a visit during the second week of the session by Dr Olafur Ragnar Grimsson, President of Iceland, and by Dr John Zillman, President of WMO.

3. While the membership of JCOMM is still growing, at the time of the session the Commission had approximately 250 members from 122 Members of WMO and Member States of IOC. The session was attended by 113 participants from 42 Members/Member States and 11 international organizations. It was particularly pleasing to note that almost all the national delegations included approximately equal numbers of meteorologists and oceanographers. This was an indication of the importance which both communities placed on JCOMM, and it also ensured a good balance in the debates during the session and in the priority issues to be addressed by the Commission. The DBCP was represented at the session by David Meldrum, vice-chairman, and Etienne Charpentier, technical coordinator.

4. In their report to the session, the interim co-presidents, Mr Johannes Guddal and Professor Dieter Kohnke, firstly recalled the dramatic progress which had been made since CMM-XII (Havana, March 1997) in developing the JCOMM concept, in its acceptance by the governing bodies of WMO and IOC, and in the transition to the new institutional and working arrangements. They then briefly outlined the substantive achievements during the past intersessional period, under CMM, IGOSS and also all the other groups now reporting to JCOMM. These included further consolidation in the marine broadcasting system for the GMDSS, the Marine Pollution Emergency Response Support System (MPERSS) and the Global Digital Sea Ice Data Bank (GDSIDB); implementation of the VOSClim Project and of an operational Ship-of-Opportunity Programme; substantial enhancements to global data buoy deployments and the commencement of the Argo Project of sub-surface profiling floats; the implementation of the electronic JCOMM Products Bulletin; and major capacity building activities. The interim co-presidents continued by outlining a vision for the future of JCOMM, as well as major issues to be addressed during the coming intersessional period. These included in particular the phased implementation of a fully integrated, operational ocean observing, data management and services system; implementation of a JCOMM in situ Observing Platform Support Centre (JCOMMOPS); close collaboration with GOOS and GCOS, in particular in ocean observations and data management for climate; and implementation of the new JCOMM Capacity Building Strategy.

Scientific input and requirements

5. There was full agreement at the session that a major priority for the coming intersessional period would be the implementation and maintenance of an operational ocean observing system to provide the data required to support global climate studies. Detailed requirements for these data have been developed and will be maintained by the Ocean Observations Panel for Climate of GOOS, GCOS

and the WCRP, which thus becomes one of the primary scientific advisory bodies for JCOMM. In reviewing the report of the OOPC to the session, the Commission recognized a number of priority requirements, including the implementation and long-term maintenance of Argo and its integration with the SOOP; operational implementation of VOSClim; long-term resources for system maintenance; and integrated data management.

Marine meteorological and oceanographic services

6. The Commission noted with satisfaction that the WMO marine broadcast system for the GMDSS of IMO had been fully implemented prior to the final implementation date for the GMDSS of 1 February 1999, and congratulated all concerned for this outstanding work. It adopted a number of small amendments to the regulations covering the GMDSS marine broadcast system as given in the Manual on Marine Meteorological Services (WMO-No. 558), which included two new Metareas (17 and 18) to allow for the extension of SafetyNET services in Arctic waters. At the same time, the Commission recognized the ongoing need for terrestrial maritime safety broadcasts to some coastal waters and for shipping not subject to SOLAS, and therefore agreed to maintain the existing terrestrial broadcast component of the Manual pending a major revision by the Expert Team on Maritime Safety Services. The Commission further recognized the importance to mariners of meteorological information in graphical form, and therefore urged the early completion of the project for the delivery of such graphical information through Inmarsat C, as part of SafetyNET. The Commission reviewed the status of the project for the harmonization of meteorological services delivered by NAVTEX in the Baltic Sea region, urged rapid formal acceptance of the guidelines developed under the project, and commended the rapporteur (Dr Michal Ziemianski, Poland) and his co-workers for their efforts in preparing and testing these guidelines.

7. The Commission recognized that the wave programme had continued to provide valuable support to many Members/Member States in their provision of wave related services to users. It noted a detailed revised programme of action for the coming four years, and agreed that the programme should be extended to cover also the analysis, modelling and forecast of storm surges. The Commission also recognized the considerable importance of on-going work on sea ice and polar region issues, in particular to maritime safety and global climate studies. It noted with appreciation the substantial on-going development of the Global Digital Sea Ice Data Bank, which it agreed was an important resource supporting the WCP, as well as the work undertaken on ice codes, formats and nomenclature. The Commission fully supported enhanced involvement with external sea ice groups such as the Baltic Sea Ice Meeting and the International Ice Charting Working Group.

8. The Commission strongly supported the full implementation of the Marine Pollution Emergency Response Support System, as a means of providing coordinated and timely meteorological and oceanographic data and services to support operations in response to major pollution emergencies originating outside territorial waters. It expressed appreciation for the seminar and workshop on MPERSS held in Townsville, Australia, in 1998, and agreed that another such event in support of MPERSS implementation should take place in 2002 or 2003. The Commission recognized the considerable value of the JCOMM Electronic Products Bulletin, as a means of making easily available to Members/Member States both data sets and tailored oceanic products on an operational basis. It agreed on the importance of securing the resources needed to ensure its long-term maintenance, and further supported the concept of a specialized workshop on "JCOMM Products in Support of Operational Oceanography and Marine Meteorology", to provide a catalyst for further development of the Bulletin. Finally, the Commission acknowledged the continuing importance, to both service providers and users, of the regular monitoring of user responses to marine meteorological services. It reviewed the results of the most recent such survey and urged their wide distribution. It agreed that the next survey of this type should take place in 2004.

Observing systems

9. Existing and future operational ocean observing networks involve a complementary mix of in situ and remote sensing technologies and platforms. These include ship-based systems (the traditional VOS, the XBT ship-of-opportunity programme, ASAP and future non-physical measurements),

autonomous unmanned devices (drifting and moored buoys, floats, other sub-surface vehicles), tide gauges and coastal stations, satellites, aircraft and ground-based radars. The increasing requirement of all users for the delivery of fully integrated data and product streams is, in turn, increasing pressure for a more integrated approach to the observing systems themselves. As a first step towards such enhanced integration, the Commission agreed to establish a Ship Observations Team, grouping the existing ship-based observing panels (VOS, SOOP and ASAP), and creating a mechanism to deal more easily with new observation requirements and technologies. Further with regard to ship-based observations, the Commission was particularly appreciative of the expansion of the ASAP network through the Eumetnet ASAP Project (E-ASAP) and the Worldwide Recurring ASAP Project (WRAP); the implementation of the VOSClim Project, to establish a high-quality reference subset of VOS meteorological data; and the restructuring of the SOOP XBT network in response to the upper ocean thermal review recommendations.

10. The Commission recognized that both drifting and moored ocean data buoys now constitute a major component of the integrated ocean observing system, and that the DBCP had been instrumental both in enhancing the coordination of national and regional buoy programmes, and also in improving the quantity and quality of buoy data available on the GTS. At the same time, the Commission noted the substantial on-going problem caused through the vandalism of data buoys, and adopted a recommendation designed to address this problem. The Commission further recognized that the Argo project represents a significant development in large-scale oceanography, and agreed that it should eventually become a part of the overall operational ocean observing system coordinated through JCOMM.

11. Oceanographic satellites constitute an essential component of the present and future operational ocean observing system. The Commission recognized that it is of fundamental importance to identify the observational requirements of JCOMM in relation to continuing satellite missions and to establish a dialogue on the complementary value of in situ data and products to satellite agencies. In this context, an immediate challenge is to work with operators, through various mechanisms, to develop continuity and sustained operation, as discussed in the IGOS Oceans Theme document. To this end, the Commission agreed that several different paths to the operators could and should be used, provided that the message conveyed is consistent and coherent. These include: with GOOS through the IGOS Partners and the Oceans Theme; through the CBS processes, such as the Rolling Requirements Review; CGMS; and the Consultative Meetings on High Level Policy on Satellite Matters.

12. The Commission strongly supported the proposal to establish a JCOMM in situ Observing Platform Support Centre (JCOMMOPS), based initially on the existing DBCP/SOOP and Argo coordination mechanisms. It recognized that the centre is already operational, and a review is to be undertaken to assess the benefits and efficiency that might be achieved by extending the terms of reference of JCOMMOPS to include also support for VOS and ASAP.

Data management

13. The Commission undertook a thorough review of the status of existing marine data management activities falling within its area of responsibility, including in particular those for VOS data (the Marine Climatological Summaries Scheme, MCSS), for sub-surface temperature and salinity (the Global Temperature and Salinity Profile Programme, GTSPP), and for buoy and float data (managed through the DBCP and Argo, respectively). The Commission adopted the comprehensive metadata format for ocean data acquisition systems, developed by the DBCP and the former CMM Subgroup on Marine Climatology.

14. At a general level, the Commission agreed that a fundamental principle for its data management was to integrate meteorological and ocean measurements and to provide multi-parameter products and services in response to user needs. It therefore charged its Data Management Coordination Group, together with the Expert Team on Data Management Practices, with reviewing and assessing overall JCOMM requirements for end-to-end data management, and with developing a strategy for the Commission in this regard. The Commission also recognized that there was a

considerable amount of related work, in particular using Internet and other new technologies, being undertaken or planned elsewhere. This included the future WMO information systems project within CBS, the development of standard metadata languages such as XML, and a proposed ocean and marine meteorology data and information technology project. It agreed that JCOMM should follow all this work very closely, and be involved where appropriate, and requested the Data Management Coordination Group to undertake this task.

Capacity building

15. The Commission noted with appreciation the large number of specialized training workshops which had been conducted during the intersessional period, on topics such as remote sensing, marine pollution, wave and surge forecasting, sea level measurements and the work of PMOs, as well as the fellowships for long-term marine training awarded by WMO. It urged that these activities should be continued in support of JCOMM, and at the same time requested its new Task Team on Resources to investigate potential new sources of funding for training. The Commission reviewed and adopted an overall JCOMM Capacity Building Strategy document, which it agreed provided a blueprint and general framework for the conduct of all future JCOMM capacity building activities.

External relations

16. While JCOMM needs to interact in various ways with most of the other major programmes and bodies of WMO and IOC, it will continue to have particularly close relations and interactions with GOOS, GCOS, CBS and IODE. One aspect of such interactions which engendered considerable debate concerned the developing requirements under GOOS for the international operational collection, exchange and management of non-physical ocean data (ocean chemistry and biology). It was recognized that JCOMM is most probably the appropriate mechanism to undertake this work, but at the same time the Commission presently has no expertise or capabilities in these disciplines. The Management Committee was therefore requested to interact with GOOS on this subject, with a view to eventually developing some formal proposals for the Commission.

17. Outside WMO and IOC, JCOMM will continue to work closely with international organizations and bodies such as IMO, IHO, UNEP, ICSU/SCOR, etc. in a number of areas of common interest and concern. The Commission also supported the continuing involvement of WMO and IOC in various inter-agency coordination activities relating to the oceans, including in particular preparations for and participation in the World Conference on Sustainable Development, Johannesburg, September 2002. It noted with satisfaction that both WMO and IOC had actively supported and contributed to the development of the UN Atlas of the Oceans project.

Scientific lectures

18. One half-day of the session was devoted to a set of scientific lectures on the general theme of "operational oceanography". The texts of these will be published as a JCOMM Technical Report, and similar scientific lectures are planned for JCOMM-II.

JCOMM sub-structure

19. The Commission decided that its work and sub-structure would be organized within four Programme Areas, each managed by a Coordinator and small Coordination Group – Services, Observations, Data Management and Capacity Building. Within each Programme Area, specific activities will be undertaken by a number of Expert Teams, Task Teams and Panels. Overall guidance and oversight for the work of the Commission will be provided by a Management Committee, chaired by the two co-presidents of JCOMM, and including the four Programme Area Coordinators and a small number of other selected experts. The nine members of the Committee include four meteorologists, four oceanographers and one polar region expert. The DBCP, with its Action Groups, constitutes an essential component of the Observations Programme Area, for which the coordinator is Dr Stan Wilson (USA). The DBCP chairman is an ex-officio member of the Observations

Coordination Group, but the panel itself will continue, for the time being at least, to maintain its statutory and functional autonomy from JCOMM.

Elections

20. The Commission elected Mr Johannes Guddal (Norway) as its co-president for meteorology and Dr Savi Narayanan (Canada) as its co-president for oceanography.

Next session

21. The Commission was pleased to accept the offer from Canada to host its second session in the year 2005.

ANNEX IV

Tentative Work Strategy for JCOMM DMPA

According to the tasks defined at JCOMM-I for the Data Management Coordination Group (DMCG) and Expert Teams (on Data Management Practices and on Marine Climatology), tentative working strategy arrangements for the intersessional period of JCOMM-I to JCOMM-II are as follows:

1. Objectives of JCOMM Data Management Programme Area
   Develop JCOMM data management strategy and an implementation plan for JCOMM end-to end data management; accomplish the tasks of data management defined at JCOMM-I.

2. The mission of DMCG
   Develop and submit for approval to the JCOMM Management Committee a JCOMM data management strategy; accomplish the data management tasks those with high priority; discussion and determine the implementation plan of JCOMM data management and other data management matters raised at JCOMM intersessional period.

3. Objectives of Expert Teams (ET on DMP and ET on MC)
   Develop a JCOMM data management implementation plan based on the JCOMM data management strategy; accomplish the technical matters of priority relevant to data management raised during the JCOMM-I.

4. Working Relations between DMCG and ETs
   Through reviewing and analyzing the existing data management mechanism and programmes of IOC and WMO to determine the objectives and principles, frame structures and data flow of JCOMM data management, the requirements of data processing and quality management, as well as the mechanism of user's feedback and system monitoring.

5. Work plan for DMCG

   5.1 Assisting, if required, the JCOMM co-Chairmen and WMO/IOC Secretariat to select members of Expert Team on Data Management Practice (ET on DMP) by the end of 2001.

   5.2 On the preconditions of accomplishing the task at its maximum capacity, priorities should be identified. At present, the work could be arranged for two phases: from present to May 2002, and from June 2002 to December 2002.

   5.3 Proposed work plan before the First Meeting of DMCG (May 2002)

   (1) Review the mechanism of WMO/IOC oceanographic and marine meteorological data management and exchange, keeping with the general requirements of end-to-end data management, and considering the coordinating procedure and method between JCOMM and DMCG and to solve the existing problems:

   - The system of Specialized Oceanographic Centers (SOCs) and of marine monitoring established under IGOSS needed to be reviewed; (Para 7.4.24)
   - Establish a Sea Surface Salinity Pilot Project, and to develop procedures for and coordinate JCOMM input to the pilot project; (Para 7.2.5)
   - Review the development of Argo data management, with a view towards a full integration into the JCOMM overall observing system at an appropriate time; (Para 7.3.9)
   - Possible actions to ensure an appropriate JCOMM participation in the CBS activities related to data exchange; (Para 7.4.18)

- Review the work of Inter-Programme Task Team on Future WMO Information Systems, and take up the issue through assigning an expert to represent JCOMM's interests in the Task Team on Future WMO Information System. (Para 7.4.29)

(2) Key Issues on Integrated JCOMM Data Management

- Review and assessment of the general requirements for end-to-end data management practices; (Para 7.2.11, Para 7.2.6)
- Code and Format. Review the requirement for exchange of new oceanographic data and initiate actions for BUFR encoding and GTS distribution of new oceanographic data at the appropriate time; (Para 7.4.4,Para7.4.5, Para7.4.11, Para7.4.34)
- Develop an integrated strategy for monitoring of data flow and quality; (Para7.4.25);
- Strategy for JCOMM end-to-end data management.(Para7.5.1, Para7.2.6)

(3) Matters to be defined quickly

- Ocean Data Acquisition Systems (ODAS) Metadata Center; (Para7.
- Assign an expert to represent JCOMM's interests about codes and formats in inter Programme Task Team on Future WMO Information System;
- To assign experts to assist the Commission for Climatology (CCI).

5.4 Work Plan of DMCG for the Period of June 2002 to December 2002

Based on the discussions at JCOMM-I, the above-mentioned tasks should be accomplished one by one, and the summary report should be drafted; report for JCOMM end-to-end data management strategy should be finished; technical arrangement for the JCOMM end-to-end data management implementation plan should be discussed with Expert Teams.

5.5 Working Mechanism of DMCG

Upon reaching the unanimous view on the work plan, the task will be disassembled to expert or to Expert Team. The Chairman of the DMCG will organize, coordinate and monitor the process of the tasks being accomplished.

The work of DMCG will be organized and coordinated through e-communication. If the budget permits, the meeting could be held every six to eight months in the first two years to promote exchange and oversee the implementation of the tasks.

The DMCG will enhance the cooperative relations with IODE and CBS, and establish a routine coordinating mechanism.

6. Work plan of Expert Team on DMP (Proposed by the Chair ETDMP)

7. Work plan of Expert Team on MC (Proposed by the Chair RTMC)

ANNEX V

Vision of the Future WMO Information System

Interprogramme Task Team on Future WMO Information Systems

August 2001

1. The vision proposes that the Future WMO Information System should provide an integrated approach to meeting the requirements of:

- Routine collection of observed data
- Automatic dissemination of scheduled products, both real- and non-real-time
- Ad-hoc non-routine applications (e.g. requests for non-routine data and products)

The system should be:

- Reliable
- Cost effective and affordable for developing as well as developed Members
- Technologically sustainable and appropriate to local expertise
- Modular and scalable
- Flexible - able to adjust to changing requirements and allow dissemination of products from diverse data sources

The system should also support:

- Different user groups and access policies
- Integration of diverse datasets
- Data as well as network security
- Ad hoc as well as routine requests for data and products (“pull” as well as “push”)
- Timely delivery of data and products (appropriate to requirements)

2. Routine collection and dissemination should be accomplished via a "push" system, which could be implemented via a combination of technologies. It could include store and forward systems (which could include multiple levels organised an a tree structure), point to point communications (including use of simple technologies such as e-mail) and satellite DCP and broadcasts. Push systems are the most appropriate approach for both the routine collection of observations and the routine dissemination of observations and other products. However, the collection of observations from the many possible suppliers and dissemination of products from a few suppliers to many recipients are different problems best met through different logical topologies. Furthermore, distribution of ad hoc non-routine products should be accomplished via request/reply or "pull" systems. The “push” and “pull” systems, operating in parallel, should be available to all users of WMO data and products.

3. The Future WMO Information System should ensure coordinated development and operation of the participating systems through reliance on international protocols and standards and off-the-shelf software.

4. The Future WMO Information System will continue to rely upon the WMO communication system to provide highly reliable and timely delivery of data and products. Currently, this requires a private network but this may change as public communications services evolve.

5. The system would define participating centres according to their functions and responsibilities. The system would include three levels of responsibilities: Global Information System Centres, Data Collection or Product Centres and National Centres. It should be noted that this is a logical description and that one physical centre could perform the functions of all of the centres defined. Likewise, several physical centres could cooperate to perform the functions of a single logical centre.

6. The flow of information between these centres is illustrated in figures 1 through 3. Figure 1 outlines the collection of observations and products, Figure 2 illustrates the dissemination of products (both routine and non-routine), and Figure 3 provides a simplified view of the various categories of information flow.

7. It is envisioned that participating centres would span a range of capabilities. Less developed centres with less demanding requirements could be successfully implemented with Personal Computers and dial-up Internet connections, provided they receive basic products via satellite. As resources and requirements increase, centres could equipped with increased capabilities as illustrated in Figure 4.

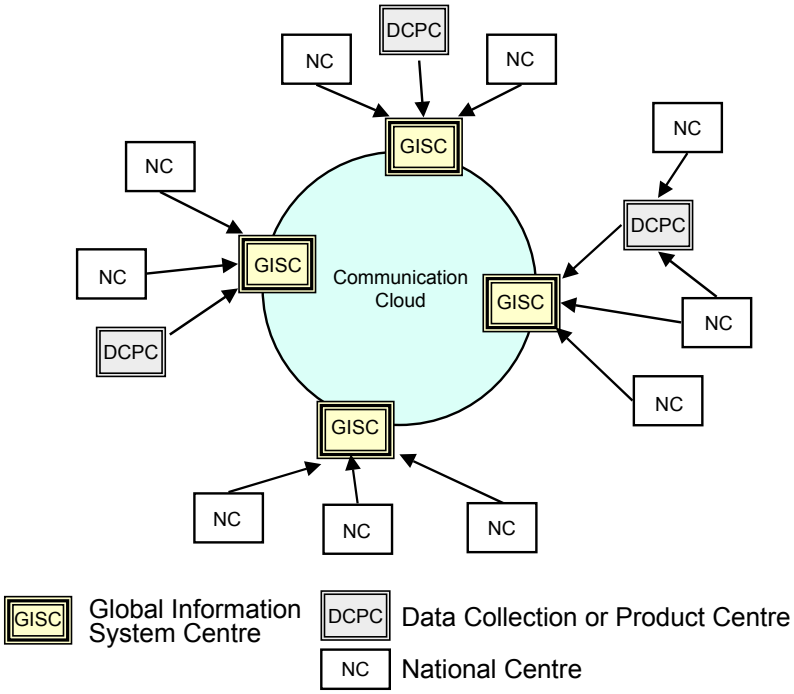

Figure 1. Information collection

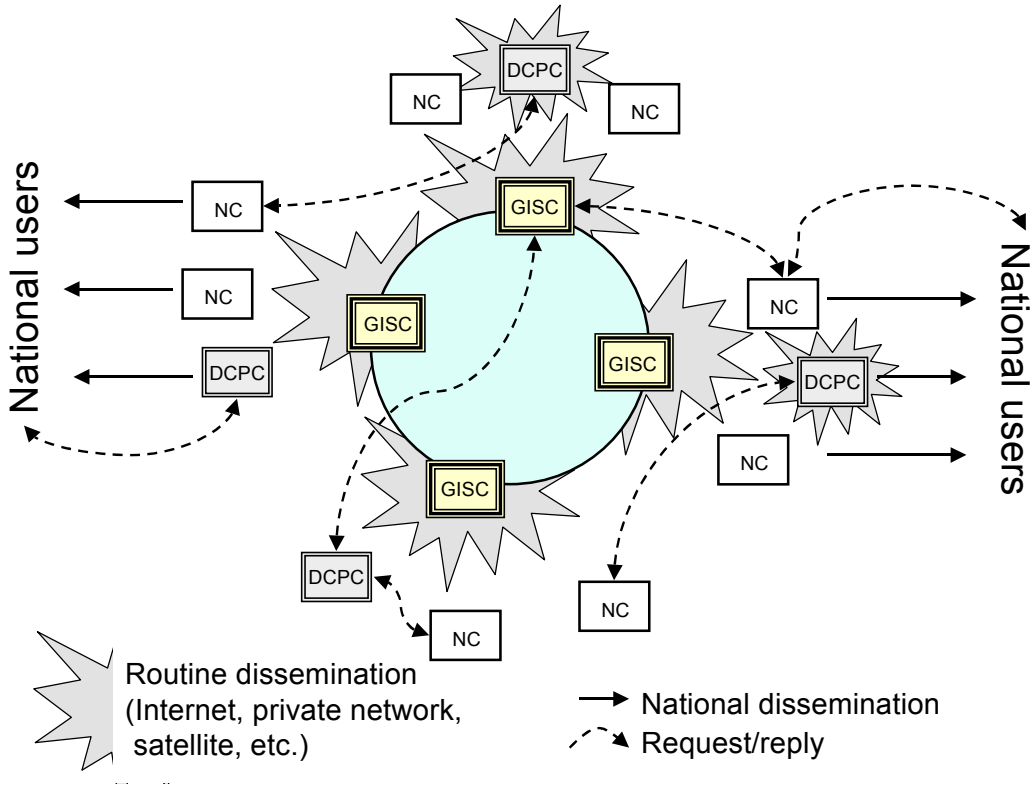

Figure 2. Information distribution

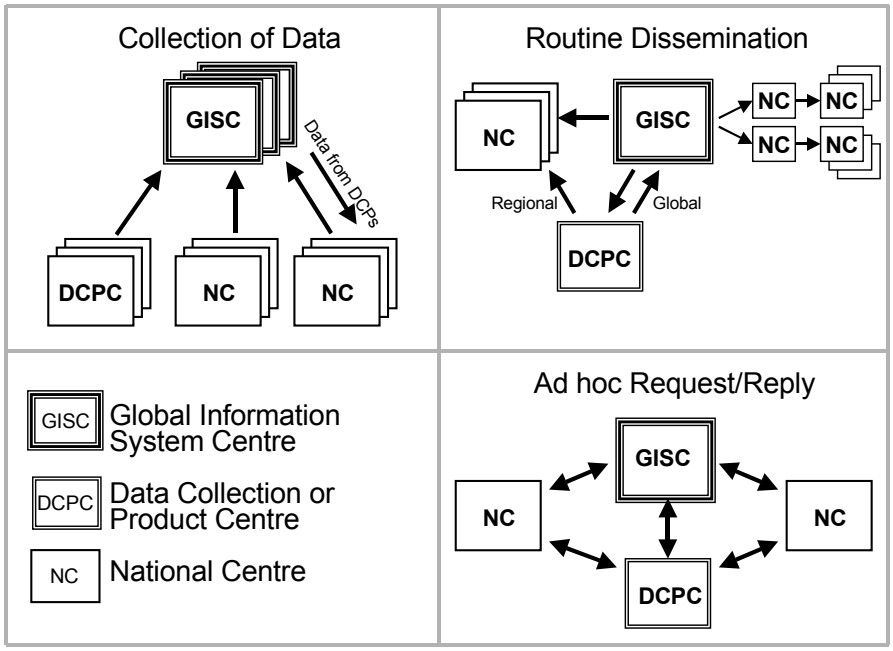

Figure 3. Overview of communication topologies

Global Information System Centres

8. Several (perhaps 4 to 10) Global Information System Centres (GISC) would form the top level of the Future WMO Information System. These centres would collect all observations and products intended for global distribution from supplying centres within their area of responsibility. Each supplier, which could be an NMHS, organisation (e.g. ARGOS, ARINC),

research project, et cetera, would send its observations to its designated GISC. Observations would be combined into large aggregated datasets. The GISC would then forward its datasets to all of the other GISCs. The collection of observations would thus be organised into a series of star networks connected by a logical ring between the GISCs at the top. It is not considered necessary to standardise the physical links and protocols to be used between all of the suppliers and collectors. These could instead be decided by bilateral agreement to best match the requirements and capabilities of the parties involved. This approach is currently used between a number of NMHS with effective results.

9. GISCs would usually be located within or closely associated with a centre running a global data assimilation system or having some other global commitment. However, the proposed architecture does not dictate that this be a requirement.

10. Dissemination of information through a store-and-forward based push system implemented as a single layer would, in many cases, require excessive resources at some centres. Therefore dissemination would probably be best addressed through a variety of technologies including hierarchical store and forward systems similar to the current GTS message switches, satellite broadcast, and perhaps network multicast. High capability recipients requiring large-volume products could be served by one mechanism while less developed recipients with less demanding requirements could be served by another.

11. The responsibilities of a GISC can be summarised as follows. Each GISC would:

a. Collect observational data and products that are intended for global exchange from national centres within their area of responsibility, reformat as necessary and aggregate into products that cover their responsible area
b. Collect information that is intended for global exchange from Data Collection or Product Centres within their area of responsibility
c. Receive information intended for global exchange from other Global Information Systems Centres
d. Disseminate the entire set of data and products agreed by WMO for routine global exchange (this dissemination can be via any combination of the Internet, satellite, multicasting, etc. as appropriate to meet the needs of Members that require its products)
e. Hold the entire set of data and products agreed by WMO for routine global exchange and make it available via WMO request/reply (“Pull”) mechanisms
f. Describe its products according to an agreed WMO standard and provide access to this catalogue of products
g. Provide around-the-clock connectivity to the public and private networks at a bandwidth that is sufficient to meet its global and regional responsibilities.
h. Provide facilities to collect observations from and deliver products to all NMHS within its area of responsibility
i. Ensure that they have procedures and arrangements in place to provide swift recovery or backup of their essential services in the event of an outage (due to, for example, fire or a natural disaster).
j. May perform the functions of a Data Collection or Product Centre and/or a National Centre.

Data Collection or Product Centres

12. Several dozen centres would serve as Data Collection or Product Centres (DCPC). Existing World Meteorological Centres and Regional/Specialized Meteorological Centres would function as DCPCs. However, many additional centres would also serve as DCPCs. This would include suppliers of special observations (e.g. ARGOS, ARINC), research projects, and centres producing products related to a specific discipline. DCPCs would:

a. Collect special programme-related data and products as appropriate
b. Collect information intended for dissemination only to NMHS within its area of responsibility (i.e. regional collections)
c. Produce agreed data and products

d. Provide information intended for global exchange to their responsible Global Information System Centre
e. Disseminate information not intended for global exchange in whatever manner is agreed upon between the centre and the users of the product
f. Provide facilities to collect observations from and disseminate products to the least developed NMCs within its area of responsibility (e.g. via e-mail)
g. Support access to its products via WMO request/reply ("Pull") mechanisms in an appropriate manner (i.e. dynamically-generated products would require around-the-clock connectivity to the Internet)
h. Describe its products according to an agreed WMO standard and provide access to this catalogue of products or provide this information to another centre with this responsibility (e.g. a GISC)
i. Ensure that they have procedures and arrangements in place to provide swift recovery or backup of their essential services in the event of an outage (due to, for example, fire or a natural disaster).
j. May perform the functions of a National Centre

National Centres

13. National Centres would form the foundation of the Future WMO Information System. Many National Centres would be part of an NMHS but others would have national responsibility for functions falling within WMO Programmes but located outside of the NMHS. The participation of the centres would be coordinated through the national Permanent Representative to WMO. National Centres would:

a. Collect observational data from within their country
b. Provide observations and products intended for global dissemination to their responsible GISC
c. Provide observations and products intended for regional distribution to the responsible DCPC
d. Collect, generate and disseminate products for national use

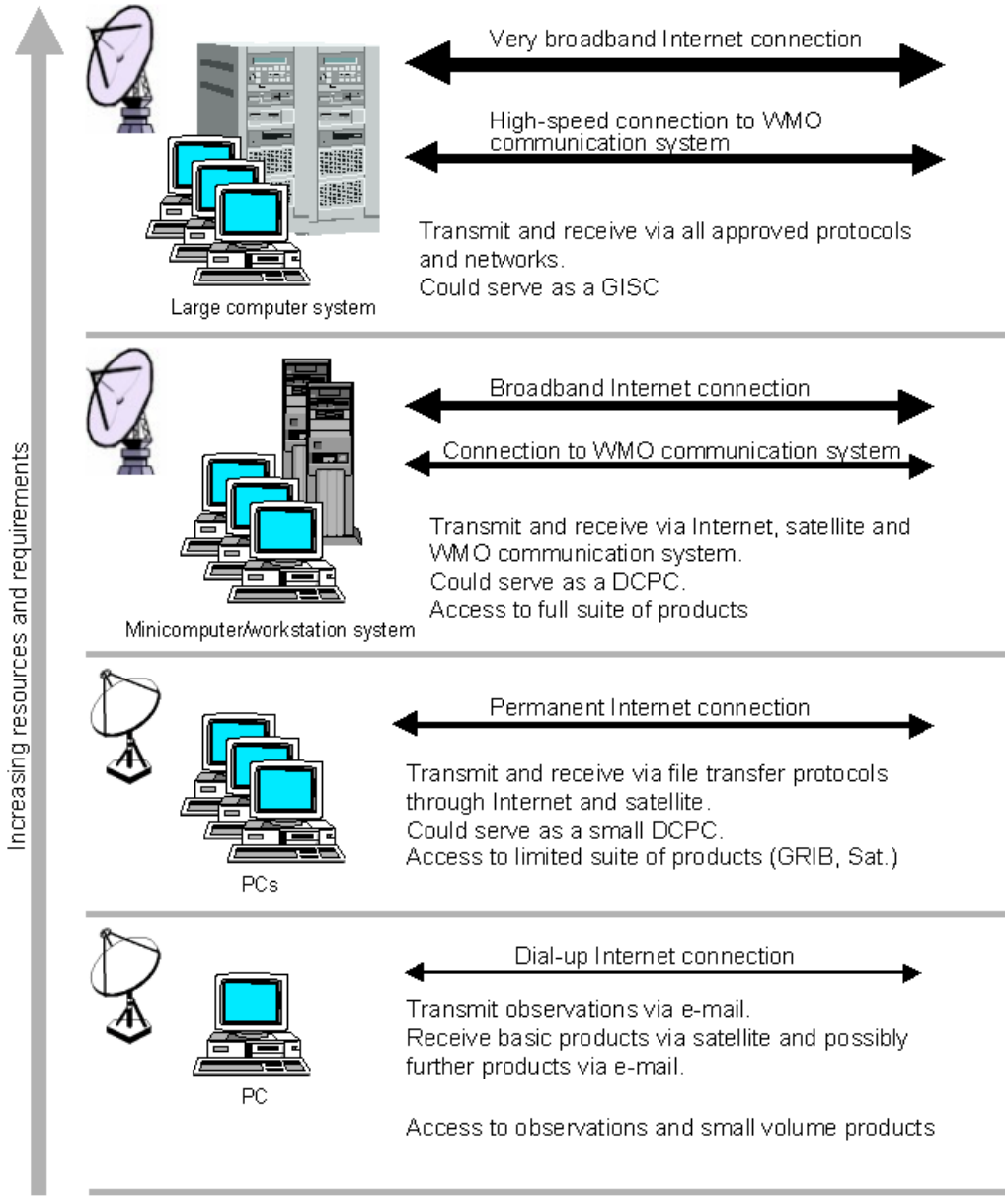

Figure 4. Capabilities of centres in response to increasing requirements

ANNEX VI

GCOS & MMS DATA REQUIREMENTS

1. INTRODUCTION

JCOMM activities in the field of data management should be based on requirements of a wide range of marine data and products users. The proper account of these demands will make it possible to formulate and take design decisions on development of efficient and end user oriented methods and tools of ocean data collection, accumulation and dissemination.

Climate model developers (in frames of GCOS requirements) and users of operative marine meteorological and oceanographic services (MMS) are expected to make the most ample use of JCOMM in the nearest future.

Requirements of the mentioned users for marine meteorological and oceanographic data and products are briefly described in the present document. Data requirements are considered in terms of parameter composition of observations/measurements and data management issues.

The materials with GOOS/GCOS data requirements [1-4] including the GOOS/GCOS Action Plan for Existing Bodies and Mechanisms [5], the output of the relevant WMO Group of Experts [6] and CEOS/WMO information base [7], which includes generalized requirements for data needed to support all the programs of WMO, GOOS and GCOS, formed the basis of the document.

Besides the results of the broad-scale survey of user requirements performed by EuroGOOS [8], the experience of the Russian Meteorological Service in the field of information support provided to marine activities were also used.

2. GCOS DATA REQUIREMENTS

The climate ocean observing system is being developed with a broad set of applications, including:

- monitoring/detection of climate change;
- seasonal-to-interannual climate prediction;
- marine and weather forecasts;
- short-range ocean forecasts;
- understanding decadal variations;
- routine ocean state estimation.

The GOOS/GCOS Action plan [4] gives a comprehensive review of the scientific issues and a set of specific data requirements. These requirements are distributed over several elements. An instrument, a platform, a transmission system, a processing required to observe a climate variable or a quantifiable aspect of the climate system is meant by the element. A brief description of existing and recommended observing systems including existing data management systems (projects) required for collection, accumulation and dissemination of data and products is given below for every group of elements

2.1. Elements

Sea Surface Temperature (SST) and Sea Surface Salinity (SST).
Observing systems - global satellite measurement of SST using AVHRR; moored and drifting buoy network measuring and reporting SST; VOS fleet measuring and reporting SST. Recommended - enhancement of the operational use of thermosalinographs on VOS and conductivity sensors on drifting buoys; satellite data systems should be improved to allow more surface platforms to report SST data more often and at lower cost.

Data management systems (projects) - CMSS, SSS (under development), GTSPP, GODAR (GODB/WA'2000), RNODC/DB. -

Surface Wind Velocity and Wind Stress:
Observing systems - meteorological observations from VOS; sea level pressure measurements from buoys; Numerical Weather Prediction (NWP); surface wind field analyses. Recommended – development of an operational scatterometer wind system, using GPS for wind measurements.
Data management systems (projects) – WMO GISCs, CMSS, RNODC/DB, CEOS, GODAE.

Surface Heat and Freshwater Fluxes.
Observing systems - Flux estimates from analyses of atmospheric observations by NWP models; marine data from VOS and drifting and moored buoys; satellite based systems for estimating radiation and precipitation.
Data management systems (projects)- WMO GISCs, CMSS, RNODC/DB, CEOS, GODAE.

Heat and Freshwater Transports and Budgets.
Observing systems - networks of river discharges; periodic occupations of hydrographic sections at ± 24° to 30° in each ocean basin for estimation of heat flux are recommended.
Data management systems (projects) - WMO GISCs

Upper Layer Temperature, Salinity, and Velocity.
Observing systems – the existing network of XBT programme, TOGA VOS and TAO networks, routine XBT sampling from polar research and supply vessels, a global network of subsurface floats (e.g., PALACE).
Data management systems (projects) - GTSPP, GODAR, Argo DM (under development).

Sea Level.
Observing systems – GLOSS network, TOPEX/POSEIDON and ERS satellite missions for precise global altimetry, TOGA tide gauge network for ENSO, future altimetric measurements.
Data management systems (projects) – GLOSS, CEOS

Sea Ice.
Observing systems – monitoring of the extent and concentration of sea ice using both passive and active microwave sensors globally and synthetic aperture radars in specific regions, utilization of satellite data in automated analyses and the incorporation of fractional ice cover and ice dynamics into global circulation models.
Data management systems (projects) – GDSIDB

Carbon.
Observing systems- existing VOS lines making pCO_2 measurements in the surface waters, with the addition of other VOS lines measuring pCO_2 and fluorescence as feasible. Long series of hydrographic, chemical, and biological measurements exist (e.g., CalCOFI, JGOFS).
Data management systems (projects) – ???

Measurements of Ocean Circulation in Relation to Climate.
Observing systems- the long-term observational networks of Japan, Russia, and other nations. Repeated sampling at regular intervals on transoceanic sections, global satellite measurement of the marine geoid is recommended.
Data management systems (projects) – GODAR, WDCs

2.2. Data management issues

Data and information management system:

i. data management system should be based where it is possible and appropriate on existing national and international systems
ii. data management system should be "operational";

iii. data management system should be consistent with the objectives, needs and priorities of the scientific design;

Effective data acquisition and communications:

i. telemetry between the sites, where instruments are located, and responsible data collection centers;
ii. timely communication of data, products and data and product analyses
iii. international standards and protocols for acquisition, processing, and distribution.

Assembly, quality control, composition and synthesis of data sets:

i. assembly of data sets by observing system variables from various data collection points;
ii. provision of effective data quality control;
iii. composed and compressed data sets from the various types of measurements for easier utilization and processing.

Establishment of a distributed system of application centers for development of value-added products as required by users.

Establishment of a robust and accessible system to collect, store, distribute and preserve information:

i. development of a data base and a permanent archive for observing system data, products and data and product analyses;
ii. maintaining a data base with information on measurement and processing methods and on calibration and validation;
iii. establishment of a Data Information Unit (DIU) for provision of details on the information management system.

Effective management and a workable information exchange policy:

i. management of the information management system and its interactions with other climate, weather, and ocean systems; and
ii. implementation of the international agreement on free exchange of information.

3. MARINE METEOROLOGICAL SERVICES (MMS)

Operative marine services provide preparation and regulated dissemination of meteorological and oceanographic information on actual and expected meteorological (air temperature, visibility, precipitation etc.) and oceanographic (sea level, wave, currents, water temperature, ice conditions etc) variables most important for marine activities. National Meteorological or Oceanographic Services (NMS) determine the amount of information to be prepared and the procedure of information transmission to users.

Taking into consideration the activities previously performed by CMM, the main MMS applications in the JCOMM context should include the following:

- development of marine broadcast system of meteorological forecasts and warnings for shipping under the Global Maritime Distress and safety System (GMDSS) of IMO;
- coastal and ocean short-range forecasting and analyses;
- further development of the Marine Pollution Emergency Response Support System (MPERSS);
- expansions to the sea ice forecasting and to support of navigation in ice covered waters.

3.1. Data requirements

3.1.1 GMDSS

The GMDSS information is provided by NMS using data collected by buoys, ships and satellites and reported in real time on broadcasts (NAVTEX and SafetyNet). These products and data include:

Warnings: the gales and storms, and tropical cyclones – type, location, direction and speed of movement, extent of affected area, wind speed and direction, sea and swell conditions and other appropriate information;

Synopsis: significant characteristics of wave conditions (sea and swell), other sea-surface conditions (drifting ice, currents, etc.);

Forecasts: wind speed or force and direction, visibility, ice accretion, where applicable;

Selection of reports from sea and land stations: position, wind, visibility, atmospheric pressure and, if possible, cloudiness, present and past weather, air and sea-surface temperatures and waves;

Radio facsimile broadcasts – graphical information.

Data management system – NMS, CES, RCC:

3.1.2. Coastal and ocean forecasting and analyses;

Operational coastal and ocean forecasting (in the range of 0 to 10 days) and analysis are required for protection of human life, property and environment, as well as for proper and efficient performance of marine operations. Examples include:

- calculation and forecast of basic wind wave parameters;
- diagnosis of basic thermal and dynamical parameters of the ocean surface layer state;
- calculation and forecast of hydrometeorological parameters for specific seas.

JCOMM has a responsibility for the analysis and forecasting of ocean waves and storm surges. Data requirements include: analyses and forecasts of atmospheric parameters by NWP models; marine data from VOS and drifting and moored buoys; data from coastal stations and satellite based systems for estimating wave conditions.

3.1.3. The Marine Pollution Emergency Response Support System (MPERSS)

MPERSS, initiated on a trial basis in 1994, continues to develop. The system can now be classified as fully operational in several parts of the world, including in particular the Mediterranean, with both simulations and real emergencies having been dealt with.

Input data requirements for marine pollution transport and dispersion models include: surface wind, air and water temperature, rain, wave conditions, ice information in form of observation/measurements and forecast and analyses fields.

Data management system – NMS, AMC

3.1.3.The sea ice forecasting and navigation in ice covered waters.

JCOMM assists in making more effective the coordination and cooperation of national sea-ice information services, principally through the Expert Team on Sea Ice of the JCOMM and through the DBCP, including its action groups, the International Arctic Buoy Programme (IABP) and the International Programme for Antarctic Buoys (IPAB).

List of sea-ice variables: stage of ice development, form, total and partial concentration, thickness and others.

Data management system the Global Digital Sea Ice Data Bank (GDSIDB) which comprises data sets for the Arctic and Antarctic areas, including data sets from the Sea of Okhotsk, the Baltic Sea and the Canadian Arctic area.

3.2. Data management issues

GMDSS:

- Improvement of information transmission: The reception of GMDSS information via Inmarsat SafetyNet has been estimated to be excellent whereas the reception via NAVTEX requires improvement. It is recognized that radio facsimile broadcasts is based on HF radio communications and must deal with all inherent problems associated with this technology, i.e. atmospheric disruptions, frequency fade and path distortion, etc.

- Improvement of information content and structuring. The inclusion of the specific comments on indicated geographic areas in GMDSS information will have a significant beneficial effect for mariners. Perfect structuring of information will allow the level of computerization in preparing information to be increased and ensure accumulation and use of information for studies and decisions in frames of relevant current marine activity including SAR.

The analysis and forecasting of ocean waves and storm surges:

- Support and facilitation in putting all types of wind wave, storm surge sea level, and wind data on the WMO GTS and/or the Internet for their open and expeditious exchange;
- Promotion of standards, identification of needs for special codes and development of the code amendments if necessary including standards for presentation of the JCOMM Wind Wave and Storm Surge Programme-related variables on the Internet;
- Improvement of identifying marine surface wind, wind wave, and storm surge data sets including those existing on the Internet (both real-time and historic), facilitation in production of metadata along with the primary data set;

MPERSS:

- Increase of *in situ* real-time data flow, including expansion of the VOS and increased automation of shipboard equipment and communications;
- Development of comprehensive delayed-mode metocean data sets for model calibration;
- Performance of regular and accurate on-site observations required during incidents to refine and update models and forecasts. Formal structures should be developed for types and procedures of such data reporting;
- Development of a global data base of long-term residual currents, as well as provision of operational access to routine current products from Topex/Poseidon. Real-time mapping of current eddies and cores is also required for spill models.
- Provision of access to high quality operational satellite wind, wave and SST data and high resolution model output fields required by MPRESS AMCs and supporting services.

The sea ice forecasting and navigation in ice covered waters:

- Development and revision of the sea ice nomenclature and terminology;
- Development of a new COUNTOUR-2 format and software to standardize the international exchange of operational sea ice data for electronic sea ice charts;
- Preparation of the historical sea ice data sets for sea ice covered areas.

4. ANALYSING THE DATA REQUIREMENTS

Requirements of GCOS and MMS applications cover a wide range of data and products on the physical state of the World Ocean. It should be noted that GCOS data requirements are highly detailed and cover all aspects of data and products specification. It is primarily due to the fact that GCOS program (design) documents determine specific applications of the system (detection of climate change; seasonal-to-interannual climate prediction and other). Demands of these applications form the basis of data requirements.

Within MMS (in their current state) GMDSS and MPERSS (partly) data requirements are similarly detailed. Other MMS applications are mainly performed by NMS, which are to a certain extent independent in choosing methods and tools of information support provided to marine activities as dictated by the technical potential of a specific country and regional features..

Marine meteorological and oceanographic variables required for GCOS and MMS applications overlap in many ways. As for geographic coverage, GCOS requirements are mainly related to the open parts of the World Ocean and MMS requirements are mainly oriented to the regional level.

Variables used as input data for GCOS and MMS applications are described as multi-level in representation and poly-discipline in obtaining.

Multi-level representation means that data collections with a various degree of processing are required and data of the previous level serves as the input flow to obtain data of the subsequent level.

For instance (based on GCOS classification):

Level 1 data are instrument readings, that are used to derive ocean variables;

Level 2 data consist of observed/measured ocean values, obtained directly from instruments or from level 1 (e.g. SST from AVHRR). There are some sublevels depending on the time of data delivery and use, the need in structural data conversions (e.g., initial buoy data – derived time series of buoy meteo data) and other requirements;

Level 3 data are products derived from analysis and forecasting of Level 2 data. Here data sublevels can also be isolated depending on the analysis specifications (statistical generalization (actually data folding), hydrodynamical simulation of fields and others), geographical resolution (regional analyses and forecasts are prepared through refinement of global analyses and forecasts) and others.

Level 4 data are products derived from further processing and interpretation of both level 3 data and the whole of data collection as applied to a specific application or region.

Multi-level collections of data should consider the following:

- timeliness, completeness and QC requirements at every level;
- the fact that data sets (streams) of data collection various levels (especially adjacent) should be linked through the relevant metadata management mechanism in terms of both history of data acquisition and processing and data tracking.

Poly-discipline obtaining means that to obtain complete meteorological and oceanographic variables prepared for utilization in GCOS and MMS applications it is necessary to use data sets (streams) generated by several (various) data collection systems (programs) and(or) data processing systems (blocks). For instance to obtain complete SST Level 2 data it is necessary to perform data processing and integration from W MO VOS, IGOSS SOOP and satellite programs.

GCOS and MMS data management requirements in general are as follows:

- data management systems should be "operational";
- international standards and protocols for acquisition, processing, and distribution of data and products (communication means, metadata, QC, data models and formats) should be developed on basis of the best practices and new developments and should be embedded in existing data management systems;

integration technology for composing, synthesis of marine meteorology and ocean data flows(sets) and distributed access to data sets should be established.

ANNEX VII

DMPA WORKPLAN

1. The mission of JCOMM Data Management Coordination Group (DMCG) is to develop a JCOMM data management strategy and submit it to the JCOMM Management Committee for approval; to realize the data management tasks according to their priorities; to discuss and determine the work plan of the JCOMM Data Management Programme Area (DMPA); and to deal with other data management issues raised during the JCOMM intersessional period.

2. A draft work plan for DMCG was reviewed by DMCG-I. This revised version of the work plan is presented by Prof. Lin Shaohua, the chairperson and coordinator DMPA,. on the basis the draft plan and the outcomes of DMCG-I.

JCOMM Data Management Coordination Group
Work Plan 2001-2005

Item	Priority	Task	By Whom	Target
IGOSS SOC	H	Review former IGOSS SOC's system and make concrete proposals for its restructuring in context of agreed JCOMM requirements, role and operations. A small ad hoc drafting group, tasked with studying the SOC's system, has been set up to provide proposals to DMCG-I. The results of the review should be informed to DMCG and the possibility that some SOCs were nationally funded to play their role as such be taken into consideration when coming to a final decision regarding the SOCs system	MAN, DMCG	JCOMM-II
ODAS Metadata	H	It was offered to host the ODAS metadata base at the National Marine Data and Information Service of China (NMDIS), WDC-D Oceanography. NMDIS will collaborate with IODE GE/TADE with their investigations into MEDI-ODAS comparisons, to further specify the characteristics of the service, and to keep them informed through the preparation of an action plan. A detailed work plan will be provided by NMDIS, China	COP, DMCG NMDIS Chairperson of DBCP	ASAP
Integrated End to End Data Management Strategy	H	Develop the strategy, and initiate and oversee the implementation of the Data Management Program Area (DMPA), and identify priorities and actions for the DMPA. The chairperson of DMCG is to lead to develop the strategy with the Chairs of ET, IODE Chair and Bruce, and consultation with MC	DMCG	Intersessional
	H	Review and assess the general requirements for end-to-end data management practices with IODE. The task team will be identified in the IOC resolution	MAN, DMCG	Intersessional
	H	Review existing operations and procedures, with the aim of developing a detailed plan for end-to-end, integrated JCOMM data management, for consideration by the Management Committee, eventually by JCOMM-II. The task team will be identified in the IOC resolution	DMCG	JCOMM-II
	H	Address concerns regarding integration between different geographic scales, and between different levels of scientific and administrative details. Key factors could be summarized and presented effectively to JCOMM. The elements are being considered and a position paper will be prepared before JCOMM-II	MAN, DMCG	Intersessional

Item	Priority	Task	By Whom	Target
	H	Consider the overall issue of end-to-end data management for ocean and marine meteorological measurements and to develop a strategy for the Commission	DMCG ETDMP	ASAP
Surface Salinity Data Management	H	Develop procedures for and coordinate JCOMM input to the pilot project of surface salinity data management	DMCG	ASAP
	H	Recommend a mechanism for effective participation on the IODE sea surface salinity pilot project	DMCG ETDMP	ASAP
	M	Thierry Delcroix of France had agreed to chair the Project. A meeting is planned (16-17 September, 2002) in Ottawa to review the draft project plan and discuss further action	Thierry Delcroix	September, 2002
ARGO Data Management	H	Review the development of Argo data management procedures and closely liaise with the Argo data management group	DMCG	Intersessional
	M	Review the progress of the Argo project with a view towards a full integration into the JCOMM overall observing system at an appropriate time	OCG, ETDMP, Argo DMSC	Intersessional
	H	A second meeting is planned for Ottawa (18-20 September, 2002) and hosted by MEDS. Work will continue on implementing the various components of the Argo Data System	MEDS	September, 2002
Monitoring Data and Information Flow	H	Develop an integrated strategy for monitoring of data flow and quality	MAN, DMCG	Intersessional
	H	Implement a mechanism with the DMPA to provide timely and accurate information on data and products	DMCG	Continuing
	H	Cooperate and work closely with the Observation Program Area (OPA) and the Management Committee, as appropriate, to design and implement a performance evaluation system. Mr. Robert Keeley was requested to act as liaison person	DMCG Mr. Keeley	ASAP
Code and Format	H	Keep under review the requirement for exchange of new oceanographic data and initiate actions for BUFR encoding and GTS distribution of new oceanographic data at the appropriate time	OCG DMCG Argo Community	ASAP

Item	Priority	Task	By Whom	Target
	H	Develop an appropriate practical solution regarding the difficulties of the on-board manual encoding of CREX messages in consultation with CBS	SOT, DMCG	Intersessional
	H	Develop a common policy and approach to the application of Code41, in particular which minimize restriction and request Mr V. Wagner, chairperson of TTSCSC and member of the ETDMP and ETMC, to report on this issue to those teams as appropriate	Mr Wagner,	ASAP
	H	Ensure appropriate JCOMM participation in CBS activities related to data exchange	MAN, DMCG	Continuing
Future WMO Information System	H	Keep the work by the Inter-program Task Team on Future WMO Information System under review, and develop specific JCOMM requirements for input to the work by the Task Team	Intercessional	
	H	Assign an expert to represent JCOMM's interests about codes and formats in Inter-program Task Team on future WMO information system, to effect liaison between CBS and JCOMM	DMCG	ASAP
	H	The chairperson of the DMCG and Dr. N. Mikhailov will represent the JCOMM on the Inter-program Task Team on future WMO information system and on the CBS Expert Team on Integrated Data Management respectively.	Chairperson of DMCG Dr. N. Mikhailov DMCG	ASAP
	H	Mr. R. Keeley (Canada) will represent the JCOMM on the CBS Expert Team on Data Representation and Codes, and the Expert Team on Migration to Table-Driven Code Forms	Mr. R. Keeley DMCG	ASAP
Metadata Exchange	H	Address the issue of an agreed standard marine metadata language for JCOMM activities, in particular, develop a strategy that takes account of the marine Extensible Markup Language (XML) consortium, of the related activities of CBS, and of the many national activities related to standard marine metadata language	DMCG	ASAP
	H	Undertake a comparative study of existing metadata systems covering both oceanography and marine meteorology (e.g. MEDI, EDMED, EDIOS, SeaSearch, …). A short project plan will be drafted by CNODC and circulated it among the coordination group as well as to relevant members of the IODE	CNODC	ASAP
	H	Regarding to XML in both oceanography (IODE) and meteorology (CBS), these bodies will closely collaborate in JCOMM framework	DMPA Coordinator Secretariat	Continuous

Item	Priority	Task	By Whom	Target
	M/H	Review the situation of oceanographic and marine meteorological data holdings in existence and propose appropriate follow up actions based on the comparative study of existing metadata system	DMCG	Intersessional
CLIMAR (Brussels Anniversary)	M/H	Establish an organizing committee for the proposed second WMO International Workshop on advances in marine climatology and convene the workshop	COP, DMCG	Prior to JCOMM-II
	M/H	Keep under review, assess and coordinate the adoption of appropriate new information technology	DMCG	Continuing
CCI	H	Provide support to CCI scientific and technical conference to be held immediately prior to the thirteenth session of CCI	DMCG, ETMC, CCI subsidiary body	Prior to Nov. 2001
	M	Assign experts to assist CCI in preparing the revised Guide to Climatologic Practices	COP, Chairperson of DMCG and ETMC	Intersessional
Ocean Information Technology	H	The DMCG approved the Ocean Information Technology (OIT) project proposal as a relevant initiative within the framework of the DMPA and identified 4 projects with their leaders to be developed as pilots for discussion during the first session of the OIT Steering Team meeting (27-29 November 2002, Brussels). Each project leader will work with the proposed team members to refine the focus of the pilots proposed and to have a proposal with clear goals, members, and milestones for the work for presentation to the MC	DMPA Coordinator 4 project leaders	November 2002
Surface Current Data	H	The chairperson of DMCG offered to host the ISDC database at the National Marine Data and Information Service of China (WDC-D Oceanography). The work plan for this hosting will be developed by NMDIS and circulated to all DMCG members	NMDIS DMCG	ASAP
Next Session of DMCG	M	The next DMCG formal meeting will be in the first half of 2004, with exact dates and place to be decided later by the chairman and Secretariat. In this context, it was pleased to accept the kind invitation of its chairperson to hold the session in China	NMDIS DMCG	First half of 2004

Working plan of Expert Team on Data Management Practices (ET DMP)

1. Work strategy for ET DMP

1.1. ET DMP responsibility

In accordance with ET DMP Terms of Reference the group should:

(i) develop, recommend and implement principles and practice of End to End Data Management (E2EDM) to be adopted by JCOMM;

(ii) consider and assess efficiency of existing and planned data management (DM) practices, and recommend the best practice and related activities to be accepted by JCOMM . Related activities include in particular :
- metadata standards and formats;
- data quality control and integration;
- flow of data and products.

ET DMP fulfils its functions through:

(iii) preparation of reviews, analyses, guiding materials and other documents, which will help JCOMM to accept the best data management practices

(iv) provision of data management consultations for Data Management Co-ordination Group (DMCG) and other JCOMM groups;

(v) preparation of proposals on establishing projects and special ad hoc groups, and in case they are established, supervision of their activities with the purpose of developing effective data management practices;

(vi) communication and collaboration with other groups to provide access to required expertise and relevant co-ordination tools, and to avoid duplication.

1.2. Basic tasks of ET DMP working plan

ET DMP working plan is based on proposals and decisions of 1-st JCOMM Session related to JCOMM Data Management Programme Area (DMPA) as well as on decisions of 1-st DMCG Session (22-25 May, 2002) and is aimed at fulfilling the following basic tasks:

(i) development of requirements to E2EDM;

(ii) review of existing and planned DM practices and preparation of recommendations on best DM practices to be accepted by JCOMM;

(iii) preparation recommendations on the use of modern information technologies and integration technology of E2EDM;

(iv) development of JCOMM E2EDM strategy and E2EDM implementation plan.

1.3. Organisation of ET DMP work

The mechanism to implement the ET DMP working plan is as follows:

(i) the working plan determines the tasks for ET for the JCOMM inter-session period of 2002-2005;

(ii) the responsibility for fulfilling the tasks (subtasks) of the working plan is distributed between the members of group and assigned to them for the whole of the JCOMM inter-session period;

(iii) the actions required to fulfil the tasks (subtasks) of the working plan are scheduled for the ET DMP inter-session period (1-2 years);

(iv) ET DMP sessions consider the results of inter-session actions, revise the tasks of ET DMP in general and specify both measures to be taken by the experts in the next inter-session period and dates on which they should be taken. The working plan is made in the assumption that, two ETDMP meetings will be organised during 2002-2003: the end of 2003 - 1-st ETDMP meeting, end of 2003 - technical ETDMP meeting (see, 90 para DMCG-1 Report).

2. ET DMP working plan

Task 1. The GOOS and MMS requirements to E2EDM

Reference: para 7.2.11. JCOMM-1, para 66 DMCG-1

Responsibility:
GCOS/OOPC – Lee Daintier
COOP – Catherine Maillard
MMS – Volker Wagner
Regional GOOS projects – Roger Djiman

Background

JCOMM activities in DM field should be based on requirements of a wide range of marine data and products users. However (following the decisions of 1-st JCOMM session) the E2EDM priority is given to the requirements of GOOS components (OOPC and COOP) and MMS (provided, in general, by HMS).

Today some documents containing requirements of users in the field under consideration have been prepared. The requirements can be divided into two groups:
1) the requirements to observation data. In this part extensive proposals are given in the OOPC [1] and COOP documents [2]. WMO Secretariat maintains WMO/IOC/CEOS data base of observational data requirements for different programme areas (or user classes) of NWP, marine services, climate prediction [3].Data requirements for operational oceanography have been prepared In EuroGOOS [4]. DMCG-1 considered the general principles of these requirements [5](this document was distributed among ETDMP members at May 2002 for remarks).
2) the requirements to DM. This problem has not received enough study yet. In the most compact form the requirements are in GOOS DM Plan [6]. In the similar documents of GCOS [7] and COOP [2] the requirements to DM are given a more general form. It should be noted that the E2EDM concept, which serves as a basis of GOOS/GCOS/COOP requirements to DM, has somewhat various approach. The document on OIT [8] provides more specific requirements to DM. As for MMS requirements to DM, so far they are not available.

There are a number of regional GOOS projects - BOOS, NE EvroGOOS, Near-GOOS (A), MFSPP, MedGOOS, BlackGOOS, PacificGOOS, IOCARIBE GOOS, which need to use real-time and delay-mode data flows to produce and disseminate diagnostic and prognostic products.

To make the design of JCOMM E2EDM reasonable it is necessary to specify more exactly the requirements to E2EDM (not only observation data) from above-mentioned programmes and projects.

Actions:
1) to analyze and give first presentation on the generalized GOOS and MMS DM requirements using existing GOOS/OOPC/COOP and MMS documents and other sources.
Deadline: Nov, 2002 (working papers submitted to ETDMP-1 meeting)

2) to revise the materials with E2EDM requirements in collaboration with OOPC, COOP and HMS and assess the GOOS and MMS DM requirements
Deadline: June, 2003 (dissemination working papers among the ETDMP members),
December, 2003 (working document "The GOOS and MMS requirements to JCOMM E2EDM " submitted on ETDMP Technical meeting

Task 2. Assistance to existing and planned data management mechanizms and practices

Subtask 2.1. Metada management systems

Reference: para 7.4.25., JCOMM-1, para 78 DMCG-1

Responsibility:
From ETDMP – Ricardo Rojas
From DMPA - Chair, Shauhua Lin

Background

In marine data management field there are exist and developed a number of metadata systems (A=active, U-under development) - MEDI (A), EDMED (A), EDIOS (A), GCMD (A), SeaSeach (U), WMO CBS metadata standard (U), which basically provide description of databases/sets being prepared and make addresses of appropriate data sources available to users (at present they provide these services without synchronization with the current state of data flows, databases/sets and products).

The important metadata management issue is to implement a mechanizm to provide integrated (for tracking flows from observation data to output product), timely and accurate information on data and product. As a whole the integration and increase of metadata systems efficiency is key problem of JCOMM E2EDM construction.

Also there is a urgent necessity of consideration new developed metadata systems which are directly related to JCOMM - WMO metadata standard and ODAS.

Actions:
1) to analyze the specifications (content and structure metadata, basic classifications, terms, codes, access and management software etc.) existing and being developed of metadata systems (MEDI, EDMED …..)
Deadline: November, 2002 (working paper with analytical analysis and recommendations, submitted to ETDMP-1 meeting)

2) to define the functions and technological issues of ODAS metadata centre activity
Deadline: November, 2002 (working paper, submitted to ETDMP-1 meeting)

3) to generalize the specifications of metadata system and to develop the technical proposals on the integration and increase of metadata systems efficiency
Deadline: June, 2003 (dissemination working paper among the ETDMP members),
December, 2003 (working document "The integration of the marine metadata management system and recommendations" submitted on ETDMP Technical meeting
work report on ETDMP Technical meeting

Subtask 2.2. The oceanographic data management

Reference: para 7.2.5., 7.2.6., 7.3.9.1. 8.2.21. JCOMM-1

Responsibility: Lee Dantzler

Background

Today a number of international programs (systems) is available , which provide operational and delayed oceanographic (temperature, salinity, current etc) data flows for various users: SOOP, IGOSS, DBCP, TIP, EOS, TAO, IODE. In the framework of GOOS these systems (except for IODE, which is responsible for data holdings) are identified as Initial Observation Systems (IOS).

IOS, basically, generate observational data flows. Subsequent data and products collection, processing, accumulation, storage and distribution (DM practices) is performed under a great number of projects and programs, most of which are organized jointly by IOC and WMO and related to JCOMM.

Depending on specifications (structure and content of data and products, geographical area) existing and planned projects and programs (A=active, U-under development) dealing with data management can be divided into several groups:

- IOC/WMO GTSPP (A), SSPP (U), Argo DM (U) projects, IODE Drifting Buoy Centre (MEDS) - providing operational and delayed data flows;
- IOC GODAR (A), MEDAR (A) projects, under which global/regional oceanographic data sets are produced, and on the basis of these sets climate products are prepared.

Above-mentioned projects provide management and delivery to the users of the same group of parameters with use of the close DM practices (technological schemes, QC procedures, codes, formats etc.). Therefore It is important to identify to ways on the integration of these oceanographic data flows, to make proposals on best oceanographic DM practices, which can be recommended to JCOMM for the use at the international and national levels.

Actions:

1) to analyze existing and planned oceanographic DM practices from the point of view of integration of technologies DM - specificity of the DM schemes, QC, dictionaries and codes, formats, software etc. .

Deadline: Nov, 2002 (working paper, including the first generalized view on the current status of JCOMM oceanographic DM practices, submitted to ETDMP-1 meeting)

2) to continue the analysis of existing and planned oceanographic DM practices and to develop the recommendations for best of them on the basis of the analysis.

Deadline: June, 2003 (dissemination working paper among the ETDMP members),
December, 2003 (document "The status of JCOMM oceanographic and marine data management and recommended best DM practices" submitted on ETDMP Technical meeting

Subtask 2.3. Marine meteo data management

Reference: para 7.4.18., 7.5.1. JCOMM-1, para 27, 32 DMCG-1

Responsibility: Volker Wagner in collaboration with Chair, ETMC

Background

The marine meteorological data management, received in frameworks of VOS program, is carried out in two projects:
1) MCSS - acquisition, accumulation and distribution of "classical" VOS data in the delayed- mode form;
2) VOSClim - acquisition, accumulation and use "classical" VOS data and a number of additional observational elements for climatic studies in real-time and delayed-mode .

The VOS marine meteorological data managed by MCSS and VOSClim should be organized under the end-to-end data management system. In this connection, there is a need to investigate ways of implementation of the integrated data management of the marine meteo both real-time and delayed-mode data and consolidation of the DM practices, carrying out same (or close) functions in MCSS and VOSClim projects.

Actions:

1) to consider the basic DM decisions in the MCSS and VOSClim projects and prepare the first proposals on DM integration - November, 2002 (ETDMP-1 meeting)

2) To develop technical decisions to implement end to end DM on basis MCSS and VOSClim DM technologies and make proposals on best marine meteo DM practices

Deadline: June, 2003 (dissemination working paper among the ETDMP members)
December, 2003 (work report on ETDMP Technical meeting)

Subtask 2.4. Satellite and spatial data management

Reference: para 57, 58 DMCG-1

Responsibility*:* Takashi Yoshida

Background

An integrated in-situ and remote sensing data is necessary to the success of GOOS and other programmes. Therefore, for JCOMM It is important to identify the coordinated procedures and standards which will provide satellite data management as integrated part of JCOM E2EDM. It requires the adjustment of interaction and cooperation with Committee on Earth Observation Satellites (CEOS) which has led the development of an Integrated Global Observing Strategy (IGOS). IGOS partners have prepared Data and Information Systems and Services (DMSS) principles related end-to-end process from collecting satellite data to providing product.

It is known, that the essential part of satellite data management is connected to processing, accumulation and analysis of the so-called spatial data in graphic (Jpeg, Gif etc.) and vector (shp ESRI, S57 etc.) formats. And the usually joint processing of spatial data and in-situ of the data is carried out with GIS use. In this connection, important E2EDM aspect is to consider the management spatial data - remote sensing data and data derived from in-situ observations - thematic climatic, prognostic, diagnostic fields.

In this context, it is necessary to collaborate with the IGOS partners to insert satellite data block in JCOMM E2EDM as well as JCOMM Expert Team on Sea Ice (ET SI), which has deal with space-oriented information management issues (representation of thematic ice fields in a vector form and digital form) under the GDSIDB project.

This DM aspect is also important for development of GIS applications providing joint representation of data and products in the form of digital sets and spatial (geo-related) information (e.g. applications for inter-comparison and geo-analysis of climatic (diagnostic and prognostic) water temperature field and results of current water temperature observations). The moist important issues of spatial DM are the unification of parameter codes for spatial and digital data, review the status of GIS (Web map server, dynamic visualization of thematic shapes on electronic map etc.) and spatial data use in DM practices related to JCOMM E2EDM.

Actions:
1) to analyze IGOS DMSS principles and prepare proposals on satellite data block of JCOMM E2EDM as well as and ETSI experience on management digital and spatial data under GDSIDB project and others existing practice on presentation of the spatial marine data, including GIS issues.
Deadline: Nov, 2002 (working paper, submitted to ETDMP-1 meeting)

2) to prepare the technical proposals on: 1) satellite data management under JCOMM E2EDM; 2)joint management of the digital and spatial data and Web-based GIS functions related JCOMM E2EDM
Deadline: June, 2003 (dissemination working paper among the ETDMP members),
December, 2003 (work report on ETDMP Technical meeting

Subtask 2.5. Management of non-physical data

Reference: para 71 DMCG-1

Responsibility: Catherine Maillard

Background

Most of existing and planned DM practices provide collection, accumulation and dissemination data and products reflecting hydrometeorological, hydrological and hydrophysical conditions of marine environment

(appropriate variables are called physical variables). Relevant DM practices were discussed and accepted under GODAR and MEDAR projects. At the same time, management of data on chemical marine conditions, marine pollution and biology (non-physical variables) is very important for COOP especially for the coastal area management tasks.

Therefore It is important identify the issues and prepare the proposals on management of non-physical (chemical, biological and etc.) data in the interests of JCOMM. This activity should be carried out in close cooperation with JCOMM Reporter, Dr. Tony Knapp.

Actions:
1) to analyze experience GODAR and MEDAR and prepare generalized issues on non-physical data management
Deadline: Nov, 2002 (working paper, submitted to ETDMP-1 meeting)

2) to prepare the technical proposals on not physical data management related to JCOMM activity taking account of the COOP DM requirements (see, task 1.)
Deadline: June, 2003 (dissemination working paper among the ETDMP members),
December, 2003 (work report on ETDMP Technical meeting

Task 3. Development of JCOMM E2EDM Strategy and E2EDM integration technology

Subtask 3.1. Development of the JCOMM E2EDM Strategy

Reference: para 7.5.1. JCOMM-1, para 90,91 DMCG-1

Responsibility*:* Nicolay Mikhailov

Background

Document «The E2EDM Strategy» (N. Mikhailov), the containing first view on conceptual approach to E2EDM, was disseminated among the members ETDMP in May, 2002 before DMCG-1 meeting. This document was briefly considered on SGXML and GETADE-IX meetings (Helsinky, April, 2002). On DMCG-1 meeting (Paris, May, 2002) It was recommended to create a small *ad hoc* group, made up of the chairs ETDMP (chair of the *ad hoc* group), ETMC and IODE and Mr Keeley, would work by correspondence to combine the ideas and decisions into a single consolidated draft strategic plan, for submission to the ETDMP, the DMCG and the JCOMM Management Committee

Actions:
1) to combine the ideas and views and develop the approach to E2EDM and conceptual E2EDM definitions using GOOS and IOC/WMO design documents, discussion results during SGXML, GETADE-9, DMCG-1 meetings.
Deadline: September 2002 (working paper disseminated among the ETDMP, Ad hoc E2EDM group, DMCG members)

2) to prepare the consolidated JCOMM E2EDM Strategy (first version)
Deadline: November 2002 (working paper, submitted to ETDMP-1 meetings)

4) to finalize JCOMM E2EDM Strategy, using the proposals and remarks from ETPMP, DMCG, OIT ST sessions and basic design proposals of OIT pilot project, and develop JCOMM E2EDM Implementation plan.
Deadline: June, 2003 (dissemination working paper among the ETDMP members),
December, 2003 (work report on ETDMP Technical meeting

Subtask 3.2. Design of the JCOMM E2EDM integration technology

Reference: para 7.5.1., 7.4.29., 7.4.34., rez. 16/4 JCOMM-1, para 90,91 DMCG-1

Responsibility: Nicolay Mikhailov, Catherine Maillard, Kim Finney

Background

According to the DMCG-1 decisions the ETDMP should prepare a technical document regarding the integration technology to be used within the JCOMM E2EDM. E2EDM integration technology should to be directed on realization JCOMM E2EDM Strategy (see, subtask 3.1.) and to be based on existing and planned DP practices (see, subtask 2.1.), as well as the new Web-oriented informational technologies.

For development of the technical document It should be taken into account the current experience, initiatives and prospects of the various groups (organizations) (ICES/IOC SGXML, DODS/VODC, WMO CBS ET/IDM and EGOWS, MEDS, US Navy (OMF), Australian HMS (FichOnline) etc.) in field of the advanced technologies of marine DM management of a various level: the centralized access, metadata, data and production exchange, distributed information systems.

Actions:
1) To prepare the review existing and planned systems, technologies and other tools being developed with application of the new information technologies, including XML. To develop the conceptual decisions on JCOMM E2EDM integration technology
Deadline: November 2002 (working paper, submitted to ETDMP-1 and OIT ST meetings)

3) To develop basic design decision on JCOMM E2EDM integration technology in close cooperation with Inter-Programme Task Team on Future WMO Information System, WMO CBS ET/IDM, ICES/IOC SGXML
Deadline: June, 2003 (working document submitted to ETDMP, DMCG and above-mentioned groups)

4) to finalize basic design decisions on JCOMM E2EDM integration technology
Deadline: December, 2003 (working document submitted on ETDMP technical meeting)

Subtask 3.2. Participating in OIT pilot project

Reference: para 7.4.43 JCOMM-1, para 52-56 DMCG-1

Responsibility: **Nicolay Mikhailov, Catherine Maillard, Kim Finney**

Background

The DMGC-1 approved the Ocean Information Technology Project proposal as a relevant initiative within the framework of the JCOMM DMPA and identified four components to be developed as "pilots" (work packages - Common protocols, Data serving, Data standards for XML and study of relevant technology, Telecommunication and computer technology study) for discussion during the first session of the OIT Steering Team (27-29 November, 2002, COD, Brussels).

ETDMP was invited to organize planning and realization two work packages - Data serving, Data standards for XML and study of relevant technology). The participation ETDMP in OIT Pilot Project should be considered as range for testing the design decisions developed for JCOMM E2EDM Strategy and JCOMM E2EDM integration technology.

Actions:

1) to develop the proposals on OITPP Work packages Data serving, Data standards
Deadline: October 2002 (working document submitted to ETDMP and DMCG for first consideration)

2) to develop technical specifications of OITPP work packages and their representation on ETDMP session or/and OIT Steering Team

Deadline: November 2002

3) realization of IOTPP Work packages, including representation of intermediate results of work packages realization on ETDMP technical meeting
Deadline: December, 2003 (working document submitted to OIT ST, ETDMP, DMCG and other groups for consideration on technical meeting)
2003 - (according to OIT PP plan)

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REFERENCES

1. Global Physical Ocean Observations for GOOS/GCOS, An Action Plan for Existing Bodies and Mechanisms, August 1999
2. Integrated Strategic Design Plan for the Coastal Module of GOOS. COOP III version, 2002
3. CEOS/WMO on-line base of information. User observational requirements
4. Operational Oceanography: Data Requirements Survey, EvroGOOS Publication No 12, February, 1999
5. GCOS and MMS Data Requirements. DMCG-1/14, May, 2002
6. GOOS, Data and Information Management Strategy and Plan, June 2001
7. GCOS/GOOS/GTOS Joint Data and Information Management Plan, Version 1.0, May 2000, GCOS – 60/GOOS – 70/WMO/TD No. 1004
8. An Ocean Information Technology Project. DMCG-1/28, May, 2002
3. Scientific Design for the Common Module of the Global Ocean Observing System and the Global Climate Observing System: An OCEAN OBSERVING SYSTEM FOR CLIMATE, OOSDP, 1997
5. Final Report, CBS Open Programme Area Group on Integrated Observing Systems, Expert Team on Observational Data Requirements and Redesign of the GOS, Geneva, June 2000
6. CEOS/WMO on-line base of information. User observational requirements

Circular letter No. 2/02

From: Chairperson of the JCOMM Expert Team on Marine Climatology

Subject: Implementation of Expert Team tasks
Action required: To start realization on assignment tasks and to report to chairman of the ET on progress priori to the ETMC meeting planned in May 2004.

Dear Colleague,

In reply to the Circular letter No. 1/02 with preliminary list of tasks, which should be completed by the Team in the intersessional period I got comments and proposals from some group's members.

Data Management Coordinating Group discussed all problems related to ETMC activity on its first meeting in May 2002 in Paris. Some new tasks have been added.

In results the final version of ET work plan has been created and persons responsible for realization have been identified. The final version of our work plan can be found in the annex to this letter.

I would be thankful if you could start your job. In case of any problem don't hesitate to contact me. My e-mail address is as follow: mietus@imgw.gdynia.pl

Sincerely yours

Miroslaw Mietus
Chairman, ETMC

List of tasks

1. Finalize the International maritime Meteorological Archive (IMMA) format with a view to eventual submission to the Commission for formal adoption.

Assignment: Mr. Scott D. Woodruff (USA), rapporteur

2. Metadata are as important as the data themselves. It was recommended to verify if all the WMO Manuals on Codes (WMO-No 306) and IMMT formats documenting the history of the marine ship codes and exchange formats are available. This task was previously considered and reported to the 8th Session of Subgroup on Marine Climatology by Ms. Teruko Manabe (Japan), but was not finalized. Therefore JCOMM-I decided to continue the study to verify the availability of documentation relating to the history of marine ship codes.

Assignment: Mr. M. Kaneda (Japan) + Mr. S.D. Woodruff (USA) and Secretariat

3. Under auspices of the former Subgroup on Marine Climatology some action has been taken to compile a catalogue of global storm surge data holdings. Taking into account that substantial amounts of storm surge data are archived in a number of countries, there is some interest in a global catalogue of data holdings. There is also some interest in the eventual international exchange of these data. There is thus a need to reactivate and finalize the compilation of a catalogue of global storm surge data holdings and work closely, working closely with IODE and also with ITSU. Data Management Coordinating Group agreed that storm surge datasets should be duly included in the comparative study of existing metadata systems.

Assignment: Mr. A. Vorontsov (Russian Federation), Mr. J Carreno Campos (Chile) + Secretariat

4. Review and assess the climatological elements of the Commission, including the operation of the MCSS, and the development of required oceanographic and marine meteorological products.

Assignment: Dr. Miroslaw Mietus, Dr. C. Tam (Hong Kong, China) + Secretariat

5. Investigate the possibility to re-establish global wave metadata archive center.

Assignment: Action will be taken after contact with Mr. Val Swail (Canada) chairman of the ET on Wind Waves and Storm Surges + Secretariat

6. Keep under review and propose procedures for the preparation and/or updating of relevant technical publications.

Assignment: Mr. A. Lal, Ms. C. Rossler and Mr. K. Wurodu (Ghana)

7. Provide support to CCl and assign experts to assist CCl in preparing the revised Guide to Climatological Practices.

Assignment: Dr. Miroslaw Mietus, Secretariat and the Management Committee of CCl.

8. Continue with the digitization of non-electronic earlier versions of WMO-No. 47.

Assignment: Secretariat and Mr. S.D. Woodruff (USA)

9. Recent version of TurboWin automatically converts wind speed to the standard level of 10m. This may affect now existing databases by causing inhomogeneity if climatological marine data will be used without information concerning version of TurboWin software (available since 1st January 2003 from IMMT-2). However information on reduction of wind speed is not automatically available from IMMT-2 records. Therefore it is essential do recognize the scale of this problem and eventually to initiate appropriate changes in used software.

Assignment: Mr. Fritz Koek (Netherlands)

10. Keep under review IMMT format and MQCS

Assignment: Dr. Volker Wagner (Germany) + Mr. Chris Hall (UK)

11. Participate in the work of the organizing/scientific committee of the Workshop on Advances in Marine Climatology – CLIMAR-2 (Brussels, late 2003).

Assignment: D. Dehenauw (Belgium), D.E.Harrison (USA), M. Mietus (Poland), D. Parker (U.K.), V. Swail (Canada), S. Woodruff (USA), T. Manabe (Secretariat)

12. The Workshop on Advances in the Use of Historical Marine Climate Data has been held in Boulder (USA), 29 Jan.-1 Feb. 2002. The recommendation from the Working Group on Mean sea level pressure and wind (WG3) is to adjust the wind force data back to about 1854 using an improved equivalence scale (most likely the implementation should produce a separate field, so that the present WMO 1100-based values can still be archived and made available).

Assignment: Dr. Ralf Lindau (Germany) - external expert, S.D. Woodruff (USA)

13. The Data Management Coordinating Group on its first meeting in Paris (22-25 May 2002) agreed that MCSS is an important and highly developed system of marine meteorological data management with a distributed structure. However, there is a lack of a so called “route map” for users looking for data and assistance. This element was considered as very important and to be implemented as soon as possible.

Assignment: Dr. Miroslaw Mietus (rapporteur), representatives of RMs, GCCs and Secretariat

Annex VIII

Action Sheet on decisions of DMCG-I

Ref.	Subject	Action proposed	Resp.	Target date	Comments
para. 10	**JCOMM logo**	To provide the Secretariat with suggestions	DMCG members	ASAP	
para. 15	**JCOMMOPS**	To review of the planned development of JCOMMOPS	chairs of DMCG, ETDMP and ETMC	as needed	
para. 18	**ETDMP**	To invite IODE to co-sponsor the ETDMP instead of establishing and activating a new body	MAN, Secretariat	next IODE session	
para. 27	**MCSS**	1. To implement a "route map" for users looking for data and assistance	ETMC	ASAP	
para. 28		2. To investigate the feasibility of including both real-time and delayed-mode data	ETMC	ASAP	
para. 29		3. To investigate the feasibility of including oceanographic climatology into its work plan	ETMC	continuous	
para. 36	**SOCs**	1. To inform the DMCG of the results of the SOC review	Secretariat	ASAP	
		2. To take funding questions into consideration when deciding on the future of SOCs	*ad hoc* group, DMCG, MAN	as necessary	
para. 56	**OIT**	To develop the pilot projects as outlined	all concerned	Sept. 2002	
para. 58	**Sea ice data**	To take advantage of the experience of the ETSI on the integration of different types of data	DMCG, ETDMP	continuous	
para. 71	**Non-physical data**	To develop proposals on how JCOMM could fulfil non-physical data management requirements of GOOS	Dr Maillard & al.	Feb. 2003	

Ref.	Subject	Action proposed	Resp.	Target date	Comments
para. 74	**Code 41**	To report to ETDMP and ETMC on the work of the Task Team on Satellite Communications System Costs	Mr Wagner	as needed	
paras. 78, 103 & 109	**Existing metadata systems**	1. To undertake a comparative study of existing metadata systems (covering both oceanography and meteorology), including GOSIC & storm surge data sets	WDC-D	ASAP	
		2. To draft a project plan for that study and circulate it to DMCG & IODE	Prof Lin	ASAP	
para. 85	**XML**	1. To send comments and suggestions for expanding the draft list of keywords for WMO datasets	DMCG members	ASAP	
para. 86		2. [see para. 56, 3rd pilot]			
para. 89	**Monitoring**	1. To design and implement a performance evaluation system	DMCG	ASAP	
		2. To liaise with OCG re. performance indices	Bob Keeley	when feasible	
para. 90	**Strategy for E2EDM**	1. To submit in writing any consideration on the topic	DMCG members	Aug. 2002	
		2. To prepare a consolidated draft strategic plan	*ad hoc* group	Dec. 2002	
		3. To prepare a technical document on integration technology	ETDMP	mid-2003 & end 2003	
para. 91		4. To assist in the above	proposed IOC TT	if & when established	
para. 97	**ODAS metadata base**	1. To host the ODAS metadata base	WDC-D	ASAP	
		2. To provide details about the client service requirements that hosting the ODAS database would entail	Prof. Lin	ASAP	

Ref.	Subject	Action proposed	Resp.	Target date	Comments
		3. To collaborate with IODE GETADE to further specify the characteristics of the service and to keep DMCG informed through the preparation of an action plan	Prof. Lin	as long as necessary	
para. 99	**Relationship with CBS**	To participate in the work of relevant CBS subsidiary bodies and other WMO groups	Designated JCOMM reps. & alternates	continuous	
para. 100	**Guide to Clim. Practices**	To assist CCl in preparing appropriate sections of the revised Guide	ETMC	ASAP	
para. 104	**Existing data holdings**	To cooperate with IODE in these matters	DMCG, IODE	continuous	
para.106	**Surface current data**	1. To host the ISCDC database	WDC-D	ASAP	
		2. To provide details about the client service requirements that hosting the ISCDC database would entail	Prof. Lin	ASAP	
para. 107		3. To undertake efforts to integrate the many existing sources of surface current data	DMCG	continuous	
para. 109	**Storm surges**	To make a survey on storm surge data archival	ETMC, with IODE & ITSU	ASAP	
para. 110	**Information**	To ensure that information on any metadata, data, information or product developed by JCOMM is posted on all relevant web sites and other publications	Secretariat	continuous	
para. 112	**International Workshop on Advances in Marine Climatology**	To organize for the Workshop & report to the Management Committee	Scient. Org. Com.	periodically	
para. 114	**Next session**	1. To define place and dates	Chair, Secretariat	mid-2003	

Ref.	Subject	Action proposed	Resp.	Target date	Comments
		2. To prepare for the session	Secretariat	end 2003 - early 2004	

Annex IX

List of acronyms and other abbreviations

AMC	Area Meteorological Coordinators (MPERSS)
Argo	*[Not an acronym]*
AIC	Argo Information Centre
AVHRR	Advanced Very High Resolution Radiometer
BCDMEP	Biological and Chemical Data Management and Exchange Practices (IODE)
BUFR	Binary Universal Form for Representation of meteorological data
CalCOFI	California Cooperative Fisheries Investigation
CBS	Commission for Basic Systems (WMO)
CD	Compact Disc
CD-ROM	CD - Read Only Memory
CEOS	Committee on Earth Observation Satellites
CES	Coast Earth Station (Inmarsat)
CMM	Commission for Marine Meteorology (WMO) [*superseded by JCOMM*]
COADS	Comprehensive Ocean Atmosphere Data Set
COOP (GOOS)	Coastal Ocean Observations Panel (GOOS)
CREX	Character Extended code
DAC	Data Assembly Centre
DBCP	Data Buoy Cooperation panel
DMCG	Data Management Coordination Group (JCOMM)
DMPA	Data Management Programme Area (JCOMM)
DVD	Digital Versatile Disk
EC	Executive Council
ECMWF	European Centre for Medium-range Weather Forecast
EDIOS	European Directory of the Initial Ocean-observing Systems
EDMED	European Directory of Marine Environmental Data
ETDMP	Expert Team on Data Management Practices (DMPA)
ETMC	Expert Team on Marine Climatology (DMPA)
ETSI	Expert Team on Sea Ice
FWIS	Future WMO Information System
G3OS	Global Observing Systems (GCOS-GOOS-GTOS)
GCC	Global Collecting Centre (VOS)
GCOS	Global Climate Observing System
GDAC	Global Data Assembly Centre (Argo)
GDSIDB	Global Digital Sea Ice Data Bank
GE	Group of Experts
GLOSS	Global Sea-Level Observing System
GMDSS	Global Maritime Distress and Safety System (IMO)
GODAE	Global Ocean Data Assimilation Experiment
GODAR	Global Ocean Data Archeology and Rescue (IODE IOC)
GOOS	Global Ocean observing System
GOS	Global Observing System (WMO)
GOSIC	Global observing Systems Information Centre
GPCP	Global Precipitation Climatology Project (WCRP)
GPS	Global Positioning System
GRIB	Processed data in the form of grid-point values expressed in binary form
GTOS	Global Terrestrial Observing System
GTS	Global Telecommunication System (WMO)
GTSPP	Global Temperature Salinity Profile programme
ICES	International Council for the Exploration of the Sea
IABP	International Arctic Buoy Programme
IPAB	International Programme for Antarctic Buoys
IFREMER	Institut français de recherche pour l'exploitation de la mer

IGOSS	Integrated Global Ocean Services System (IOC-WMO) [*superseded by JCOMM*]
IMO	International Maritime Organization
IMMT	International Maritime Meteorological Tape
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IODE	International Oceanographic Data and Information Exchange (IOC)
IPSec	Internet Protocol Security
ISO	International Organization for Standardization
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM *in situ* Observing Platform Support Centre
MAN	Management Committee (JCOMM)
MCSS	Marine Climatological Summaries Scheme
MEDI	Marine Environmental Data Information Referral Service
MMS	Marine Meteorological Services
NCDC	National Climate Data Centre (NOAA)
NESDIS	National Environmental Satellite, Data and Information Service (USA)
NOAA	National Oceanic and Atmospheric Administration (USA)
NODC	National Oceanographic Data Centre
NWP	Numerical Weather Prediction
OCG	Observations Coordination Group (JCOMM)
OIT	Ocean Information Technology (project)
OOPC	Ocean Observations Panel for Climate
OOSDP	Ocean Observing System Development Panel
OPA	Observations Programme Area (JCOMM)
OWS	Ocean Weather Station
PA	Programme Area (JCOMM)
QC	Quality Control
RCC	Rescue Coordination Centre
RMTC	Regional Meteorological Training Centre
RNODC/DB	Responsible Oceanographic Data Centre for Drifting Buoys (MEDS, Canada)
SCG	Services Coordination Group (JCOMM)
SEA-SEARCH	*[Not an acronym]* [see http://www.sea-search.net/)
SOC	Specialized Oceanographic Centre (IGOSS)
SOOP	Ship of Opportunity Programme
SOT	Ship Observations Team (OPA)
SSS	Sea Surface Salinity
SST	Sea Surface Temperature
TOGA	Tropical Ocean and Global Atmosphere
UN	United Nations
UNESCO	UN Educational, Scientific and Cultural organization
VOS	Voluntary Observing Ships
VOSClim	VOS Climate (project)
VPN	Virtual Private Network
WCRP	World Climate Research Programme
WDC	World Data Centre
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment
WWW	World Weather Watch (WMO)
XML	Extended Markup Language