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Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology

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FINAL REPORT

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N O T E

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C O N T E N T S

GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION

1.1 The sixth session of the Management Committee of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was called to order at 09.00 hours on Monday, 3 December 2007, in conference room XV of the UNESCO headquarters in Paris, by the Commission Co-President, Dr Jean-Louis Fellous. Dr Fellous welcomed participants to the session, and introduced the Executive Secretary of IOC, Dr Patricio Bernal and Dr Dieter Schiessl of WMO.

1.2 On behalf of the IOC and WMO, Dr Bernal welcomed participants to the session, to IOC of UNESCO, and to Paris. He noted that JCOMM has proved its value by integrating the meteorological and oceanographic communities to meet the challenges of operational oceanography. He emphasized the challenges that JCOMM is addressing to help support the national and international infrastructure necessary to maintain and improve marine environmental and safety services, and in doing so, highlighted the importance to sustain and integrate observing networks.

1.3 Dr Bernal then informed the Committee of the planning process for the IOC Biennial Strategy for 2008-2009, with four high-level objectives including i) prevention and reduction of the impacts of natural hazards; ii) mitigation of the impacts and adaptation to climate change and variability; iii) safeguarding the health of oceans ecosystems, and; iv) management procedures and policies leading to the sustainability of coastal and ocean environment and resources. He reminded the Committee that all UN work plans were being designed to take into account the implications of climate change and adaptation. Noting that we must strengthen our efforts to understand the science of climate change, and highlighting sea level change, Dr Bernal again insisted on the importance of completing and sustaining the initial design of the ocean observing system. Observations are critical to the knowledge necessary for adaptation to climate change, and he encouraged the full support of all Members / Member States in this regard.

1.4 Dr Bernal concluded in assuring the Committee of the full support and engagement of the IOC, throughout the session and beyond. He wished the participants a successful meeting and a pleasant stay in Paris.

1.5 Dr Dieter Schiessl, Director, Strategic Planning Office and Coordination of Cross-cutting Activities, spoke on behalf of the WMO. He briefly introduced the process for WMO Strategic Planning 2008-2011 and its Operational Plan, which were discussed in detail under agenda item 3.5. Changes were also foreseen in the WMO Secretariat structure that would influence the future JCOMM implementation. Dr Schiessl reaffirmed that the Commission will continue to be fully supported by the WMO Secretariat.

1.6 Dr Schiessl also acknowledged the active role of JCOMM in the development of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS), and noted that JCOMM would further enhance integration with other observing systems through this process. He then emphasized the requirements of the WMO Members to JCOMM

on weather and disaster risk reduction services, and encouraged the Committee's efforts in this area. He concluded his remarks by wishing everyone a successful meeting.

1.7 The Committee then adopted its agenda for the session as reproduced in Annex I. The Committee agreed its hours of work and other practical session arrangements.

1.8 The list of participants in the session is given in Annex II.

2. REPORTS

2.1 The Committee noted with appreciation the report by the joint Secretariat on activities undertaken during the year since MAN-V in support of the implementation of the work plan of the Commission or relevant to its overall mandate. The report also covered other activities in both WMO and IOC in which JCOMM was involved, or which impacted on the work of the Commission, as well as significant events planned for the coming year.

2.2 The Committee noted with appreciation the report by the Co-Presidents of JCOMM, Dr Jean-Louis Fellous and Dr Peter Dexter, covering the major activities of the Commission since MAN-V, including in particular those in which they had been directly involved, as well as priority issues and activities for the remainder of the intersessional period. Specifically, the report covered: major JCOMM events; partnerships; other significant external interactions; meetings of the WMO and IOC Governing Bodies; communications, outreach and strategic development; coming major events; priorities for the remainder of the current intersessional period; the JCOMM review; funding and Secretariat support. In the report, the Co-Presidents put particular stress on those issues which would require the attention of the Committee during the meeting, and also underlined the importance of all Committee members contributing, both to the debates during the meeting, and also directly to the implementation of specific work assignments during the remainder of the intersessional period. They concluded by thanking the Secretariat for its support, noting that, at the midway point of the current intersessional period, and despite ongoing funding shortages and a general work overload for Commission volunteers, the Commission was in a reasonable shape in the implementation of its work plan and the preparation of concrete decisions and recommendations for JCOMM-III.

2.3 Detailed discussion on the activities and points raised in both reports are recorded under relevant agenda items in this document.

3. PREPARATIONS FOR JCOMM-III

3.1 Pas PLAN OF ACTION AND DELIVERABLES

3.1.1 Observations Programme Area

3.1.1.1 The Committee noted with interest and appreciation the report of the Observations Programme Area (OPA) Coordinator, Mr Mike Johnson, on OPA issues and opportunities. The status of the observing system is now at 59% of the GCOS-92 Implementation Plan targets. The phased implementation plan, as presented at JCOMM-II, projected that the system would be at 66% by now. The nations are falling behind in their contributions to system implementation. The OPA needs to revise the implementation targets and continue to

advocate for additional national commitments; the system cannot be fully implemented and sustained at the present level of commitments.

3.1.1.2 Despite overall slowing of system implementation, two system elements have achieved their initial design targets: the global surface drifting buoy array reached 1250 data buoys in sustained service in 2005, and the Argo array reached 3000 active floats in 2007.

3.1.1.3 GCOS-92 remains as the foundation roadmap guiding the OPA work plan. Subsequent to the issuance of GCOS-92, three additional challenges have arisen that are now influencing the global implementation strategy – coordination with the international tsunami warning system, the International Polar Year, and the regional GOOS networks.

3.1.1.4 Mike Johnson called attention to the OPA report (document MAN-VI/3.1(1)), which details the work that has been accomplished by implementation panels and the Observations Coordination Group. Items for discussion by the Management Committee under separate agenda sessions included: the solicitation for Letters of Intent to establish an Observing Programme Support Centre (Agenda 4.4), and the catalogue of technical standards (Agenda 4.2).

3.1.1.5 A third version of the web tool Observing System Monitoring Centre (OSMC) was now posted on the web[1] and included some performance monitoring of variables. The **Committee agreed** that use of this tool is to be widely encouraged.

3.1.1.6 The SPA had compiled a list of observational requirements for the provision of JCOMM products and services, and the OPA hoped to respond to this initial document in spring 2008.

3.1.1.7 JCOMM-II had requested a review of JCOMMOPS. Johnson recommended that the analysis of the work at JCOMMOPS, in preparation for considering the new Observing Programme Support Centre (OPSC), in actual fact constituted a thorough review. This review had established the value and need for JCOMMOPS (in fact, the need for an expanded JCOMMOPS). The **Committee agreed** that the OPSC process provided an adequate review of JCOMMOPS as requested by JCOMM-II.

Action:

(i) Publicize availability and encourage use of OSMC tool (OPA Coordinator and Secretariat; ongoing)

(ii) Completion of JCOMM-II requested review of JCOMMOPS (OCG, done)

3.1 2 Services Programme Area

3.1.2.1 The Committee noted with interest and appreciation the report of the Services Programme Area (SPA) Coordinator Dr Craig Donlon. Dr Donlon presented a summary of the report -Doc 3.1.(2) which provides a comprehensive assessment of the results and activities within the SPA since MAN-V. The presentation highlighted the contributions from the SPA teams, during the intersessional period since MAN-V (October 2006). The activities within the JCOMM SPA are progressing well and the SPACoordinator thanked all members

[1] http://osmc.noaa.gov:8180/Monitor/OSMC/OSMC.html

of the SPA teams and particularly the SPA Expert Teams (ETs) Chairs and Rapporteurs who have worked hard on many actions listed in the SPA workplan. The SPA Coordinator also thanked the joint Secretariat for their support in all aspects of the SPA.

3.1.2.1 It was noted that the Services Programme Area Coordination Group (SCG), as well as all the SPA teams had now all met and that a work plan (http://www.jcommservices.org/modules/documents/documents/JCOMM-SPA-WP-06-09-v1.6.pdf) has been developed and adopted by the SCG, providing a prioritization of activities agreed to by JCOMM-II and including the new SPA structure focused toward Met-Ocean support for Maritime Safety Systems as was proposed and endorsed at MAN-V.

3.1.2.3 The seven top-level-objectives (TLO) established for the SPA workplan were reviewed and all of the ETs report significant progress towards the SPA TLOs. Key results highlighted 1) the development and population of the Services web site, 2) agreement on areas of responsibility in the Arctic, 3) development and extension of the waves intercomparison project, 4) the JCOMM Storm Surge Symposium, 5) delivery of wave observation requirements to the OPA, development, and 5) implementation of IPY activities and transition of MPERSS to the JCOMM Services web site, among many others detailed in the report.

3.1.2.4 A dedicated JCOMM SPA web site (**http://www.jcomm-services.org)** and content management system has been set up by the UK Met Office to assist the development and management of the SPA. Content on the web site has been developed by most teams and positive feedback on the use of a 'shared wiki' approach to populating the site has been received. However, the Coordinator noted that more work was required to complete a basic set of web pages for all teams and that there is a need to consider merging JCOMM web sites in a common look and feel (noting the development of the jcomm.info web site). The Committee **agreed** that JCOMM should aim to integrate all web sites at the jcomm.info web site, either by branding or other solutions.

3.1.2.5 The potential JCOMM SPA involvement to the GlobWave project with the European Space Agency (ESA) was presented. It was noted that the ESA GlobWave activity has great potential to support the extension of the ETWS wave model intercomparison work into a spatial/spectral domain and include altimeter reference data as discussed at ETWS-II. Considerable discussion concerning the role and input of JCOMM has taken place over the last few months and the Committee was requested to provide guidance in this matter. The **Committee agreed** that this was a positive development and that the SPA should support ESA in this activity in a manner that allows the ETWS waves intercomparison extension project to evolve.

3.1.2.6 Dr Vasily Smolyanitsky, Chair of the Expert Team on Sea Ice (ETSI), briefed the Committee on the status of the IPY Ice Logistics Portal (http://www.ipy-ice-portal.com/). Supported financially for GMES with content under the purview of the ETSI, the portal has been in operation since May 2007. Recognizing the importance of a single website for global sea ice operational information, the **Committee decided** to approach a national agency already involved in operational sea ice services for continuing financial support after current funding runs out in June 2008. Dr Smolyanitsky also informed the Committee on plans for an "Ice Analysis Workshop" to be held in June 2008. The prime aim of the workshop would be the assessment of differences in current practices of ice analysis and charting at the national ice services, and accuracies for ice charts for both operational needs and climate analysis.

The **Committee endorsed** the Ice Analysis Workshop as part of the established SPA work plan.

3.1.2.7 The Committee was also informed on the status of other ongoing programmes and initiatives requiring attention and potential JCOMM involvement such as: (i) The European Global Monitoring for Environment and Security (GMES) Marine Core Service (MCS) / MyOcean project; and (ii) The Global High Resolution Sea Surface Temperature Pilot Project (GHRSST-PP). Noting the significant development of integrated (*in situ*, satellite, model and data management) operational ocean forecasting systems proposed by the European Union MyOcean project, Australian BLUELink and other systems, the **Committee recommended** that ETOOFS establish a collaboration with these organizations. The Committee also recognized the important developments made by the GHRSST-PP in developing a new generation of operational satellite SST data products and services and **endorsed** the proposal to strengthen the relationship between JCOMM and the GHRSST-PP project office and science team (e.g., satellite coordination activities, end-to-end technologies, operational standards and services, WIGOS/WIS).

3.1.2.8 Developments within the Global Ocean Data Assimiliation Experiment (GODAE) were discussed under agenda item 3.3, as was the endorsed proposal for an Expert Team for Operation al Ocean Forecasting Systems (ET-OOFS) .

3.1.2.9 Mention was made of the results of the Scientific and Technical Symposium on Storm Surges, organized by the WMO and IOC and hosted by the Korean government in Seoul, Republic of Korea, 2-6 October 2007. The Symposium provided a significant step forward in the facilitation and support of provision of safety-related services. The symposium was considered a great success; in particular the input to this Symposium would enhance storm surge forecasting capability, and complement the JCOMM Guide to Storm Surge Forecasting, under finalization. The Committee also noted that the 10th Workshop on Wave Hindcasting and Forecasting Workshop was held in association with the first Coastal Hazards Symposium (11-16 November in Oahu, Hawaii), which provided an opportunity to strengthen the wave and coastal hazard community, in recognition of the importance of total water level in coastal prediction for the wave community.

3.1.2.10 The Committee noted recommendations from both the Symposium on Storm Surges and the Wave / Coastal Hazard Workshops, that coastal forecast capabilities should be developed which address the issue of total water level and not just the individual components separately. In this context, it was **decided** to organize future Wave Workshop, Storm Surge Symposium, and Coastal Hazards events interlinked with each other.

3.1.2.11 Progress with the JCOMM Extreme Water Level Pilot Project (JEWL PP) has been limited and following discussion, the **Committee recommended** adjusting the formulation of the project to other initiatives in the frame of coastal area management and Disaster Risk Reduction (DRR).

3.1.2.12 The Committee noted the progress on the preparation of the JCOMM International Maritime Safety Conference (IMSC). Following detailed discussions with several groups, it was decided to change the venue to IMarEST, London in October 2008, in order to facilitate users' participation and to reduce travel costs. The scope of the conference has been revised to a more focused two-day. Sponsorship from IMarEST, MERSEA and NCOF has been secured for this event although a shortfall of some $80,000 USD is currently outstanding. Discussions

with the maritime industry suggest that further support should be available, especially working together with the proposed ET-OOFS. The Committee endorsed the revised plans and urged the SPA Coordinator and Secretariat to support the IMSC activities.

3.1.2.13 The SPA Coordinator provided an overview of issues that need to be addressed in terms of the SPA structure and the overall JCOMM structure drawing attention to the fact that both satellite and model outputs were not properly integrated within the current structural arrangements. In particular, several large international projects and systems were developing a fully integrated approach (i.e., including model requirements/outputs, satellite, *in situ*, data management) and JCOMM should work effectively with these projects in order to provide appropriate technical coordination. In particular, the need for a new integrating 'product line' approach to the JCOMM structure and better integration of satellite and ocean model products was **endorsed by the Committee**.

3.1.2.14 Dr Donlon informed the Committee of the planned workshop to be held jointly with WCRP and the Oil and Gas Producers (OGP), entitled "Storms in a changing climate and their impacts on offshore industry", at WMO Headquarters, Geneva, 27-29 May 2008. The **Committee endorsed** this initiative and encouraged strengthened collaboration with OGP.

Actions:

- **(i) JCOMM should aim to integrate all web sites at the jcomm.info web site, either by branding or other solutions (SCG, Secretariat; ongoing);**
- **(ii) Support GlobWave (SPA Coordinator, Secretariat; immediate);**
- **(iii) Approach operational sea ice agency for financial support of Ice Logistics Portal (Co-Presidents; immediate);**
- **(iv) Establish a collaboration between ETOOFS and national and regional integrated operational ocean forecasting systems with these organizations (ETOOFS Chair, SPA Coordinator, Secretariat; ongoing);**
- **(v) Interlink future Wave Workshop, Storm Surge Symposium, and Coastal Hazards events (SPA Coordinator, Secretariat; JCOMM-III);**
- **(vi) Re-formulate JEWL Pilot Project (SCG, Secretariat; JCOMM-III;**
- **(vii) Better integration of satellite and ocean model products and new integrating product line (SPA Coordinator, Secretariat; JCOMM-III)**
- **(viii) Strengthen collaboration with OGP (SPA Coordinator, Secretariat; ongoing).**

3.1 3 Data Management Programme Area

3.1.3.1 The Committee noted with interest and appreciation the summary of activities reported by the Data Management Programme Area (DMPA) Coordinator, Mr Keeley. He noted that JCOMM-II had requested the preparation of a data management plan and he was pleased to report that this was completed. He also presented the meeting with a first draft of an implementation plan for comment. The Data Management Coordination Group (DMCG) is in the process of consolidating BUFR templates for reporting data from OPA activities to standardize how information is reported. Cooperation with IODE has progressed very well. An upcoming meeting, the Standards Forum (21-25 January 2008, Ostende), is a jointly sponsored activity with the IOC International Oceanographic Data and Information Exchange (IODE). Its objective is to reach agreement on an initial, limited number of standards for the

ocean community and to put in place a process to continue the development and agreement of future standards. It is expected that some standards will be ready to propose to JCOMM-III.

3.1.3.2 The Meta-T project, designed to determine how to handle water temperature instrument metadata, has made some progress. A first objective is working towards agreement on what information needs to be exchanged with the observations and what can remain on servers that can be polled as required.

3.1.3.3 There has been a reorganization of activities in both expert teams. In the Expert Team on Marine Climatology (ETMC), the activities supporting the Marine Climatological Summaries Scheme (MCSS) have been handed to a task team to continue to manage. This will permit the ETMC to pay greater attention to other issues including climate summaries and indices (in cooperation with SPA) and an extreme waves database. The organization of the CLIMAR-III meeting is well in hand with the meeting scheduled for May 2008 in Poland. A project has also begun to recover information in historical logbooks, the (Recovery of Logbooks And International Marine data project (RECLAIM) project. In addition changes to Manuals and Guides as well as the International Maritime Meteorological tape (IMMT) will be presented to JCOMM-III. A change in ToR for ETMC to reflect the organizational changes will also be proposed.

3.1.3.4 The Expert Team on Data Management Practices (ETDMP) has concentrated its work exclusively on the development of the end-to-end (E2E) technology. This has become a component of the WIS where JCOMM is playing a very active role. The same technology has been adopted as the infrastructure for the IOC Ocean Data Portal. At a recent IODE Officers meeting it was agreed that ETDMP (a joint committee of DMPA and IODE) should pass the support and development of the E2E technology to a task team. This will allow ETDMP to take on the role of supporting the development and agreement to standards that will result from the January 2008 Standards Forum. A change in the Terms of Reference (ToR) for ETDMP to reflect this will be proposed to JCOMM-III.

3.1.3.5 The MAN then invited Mr Greg Reed to provide a short report on the outcome of the IODE Officers Meeting, held at the IOC Project Office for IODE between 27 and 30 November 2007. Mr Reed reported that the IODE Officers met to discuss the work plan for the next biennium 2008-2009. Some of the issues relating to JCOMM included:

- **Cooperation with WMO**: The IODE Officers expressed interest in the WIGOS project and invited WMO and JCOMM to consider IODE representation in the project Steering Team.

- **Cooperation with JCOMM**: The terms of reference for the JCOMM/IODE EPDMP were discussed and the IODE Officers recommended that the terms of reference be revised by JCOMM-III and IODE-XX. The IODE Officers had noted that the current terms of reference have been very focused on the development of the E2EDM system (which has now evolved into the Ocean Data Portal project) and the focus should be broadened to include such things as standards.

- **The IODE/JCOMM Standards Forum**: this event will be held from 21-25 January 2008 at the IODE Project Office, Ostend. It was noted that IODE had invited JCOMM to co-parent this event. Introductory information is available through the page: http://www.iode.org/standardsforum. The follow-up of this Forum will include

documenting and publishing the recommended standards as well as the continuing process of management and updating the standards. The officers recommended that this task be assigned to the ETDMP.

3.1.3.6 The Committee thanked Mr Keeley for his report and welcomed the progress of the DMPA, thanked Mr Greg Reed for his report on the outcome of the IODE Officers Meeting. The Committee expressed its appreciation for the close cooperation with, and support provided by, IODE.

3.1.3.7 The Committee stressed the importance of standards setting but noted that the standards recommended by the Forum will need to go through a process that enables consultation with focus communities as well as an intergovernmental process for their formal adoption by IOC Member States and WMO Members. The MAN noted that the focus of the January 2008 Forum is intentionally limited, as it is necessary to ensure a concrete outcome to validate the forum approach. Provided the forum can deliver on its objectives it is hoped that additional sessions of the forum can be organized in the future to address other areas where standards are urgently needed.

3.1.3.8 The Committee expressed its appreciation for the results-oriented work plan for the DMPA and urged the other PAs to develop similar work plans.

3.1.3.9 The **Committee adopted** the JCOMM Data Management Plan and requested the Secretariats to publish the document, after final editing, in the JCOMM Technical Report Series. The **Committee tasked** DMCG-III with finalization of the Implementation Plan for the JCOMM DM Plan.

3.1.3.10 Mr Sergey Belov then proceeded with a presentation on the Ocean Data Portal (http://www.oceandataportal.net) developed as a JCOMM/IODE ETDMP product, hosted by the IOC Project Office for IODE. Mr Belov explained that the "end to end" data management (E2EDM) technology is a set of comprehensive interconnected services for data discovery (using a metadata-driven approach), data access and delivery, as well as providing basic publishing services. The technology is extensible to application domains and coding systems, and provides high scalability. It can be used in various scales: (i) regional structures (e.g., IODE Regional Programmes, ODINs); (ii) operational structures (e.g., GOOS); (iii) modelling centres.

3.1.3.11 He then introduced the IODE Ocean Data Portal, adopted as a project by IODE-XIX. The Ocean Data Portal will provide transparent access to metadata and data held by all participating data centres (operating as data providers) taking into account all security and data policy issues. It aims to provide seamless and easy to use access to the different data, supplied by different programs. Using the E2EDM technology it can be used at the global, regional or task-specific scale.

3.1.3.12 The Ocean Data Portal user web-interface provides the ability to: (i) discover metadata (through simple Google-like or advanced search); (ii) retrieve data from the data providers (able to monitor the request progress in backgound); (iii) view data as a table, map or graph; and (iv) download received data in various standard formats. The **Committee urged** collaboration with the GEO webportal to ensure complementarity.

3.1.3.13 He concluded by summarizing the objectives of the E2EDM and Ocean Data Portal initiatives for 2008: (i) establish a network of not less than 10 data provider centres (involving Global Temperature-Salinity Profile Programme (GTSPP) and other progammes and projects); (ii) establish collaboration with other related projects and programmes (SeaDataNet, WIGOS); (iii) establish a web site dedicated to the Ocean Data Portal and integration technology including documentation and manuals on the service (e.g., how to use, how to become a data provider).

3.1.3.14 The Committee thanked Mr Belov for his presentation and welcomed the development of the Ocean Data Portal, noting that this was an excellent example of result-oriented cooperation between JCOMM and IODE. The Committee stress the importance that data centres as well as programmes that host an online data service participate in the project as data providers. The Committee also thanked the US National Oceanic and Atmospheric Administration and Government of Flanders for their support of the project and expressed the wish for them to continue their support.

Actions:

(i) Publish Data Management Plan in JCOMM Technical Report Series (Secretariat; immediate);
(ii) Finalize Data Management Implementation Plan (DMCG-III; 2008);
(iii) Collaboration with the GEO web portal to ensure complementarity (Secretariat; ongoing).

3.2 CROSS-CUTTING ACTIONS AND DELIVERABLES

International Polar Year and its Legacy

3.2.1 The Committee recalled that the International Council for Science (ICSU) and WMO together planned and launched the International Polar Year (IPY) 2007-2008, which was now being implemented with support from IOC and a number of other intergovernmental and non-governmental organizations and bodies. The IPY involved scientists from 63 nations and a broad range of disciplines, with the official IPY observing period to run from 1 March 2007 to 1 March 2009, in order to include a complete annual cycle of observations in both polar regions. In addition to its ongoing coordination of operational ocean and sea ice observing systems in both polar regions, JCOMM was already playing a substantial role in assisting the implementation of the IPY, through a variety of activities.

3.2.2 The Committee recognized that leaving behind a legacy was a key aim of the IPY 2007-2008, which would be focused on the establishment of observing systems for detecting and monitoring changes in the ice/ocean/atmosphere system at high latitudes and for providing the data essential for forecasting future change. In the preparations for the IPY, WMO, in partnership with ICSU and IOC, promoted the notion that Arctic and Southern Ocean Observing Systems should be key outcomes of the investment in the IPY 2007-2008. In the Arctic, the idea was to develop and sustain an integrated Arctic Ocean Observing System (iAOOS), while, in the Antarctic, a Southern Ocean Observing System (SOOS) was planned. Both iAOOS and SOOS would provide knowledge, understanding and prediction; knowledge of the state of the system at any one time; understanding of the processes at work; and the ability to combine that knowledge and understanding in advanced numerical models

to predict change. These two new systems would contribute directly to the Global Ocean Observing System (GOOS) and the Global Climate Observing System (GCOS). The development of ocean observing systems for the polar oceans is complementary to the establishment of a Global Cryosphere Watch (GCW), which was proposed to, and welcomed by, the Fifteenth World Meteorological Congress. In terms of resourcing an IPY legacy, the Committee noted with interest that Governments had urged the science community to take these developments forward, as expressed explicitly by the Arctic Council Ministerial Meeting (ACMM) of 26 October 2006, and the Antarctic Treaty Consultative Meeting (ATCM) on 11 May 2006.

3.2.3 The Committee was informed that the ICSU/WMO Joint Committee (JC) for the IPY had requested the IPY Project Office, the Secretariat and the JC Sub-Committees, to prepare a "road map" for the development of a detailed plan for the IPY legacy, for consideration by the next session of the JC in April 2008. In the case of the IPY ocean observing systems, the road map would focus on the process for the development of iAOOS and SOOS, as well as sea ice elements of the GCW, and would explicitly recognize the key role to be played by JCOMM in the future coordination and maintenance of a high latitude ocean/sea ice observing system. The **Committee agreed** that it was therefore critical that JCOMM, through the Secretariat, OPA and SPA/ETSI, should be directly involved in the implementation of the legacy road map and the development of the legacy implementation plan. It **recognized** that a successful implementation of the IPY legacy for ocean observations would involve at least three components:

(i) A mechanism for interaction and coordination between JCOMM and the IPY science community (through the PIs for the relevant IPY projects) to carry forward key components of the IPY ocean observing system;
(ii) A mechanism within JCOMM for integrating into the overall JCOMM observing system structure, coordination of and support for IPY ocean observing system elements, as they become operational;
(iii) Approaches to governments, through the ACMM and the ATCM, to develop the necessary governmental support for the long term maintenance of the observing systems. This latter should ideally be undertaken through GOOS and it's Intergovernmental Committee (I-GOOS).

3.2.4 The **Committee agreed** that JCOMM should be involved, initially, in the development and implementation of plans for the long-term maintenance of components of the observing system in which it already had expertise. It also **agreed** that it should at least develop communication with other observing system elements that were, at the present time, more experimental, with a view to their eventual integration into the operational system. It therefore **requested** the Co-Presidents, the Secretariat and the OCG and SCG, to carry forward this issue on behalf of the Commission. It also **requested** I-GOOS, through its chairman, to consider supporting the development and implementation of the IPY ocean observing system legacy, as specified in (iii) above.

Actions:

(i) Develop mechanisms for IPY legacy coordination and implementation (Co-Presidents and Secretariat, with OCG and SCG; 2008 and ongoing);

(ii) Request I-GOOS to support the implementation of IPY legacy through approaching ACMM and ATCM for resources (Co-Presidents, Secretariat and I-GOOS; 2008).

3.3 ESTABLISHMENT OF A NEW EXPERT TEAM ON OPERATIONAL OCEAN FORECAST SYSTEMS

3.3.1 Craig Donlon introduced this item, referring to document MAN-VI/3.3. MAN-V (October 2006, Geneva) and noting that SCG-III (November 2006, Exeter) had endorsed a restructuring of the Task Team for Ocean Product Development (TT-OPD), and that a Rapporteur for Operational Ocean Forecast Systems (OOFS) had been appointed to recommend a strategy for coordination of ocean model products, systems and input data requirements and their development for JCOMM.

3.3.2 The Global Ocean Data Assimilation Experiment (GODAE) has coordinated the development of ocean forecasting systems, and has made good progress. Its final symposium will be held in November 2008. Three key areas within the current GODAE workplan priorities include JCOMM: the development of product standardization and interoperability between systems (including intercomparison activities); the transition from demonstration to operational systems; and the sustainability of the global observing system, including especially satellite components.

3.3.3 Donlon recalled his recommendation that JCOMM-III consider an extensive restructuring of the SPA (see section 3.1(2)), but presented the Committee with an interim solution that an Expert Team on OOFS be established within the SPA. The proposed Terms of Reference for the team had undergone review by the Co-Chairs of GODAE and the Co-Presidents of JCOMM. He noted the overlap of the roles of ETOOFS and ETMAES, but suggested that a preparation to take on the legacy of GODAE was of immediate importance to JCOMM.

3.3.4 The SPA Coordinator and IOC have been consulting with the International GODAE Steering Team (IGST) on JCOMM SPA plans. The IGST supported the proposal for the establishment of an ET-OOFS, noting that a strong dialogue between SPA and GODAE groups should be maintained. The ongoing research and development effort required to maintain and advance operational ocean forecast systems would need to continue beyond GODAE, and this effort would need to maintain a close link to the ET-OOFS to ensure that work is complementary, and that science developments feed the operational systems.

3.3.5 Noting the rapid development of operational ocean forecasting systems and the need for information on and coordination of these systems, the **Co-Presidents decided**, with the endorsement of the Committee, to establish an Expert Team on Operational Ocean Forecast Systems in the Services Programme Area, with the Terms of Reference given in Annex III. The Committee encouraged the Rapporteur for Operational Ocean Forecasting Systems (OOFS) to take up the chairmanship of the ET-OOFS for this intersessional period, and **requests** the Secretariat to send a formal invitation to Dr Adrien Hines and plan for an early-2009 meeting in collaboration with industry. The long-term aim is to integrate JCOMM-related operational ocean forecasting systems (e.g., ETMAES and ETWS activities) within ETOOFS.

3.3.6 The **Committee asked** the Secretariat to also mobilize financial resources in support of the activities through national or private-sector support. The **Committee asked** the Expert Team to work as required with existing WMO, IOC, and other ocean forecasting groups, including GODAE (through the end of the Experiment in 2008), the World Climate Research Programme-Commission for Atmospheric Science (WCRP-CAS) Working Group on Numerical Experimentation (WGNE), other WCRP modeling groups, and developing IOC marine modeling coordination activities.

Actions:

(i) Finalize membership and Chair of ETOOFS (SPA Coordinator, Secretariat; immediate);
(ii) Plan for an early-2009 meeting in collaboration with industry and mobilize resources (Secretariat, Chair ETOOFS, SPA Coordinator; immediate);
(iii) ETOOFS to work as required with existing WMO, IOC and other ocean forecasting groups, including GODAE, the WCRP-CAS Working Group on Numerical Experimentation (WGNE), other WCRP modeling groups, and developing IOC marine modeling coordination activities (SPA Coordinator, ETOOFS Chair, Secretariat; immediate).

3.4 LOGISTICAL ARRANGEMENTS FOR JCOMM-III

3.4.1 The Committee was informed that the third session of the Commission (JCOMM-III) will take place in Morocco, between September 2009 and April 2010, with the optimal dates being between the end of October and mid-November 2009. Detailed planning for the session, in particular the preparation of documentation in the six-required languages, must begin at least one year before the session; the provisional agenda should be prepared before the end of 2008 in order to meet the statutory requirement for invitations 270 days in advance of the Commission session.

3.4.2 The **Committee urged** the Secretariat to urgently finalize the dates of the session with Morocco. The **Committee agreed** that the provisional agenda would be prepared via correspondence between the Secretariat and the Committee members before the end of 2008; the provisional annotated agenda could then be prepared for discussion during MAN-VII. The **Committee agreed** to consider candidates to receive the JCOMM Outstanding Service Certificates, themes for a possible scientific/technical workshop associated with the JCOMM-III, both for discussion during MAN-VII, and possible new leaders for JCOMM management positions. The Committee also endorsed the proposal by ETSI to award a WMO Certificate of recognition.

Actions:

(i) Set dates for JCOMM-III for late October – mid-November 2009 (Secretariat; immediate);
(ii) Draft provisional agenda (Secretariat and Co-Presidents; October 2008);
(iii) Draft provisional annotated agenda and document plan (Secretariat and Co-Presidents; MAN-VII);

(iv) Canvass all interested parties for candidates for JCOMM leadership positions, candidates to receive Outstanding Service Certificates and themes for a possible scientific/technical workshop associated with JCOMM-III (all; immediate);

(v) Develop plan for conduct of JCOMM-III to fit within available session budgetary resources (Co-Presidents and Secretariat; consideration by MAN-VII).

3.5 WMO STRATEGIC ISSUES

3.5.1 The Committee was informed that the Fifteenth WMO Congress established the Results-based Management (RBM) as the fundamental concept for managing the planning, implementation and performance assessment of WMO's programme activities. WMO's RBM concept consists of four major building blocks, namely, the WMO Strategic Plan (SP) /[2]/, the WMO Secretariat Operating Plan 2008-2011(SOP), the Results-based Budget 2008-2011(RBB) and the WMO Monitoring and Evaluation (M&E) Plan. It appreciated that among the five Strategic Thrusts the programme activities of JCOMM related to "Science and Technology Development and Implementation" and "Service Delivery" and contributed mainly to, among the 11 Expected Results (ER), to ER 1,2,4,5,6, and 7. The main focus of JCOMM was on ER 4 and 6. The Strategic Thrusts and the Expected Results are given in Annex IV.

3.5.2 The Committee noted that the SOP was a first step and that Cg had requested to expand the SOP into an organization-wide and comprehensive Operating Plan (WMO-OP) through adding the complementary contributions from the Technical Commissions, Regional Associations and the Steering Committees of the Programmes jointly sponsored by WMO and partner organizations.

3.5.3 The **Committee agreed** that JCOMM would take the following actions to facilitate generation of the required inputs during the 1st half of 2008:

- Review and align the current JCOMM work programme with the Expected Results mentioned above.
- Taking account of the Deliverables of the Marine Meteorology and Oceanography Programme of WMO formulate corresponding "outcome-focused" deliverables of JCOMM, and
- Define corresponding timelines and "SMART" /[3]/ Key Performance Targets (KPT);

3.5.4 As regards the WMO Monitoring and Evaluation (M&E) Plan, the Group was informed that the WMO Secretary-General is developing a draft proposal. It will be presented to the Meeting of the Presidents of Technical Commissions (PTC-2008, Geneva, February 2008), which should provide input specifically from the perspective of the TCs. The draft proposal will also be consulted with the RAs and the SCs by correspondence. The meeting of the EC Working Group on Strategic and Operational Planning (Geneva, February 2008) will

[2] WMO Strategic Plan (Geneva, May 2007), WMO-No. 1028, and http://www.wmo.int/pages/about/documents/WMO_1028_web_E.pdf
[3] Specific, measurable, achievable, reliable and time-bound

review the draft and recommend it to EC-LX (2008) for approval for immediate implementation, as appropriate.

3.5.5 That M&E draft plan will describe the inputs expected from all the TCs, which would be based on the KPTs each TC would attach to the Deliverables it had earlier contributed to the WMO-OP. JCOMM would be expected to develop that information, as requested by Cg and EC, taking into account the reporting milestones decided by Cg, i.e., EC-LXI (2009) and Cg-XVI (2011). Following the EC approval of the M&E Plan, JCOMM would be expected to set up arrangements for monitoring the implementation and achievement of its Deliverables in the 2nd half of 2008. The first contribution to the WMO Performance Evaluation Report would be expected from JCOMM for the mid-term M&E Report the EC requested for 2009.

3.5.6 Taking account of the programmatic decisions of EC-LXI (2009) based on the results of the mid-term performance review, the Secretariat will revise the SOP 2008-2011, incorporate the contributions of the TCs and RAs and publish the comprehensive WMO-OP for the period 2010-2011.

3.5.7 Res. 28 (Cg-XV) set the direction for development of the next WMO Strategic Plan. Cg-XV requested completion of the next draft WMO SP by the end of 2008 and the draft WMO-OP 2012-2015 by the end of 2009. It requested, *inter alia*, the technical commissions to lead the formulation of the scientific and technical aspects of WMO Programmes and activities including providing relevant analysis, assessment and indication of priorities and to improve necessary cross-linkages and coordination in developing the two plans and the Results-based Budget.

3.5.8 The Committee noted the following tentative roadmap towards developing the next WMO Strategic Plan, which has been drawn up as a result of the deadlines established by Cg-XV:

Dec 2007 – Dec 2008

- Deliverable 1: Input to EC-LX (2008) of draft outline of for the next WMO SP including TLO and ST for 2012-2015 [by 6/08]
- Deliverable 2: 1st Draft SP dispatched to Members [12/08]

→ Draft SP serves as input to WMO-OP (2012-2015) development

Dec 2008 – Dec 2009

- Deliverable 3: Input to EC-LXI (2009) of the Draft WMO-OP 2012-2015
- Deliverable 4: Revised draft WMO-OP (2012-2015) dispatched to Members [12/09]

→ Draft WMO-OP (2012-2015) serves as input to the RBB (2012-2015) development

Dec 2009 – Dec 2010

- Deliverable 5: Secretary-General's draft RBB proposal 2012-2015 submitted to EC-LXII (2010)

- Deliverable 6: Revised RBB proposal (2012-2015) dispatched to Members in preparation for Cg-XVI by [11/10]

3.5.9 The Committee noted the pivotal role of JCOMM-III in the 4th quarter of 2009 for providing strategic level input to the strategic planning process. The **Committee agreed** to organize the necessary actions within its working structure to review and finalize its draft contribution to the WMP-OP 2012-15, as developed by the Secretariat on the basis of the next WMO draft SP, at the JCOMM-III session.

Actions:

(i) Review and align the current JCOMM work programme as required by WMO (Co-Presidents, PA Coordinators and Secretariat; 1st half 2008);

(ii) Review and finalize its draft contribution to the WMO Operating Plan (Co-Presidents, PA Coordinators and Secretariat; 4th quarter 2009).

4. SCIENTIFIC AND TECHNICAL ISSUES

4.1 SCIENCE ISSUES AND OPPORTUNITIES

4.1.1 Dr Albert Fischer gave a presentation on behalf of Dr Ed Harrison, Chair of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC). The terms of reference of OOPC charge it with: the development of recommendations (including phased implementation) for a global system that provides data and information for climate monitoring and forecasting, assessment, and research; strategies for evaluation and evolution of the system; and support through liaison and advocacy. While the system is primarily for climate purposes, it also forms the basis for global operational oceanography.

4.1.2 Convincing policy makers that sustained ocean observations merit funding remains a necessary and important activity for JCOMM and others. Collecting climate quality observations and making them available to all is not sufficient. Efforts to summarize, present, and develop more awareness of the state of the ocean and its variability, and the importance of this variability for society, are crucial.

4.1.3 The development of this *ocean information* (assessments, understanding, forecasts, warnings, etc.) depends on a 'three-legged stool' of systems:

- Observing (with metadata, data management, data delivery)
- Analysis/Reanalysis/Forecast (to turn observations to information),
- Information Delivery,

and cannot be successful without all three. The ocean world is having to improve all three system legs at the same time.

4.1.4 Building the 'ocean services stool' has to begin with the observing system, which has its own three legs:

- quality *in situ* and satellite observations,
- appropriate data management,
- data transport, delivery and availability

This has been the focus of recent efforts by JCOMM, GOOS, GCOS and the WCRP. Information extraction has in many cases been left to others. Information delivery systems are in their infancy except for traditional marine meteorological services.

4.1.5 The OOPC has taken a small step towards the development of ocean climate information through its State of the Ocean[4] web site. Feedback to date is that it is still too specialist-oriented and that many users want more info about how the information here connects to impacts on weather. Another regular source of ocean climate information is the Bulletin of the American Meteorological Society (BAMS) annual state of the climate article. The ocean now gets very significant visibility in the summary of the previous year's climate, serving as a report (assessment) of recent ocean conditions, and the publication deserves more publicity.

4.1.6 With increased societal interest in trends over decadal and longer periods, uncertainty estimates need attention. There are legitimate questions about trend behavior in most of our historical data sets, including the reconstructions. The scientific and social implications are non-trivial. This highlights the key importance of agreements, coordination, and implementation of observation standards and metadata standards.

4.1.7 Ocean information collected in JCOMM and JCOMM-inherited programmes were crucial in a number of the statements of the widely-publicized IPCC Fourth Assessment Report issued this year. OOPC **charged** JCOMM to develop partnerships in taking on the extraction and delivery of ocean information.

4.1.8 All the hard-core JCOMM activities supporting the observing system leg of the Ocean Services 'stool' are critically important. Though visibility will always tend to go to those who get to deliver the end-user services, JCOMM should be proud of undertaking the work that ensures that quality services (especially ocean climate related services) can be delivered to society. JCOMM needs to maintain continuous effort at delivering and improving the core observing and data management and data delivery functions, and ensuring that any activities that are undertaken in support of the other legs of the stool do not weaken these core activities.

4.1.9 The **Committee recognized** that it should continue working with GOOS, WCRP, the WMO World Climate Programme (WCP) and Commission for Climatology (CCl), and other relevant groups in the development and provision of ocean climate information.

4.1.10 Co-president Dr Fellous gave a report on the development of a symposium to document and demonstrate the importance and benefits of the ocean observing system, also providing an occasion to revisit the current status and recommendations for the systems, bringing online new developments and capabilities. Provisionally titled "OceanObs'09 – ocean information for society: sustaining the benefits, realizing the potential" it is scheduled to be held 21-25 September 2009 in Venice, Italy and hosted by ESA and other organizations.

4.1.11 A provisional steering committee and informal commitments for organization of the meeting have been put in place. The symposium will celebrate the significant progress in the decade since the OceanObs'99 symposium, and will make a contribution to charting the way

[4] http://ioc.unesco.org/oopc/state_of_the_ocean/

forward for the coming decade. JCOMM involvement was assured in the scientific steering committee through Fellous and in the organizing committee through Fischer.

4.1.12 The **Committee welcomed** the development of the symposium and agreed to remain involved in the further development of the meeting.

Actions:

(i) Develop partnerships to improve extraction and delivery of ocean information (Co-Presidents, PA Coordinators and Secretariat; ongoing);
(ii) Continue working with GOOS, WCRP, WCP, CCl and other relevant groups in development and provision of ocean climate information (CO-Presidents, PA Coordinators and Secretariat; ongoing);
(iii) Assist in development of OceanObs '09 symposium (Co-Presidents, PA Coordinators and Secretariat; ongoing).

4.2 STANDARDS AND BEST PRACTICES GUIDE

4.2.1 The Committee recalled that, since its inception in 1907, the WMO Commission for Marine Meteorology, one of the predecessors of JCOMM, had responsibility for the global coordination, standardisation and eventually regulation of the provision of marine meteorological services. In support of such services, it also coordinated, and, to the extent possible, recommended best observing practices for the Voluntary Observing Ships. The results of this work were eventually consolidated in two WMO mandatory publications, the Manual on and Guide to Marine Meteorological Services, as well as in relevant sections and chapters of other WMO manuals and guides. The material included in these mandatory WMO publications was the subject of an extensive community development and formal intergovernmental review and approval process, and thus had the status of accepted standards and best practices.

4.2.2 Similarly, other bodies, which were now integral parts of JCOMM (GLOSS Group of Experts, Joint Committee for IGOSS and the DBCP) all recognized a requirement to develop and publish guidance on best practices in instrumentation, observations and data quality control for their respective specialized components of the ocean observing system. This guidance was generally published in the IOC Manuals and Guides series, and again could be recognized as community accepted practice. In addition, all these bodies from time to time coordinated or commissioned various other technical reports and surveys, for the benefit of Members/Member States, but which could not generally be regarded as recording accepted community standards. Exceptions to this included the peer-reviewed results of special projects such as the VSOP-NA (which had become the observing standards for the Voluntary Observing Ship (VOS) Climate Project, VOSClim), various sea ice standards (developed within the specialized sea ice community), and recommended best practices resulting from major international experiments such as the Tropical Ocean Global Atmosphere Experiment (TOGA) and the World Ocean Circulation Experiment (WOCE).

4.2.3 The first session of JCOMM had clearly recognized the importance of and role of JCOMM in evaluating and setting standards for instruments and observations to be included as part of an operational ocean observing system. It also recognized that this standard setting role should extend to data management practices, and the Management Committee was charged with taking appropriate action. The second session of JCOMM again took up the

issue, focusing on observation practices, and referring it to the Management Committee for action. In addition, JCOMM-II further recognized the role of JCOMM in developing standards and nomenclature for products and services, and both the Management Committee and Services Programme Area were requested to take follow-up action.

4.2.4 The Committee recognized that this was a complex issue, and also a critically important one for JCOMM. It agreed that the problem could be broken up into a number of components:

(i) Compilation of existing JCOMM standards and best practices material into a structured and easily accessible format/publication;
(ii) Implementation of a strategy for updating and maintaining existing material;
(iii) Implementation of a strategy for identifying and filling gaps.

4.2.5 The audience for this catalogue of standards and best practices material was internal, a tool for the Expert Teams and Implementation Panels as well as the Commission as a whole to keep stock of their material, as well as external. Three major external audience types were identified:

- New operators of observing platforms who would have their own reasons to take data but would want to make them available at JCOMM quality standards and through JCOMM data streams
- Creators and provisioners of products who would want to know about the quality of inputs to their products
- Deliverers of products who would like to know about the applicability and quality of JCOMM-related products

4.2.6 The proposed catalogue will segregate these types of users to present the material in a way appropriate to each. There should be an observing platform-segregated view as well as a products-segregated view. Each platform view (to include ocean satellites as well as *in situ* platforms) would hold information about standards and best practices of the entire system from:

- platforms, instrumentation, siting, characteristics; through
- data and metadata formats, quality control procedures, data stream implementation including real-time and archiving; and finally
- products using the platform data.

4.2.7 A product-segregated view would have information about the standards and best practices for data inputs, product output and metadata formats, intercomparison frameworks, quality control procedures, and the data streams from observing platforms (or other products) entering into the creation of the products. Such an approach provides a useful framework to explore the long-term structure of JCOMM.

4.2.8 The creation of the catalogue would help to identify gaps and information in need of updating. The tasks involved (and therefore the charge to the expert undertaking this work) were to:

1. extract the appropriate portions of the documents listed in Annex V and appropriately tag and identify them in the scheme outlined above,

2. give each extract a JCOMM identifier (number and branding)
3. implement a platform-segregated view as outlined above,
4. implement a product-segregated view as outlined above,
5. to do this in a system that was sustainable and simple to maintain, with those responsible for the maintenance clearly identified in the scheme.

4.2.8 The Committee understood that the compilation of the catalogue would not be a trivial task, and would probably require the services of a consultant, for a period approaching one month. It therefore **requested** the Secretariat, in consultation with the Co-Presidents, to approach relevant Members/Member States, with a view to their either seconding, or providing the resources to hire, an appropriate expert to undertake the work, which should be completed, and the catalogue published to the web, prior to JCOMM-III.

Actions:

(i) Approach Members/Member States for assistance to prepare catalogue (Co-Presidents and Secretariat; early 2008);

(ii) Preparation and publication of catalogue (Co-Presidents and Secretariat; JCOMM-III).

4.3 SATELLITE DATA REQUIREMENTS STRATEGY

4.3.1 The Committee noted with interest and appreciation the report on plans to develop a document responding to the tasking for the Task Team on Satellite Data Requirements by Dr Eric Lindstrom, Task Team Lead for Satellite Data Requirements. In conjunction with the OPA Coordinator, Mike Johnson, Dr Lindstrom proposed to deliver a document for JCOMM-III that discussed the integrated (space and *in situ*) observing strategy for a number of geophysical variables including sea surface temperature, sea surface height, ocean vector winds, chlorophyll-a, sea-ice, sea state, and sea surface salinity. The document is envisioned to be similar in scope and granularity to the IGOS Ocean Theme Report of January 2001, but different in perspective – having a much greater emphasis on operational utility and emphasis on the integrated nature of the space and *in situ* observing components. The document is tentatively entitled "Observing the Global Ocean for JCOMM - The Integrated Space-based and *in situ* Strategy." It was suggested that the concept of "system of systems" per GEOSS be worked into the title and Dr Lindstrom agreed to consider that. The **Committee welcomed and endorsed** the preparation of this document.

4.3.2 The Committee discussed the degree to which ocean colour and/or chlorophyll-a should be included. There is not yet an extensive *in situ* observing system component for ocean colour within the JCOMM structure but there is usage of those satellite products. The Committee concluded that chlorophyll-a (the only aspect of ocean colour for which there are operational algorithms) must be included as experimental JCOMM products.

Action:

(i) Draft document on the integrated (space and *in situ*) observing strategy for a number of geophysical variables including sea surface temperature, sea surface height, ocean vector winds, chlorophyll-a, sea-ice, sea state, and sea surface salinity (Task Team Lead for Satellite Data Requirements; JCOMM-III).

4.4 OBSERVATIONS PROGRAMME SUPPORT CENTRE

4.4.1 Co-president Dr Jean-Louis Fellous updated the Committee on the status of plans for the Observing Programme Support Centre (OPSC). As endorsed by MAN-V, the OCG drafted a list of requirements for an OPSC for consideration by the Co-Presidents. These requirements were then included in an "Announcement and Call for Letters of Intent (LoIs) to host an international OPSC" that was distributed to all IOC-WMO Members-Member States via a Joint Circular Letter. The planned OPSC would include the existing JCOMMOPS and in addition serve the growing requirements of the several international programmes working to coordinate implementation of an integrated global ocean observing system.

4.4.2 Fifteen LoIs have been received. The LoIs will be reviewed by a Committee established by the JCOMM Co-Presidents, which will include participation from the IOC and WMO Secretariats, and the programme implementation panels planning to contribute resources to the support of the OPSC. On the basis of this review the process for the further development of the OPSC will be continued by the Co-Presidents and the Secretariat.

Action:

(i) Complete OPSC review process (Co-Presidents and Secretariat; immediate).

4.5 WMO INTEGRATED GLOBAL OBSERVING SYSTEM

4.5.1 Dr Dieter Schiessl reported that the Fifteenth WMO Congress (Geneva, May 2007), when discussing the concept of integration between WMO Observing Systems, agreed that planning and implementation of the integration process should proceed in phases defined by the annual meetings of the Council in order to assure oversight, review and direction. The process foreseen is one where planning and implementation of an integrated WMO observing system and of the WMO Information System (WIS) would culminate with the sixteenth WMO Congress (2011) adopting improvements towards strengthening the WMO programme structure and the system of technical commissions, which would be positioned to extend the benefits of the integration into the service and application components of the overall WMO Programmes at both the national and international levels. Cg-XV also agreed that several Pilot Projects should be designed to test concepts, identify problem areas, and to help in elaborating the Plan. It had recommended that possible candidate Pilot Projects include:

(a) Integration of WWW/GOS and GAW;

(b) Initiation of a Global Hydrologic network addressing a GCOS requirement;

(c) Elaborating the underpinning/crosscutting role and responsibilities of the Instruments and Methods of Observation Programme;

(d) Integration of AMDAR into the WMO global observing systems;

(e) Integration of marine meteorological and other appropriate oceanic observations into the WMO global observing systems.

4.5.2 A draft proposal for a potential JCOMM pilot project will be discussed at the WMO EC Working Group on WIGOS. Such a pilot project would be designed to promote (i)

interoperability of marine data systems with the WMO Information System (WIS) in close cooperation with the IOC ocean community, and (ii) the documentation and integration of best practices and standards being used amongst the meteorological and oceanographic communities, and (iii) establish compliance with the WMO Quality Management Framework (QMF).

4.5.3 The **Committee charged** DMPA Coordinator Bob Keeley to present this draft proposal for discussion during the WMO EC Working Group on the WIGOS and WIS (4-7 December 2007, Geneva), and **requested** him to report back to the Co-Presidents with the results of the meeting. The current proposal represents an excellent example of the integration both across OPA and DMPA and with IODE that is an important aspect of JCOMM's mandate, and includes currently planned work being done to advance interoperability through the work of E2EDM and on standards. There may be opportunities for WIGOS to provide additional focus and support for this work, at which point a steering team would be established by the Co-Presidents with membership drawn from PA Coordinators, satellite rapporteur and from IODE. The steering team would define the precise objectives of the pilot project and should consider inclusion of other elements besides *in situ* data such as satellite data and model forecasting work.

Action:

(i) DMPA Coordinator to represent JCOMM at the first session of the WMO EC working group on WIGOS and WIS and report back to Co-Presidents and OPA and SPA Coordinators for decision of subsequent action (DMPA Coordinator; immediate).

5. JCOMM IMPLEMENTATION PLAN

5.1.1 The Committee thanked Dr D. James Baker for his excellent work in preparing the draft Implementation Plan. The group took note of the Draft Version 1.0 (dated 11 November 2007). The **Committee agreed** to accept and use this document, with minor revisions, as the JCOMM Operating Plan.

5.1.2 The Committee noted the need to prepare a shorter document in time for the forthcoming WMO EC-60, to serve as a monitoring tool to assess progress towards achieving specific JCOMM Programme Areas targets and deliverables, in a format reflecting the WMO and IOC Strategic objectives (see Annex VI). This document, tentatively entitled "Results-based JCOMM Management Plan", will contain 5-10 pages. The **Committee agreed** that this document will be prepared through an iterative process, starting from the Secretariats proposing a framework based on WMO 3 Top-Level Objectives, 5 Strategic Thrusts and 11 Expected Results and on IOC 4 Strategic Objectives and 4 Expected Results, and using inputs from the three Programme Area Coordinators in the form of their specific goals and objectives, with associated timelines and Secretariat costs, mapped onto this framework. These inputs will be used by Dr Baker to assemble the document by mid-April, 2008. The document will include elements of risk analysis.

5.1.3 Finally the group discussed the actual need for and purpose of a JCOMM Implementation Plan, which will serve as a strategic guide for the JCOMM community in the coming years in the pursuit of the long-term objectives. The **Committee agreed** that the Implementation Plan should not be formulated according to the current structure of the

Commission (i.e., with reference to the Observations, Services and Data Management Programme Areas), which is subject to revision. Rather, the Implementation Plan should be "service-oriented, product-based", and provide a strategic approach to delivering these products. Programme Area Coordinators will provide the building blocks, based on their existing respective implementation plans, which will be used by Dr Baker to prepare a condensed document (10-20 pages). The Implementation Plan will be drafted in advance of MAN-VII for further elaboration, and for adoption in final form at JCOMM-III.

Actions:

(i) Finalize the JCOMM Operating Plan (Dr DJ Baker, Secretariat; immediate);
(ii) Prepare and finalize a Results-based JCOMM Management Plan (Dr DJ Baker, Secretariat, PA Coordinators; April 2008);
(iii) Draft Implementation Plan (Dr DJ Baker, PA Coordinators, Secretariat, MAN-VII).

6. JCOMM REVIEW

6.1 The Committee recalled that the JCOMM Strategy, endorsed by JCOMM-II, included, *inter alia*, a requirement for a periodic review of the Commission:

"6.4 External Review

……..The parent bodies must ensure that JCOMM is periodically reviewed by an external group of experts every 8 years and the findings reported to every alternate Session, to ensure that JCOMM is best aligned to the requirements identified by its parent bodies and its clients."

The conduct of this review during the current intersessional period was specifically requested by JCOMM-II. The Management Committee, at its fifth session, gave implicit endorsement for the preparation and conduct of the review, to be presented at JCOMM-III.

6.2 The Committee agreed that the review, in conjunction with the Implentation Plan (IP), had to fulfill a number of purposes:

(i) Assess how well JCOMM is addressing high level strategic objectives and expected results as expressed in the various planning documents of both WMO and IOC since the establishment of the Commission;

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(ii) Assess how well JCOMM has fulfilled, over the past 8-10 years, the expectations of WMO and IOC for the Commission when it was established;

(iii) Analyse to what degree JCOMM delivers benefit to Members/Member States, and is cost-effective in its operations;

(iv) Based on the findings under (i) to (iii) above, provide recommendations on how JCOMM can improve benefits to its Members/Member States, as well as its cost-effectiveness - including modifications to its working structure, if appropriate.

In order to properly address these objectives, the review should be "external" (i.e. not directly by JCOMM officers, members, Secretariat, etc), but conducted by experts with some knowledge and experience of the history (and pre-history) of JCOMM, and of its present workings. It was the view of some Committee members that the review team should include, or be comprised of, experts who could assess technical progress made by JCOMM.

6.3 With these considerations in mind, the **Committee agreed** on the terms of reference for the review, which, together with a timeline for its conduct and reporting to the seventh session of the Management Committee, and eventually to JCOMM-III, and suggestions for composition of the review team, are given in Annex VII. The Committee further provided some additional guidelines for the conduct of the review, in the form of a series of questions related to the operation of JCOMM, including its external relations with both clients and other relevant bodies and organizations.

6.4 The **Committee agreed** that the review team should work primarily through email and occasional teleconferences. However, it recognized that the team would need to meet face-to-face at least once or twice during the review period, consult directly with a number of people in both Geneva and Paris, and also consult indirectly with Members/Member States, other organizations, and various client bodies, most probably by way of questionnaires.

6.5 On the basis of these considerations, and the draft review details given in Annex VII, the **Committee requested** the Secretariat to approach the Secretary-General of WMO and the Executive Secretary IOC, to obtain their formal approval and support for the conduct of the review, including the membership of the review team. It also requested the Secretariats to bring the review to the attention of the coming sessions of the Executive Councils of both parent Organizations, with a view to obtaining their endorsement.

Actions:

- **(i) Request the WMO Secretary General/IOC Executive Secretary (SG/ES) to facilitate the review within the means available, and work with SG/ES to investigate other possible review mechanisms made possible through the organizations (Co-Presidents; January 2008);**
- **(ii) Establishment of review team and activation of review (Co-Presidents and Secretariat; March 2008);**
- **(iii) Request both ECs approval to conduct review (Co-Presidents and Secretariat; June 2008);**
- **(iv) Conduct of review (review team and Secretariat; March-October 2008);**
- **(v) Review report to MAN-VII (Secretariat; February 2009).**

7. CAPACITY BUILDING STRATEGY

7.1 Ms Miriam Andrioli, Capacity Building Rapporteur, reported on capacity building activities undertaken since MAN-V, referring to Document JCOMM/MAN-VI/Doc 7(2).

7.2 Prof. Worth Nowlin then briefly reported on the outcome of the breakout group on the JCOMM Capacity Building Strategy. He informed the Management Committee that subsequent to MAN-V a discussion document had been prepared, collating the decisions of the various JCOMM management bodies related to Capacity Building. More recently a

revised Capacity Building Strategy had been prepared and discussed online between some of the members of the *ad hoc* Working Group established by MAN-V and lead by Mr Peter Pissierssens. This document (including WMO comments) had been the basis of the discussions held by the breakout group.

7.3 The conclusions of the breakout group were summarized as follows:

(i) The CB strategy as adopted by JCOMM in 2001 is too much a top-down approach. It was stressed that capacity building activities of JCOMM should respond first and foremost to national requirements, although they can be dealt with at the sub-regional or regional level as appropriate. It was noted that this constituted an amendment to Resolution 5 adopted by JCOMM-II;
(ii) Notwithstanding (i), activities supported under JCOMM will need to fit within the objectives of the three Programme Areas;
(iii) The group, after reviewing the revisions made to the JCOMM Capacity Building strategy as adopted in 2001, and taking into consideration the decisions made by JCOMM-II, decided it was required to totally overhaul the strategy bearing in mind (i) and (ii).

7.4 The group recommended the following way forward:

a) The strategy will be re-drafted by a working group composed of Miriam Andrioli, Worth Nowlin, Edgard Cabrera, Ehrlich Desa, Alice Soares and Peter Pissierssens;
b) The revision will be finalized by the end of March 2008, at which time the revised strategy document will be sent to the JCOMM Co-Presidents for their further action;
c) The adopted document can subsequently be submitted to the June 2008 Sessions of the WMO Council and IOC Executive Council.

7.5 Dr Donlon recalled that the SPA includes TLO-7 (top level objective) that deals with building capacity within JCOMM to make the most of international collaboration (e.g., GOOS and GEO/GEOSS), to share marine meteorological and oceanographic knowledge, infrastructure and services for the benefit of the Maritime community. Dr Donlon further recalled that the SPA had identified four stages of development for capacity building needs (ref. JCOMM Meeting Report No. 44, page 16).

7.6 The **Management Committee formally established** the working group that will redraft the JCOMM Capacity Building Strategy and approved its work plan as detailed in (a) to (c) above. The Committee further instructed the Co-Presidents to circulate the final draft for adoption by email, not later than 15 April 2008. The working group should take into consideration the ongoing work and arrangements of the SPA and other JCOMM Programme Areas.

Action:

(i) Working group to draft a capacity building strategy (composed of Miriam Andrioli, Worth Nowlin, Edgard Cabrera, Ehrlich Desa, Alice Soares and Peter Pissierssens; draft by March 2008).

8. JCOMM SUPPORT FOR COASTAL ISSUES

8.1 COASTAL GOOS ISSUES

8.1.1 Mr. François Gérard, Chair of I-GOOS, noted the importance of the JCOMM contribution not only to the open-ocean module of GOOS but also to the coastal module and to forecasting of marine hazards and the mitigation of their impacts. GLOSS already has been providing the necessary observing systems for marine hazards both in the coastal area and in the open ocean. He also informed the Committee about the Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG). Co-President Peter Dexter has been active in the *ad hoc* group leading up to its formation, and Regina Folorunsho has agreed to represent JCOMM on the recently established TOWS working group.

8.2 MARINE HAZARD IMPACTS IN THE COASTAL ZONE

8.2.1 The Committee also noted the establishment of a GOOS Scientific Steering Committee (GSSC) scientific advisory panel for Integrated Coastal Observations (PICO), formed to provide the with general scientific and technical advice concerning the implementation of the Coastal module of GOOS. The first meeting of this group will be 10-11 April 2008, back to back with the 11th Session of the GSSC in Paris.

9. EXTERNAL INTERACTIONS AND PARTNERSHIPS

9.1 GEO

9.1.1 The Committee received a presentation by Dr Jean-Louis Fellous, on the progress in building the Global Earth Observation System of Systems (GEOSS). On 30 November 2007, ministers and officials from a large number of the 72 countries and European Commission members of GEO, and many of the about 50 Participating Organizations met in Cape Town (South Africa) to review the status and advanced plan for building GEOSS.

9.1.2 The Cape Town meeting included a working Plenary (GEO-IV) on 28-29 November, which reviewed the progress in developing GEOSS, including 1) progress on and update of current GEO Work Plan, which extends until 2009; 2) GEO Report on Progress and annex on Early Achievements, for submission to the Ministerial Summit, and; 3) reports from the standing GEO Committees.

9.1.3 The Earth Observation Exhibition was held in parallel with the GEO Plenary meeting and Summit. The ocean community made collaborative efforts that led to very successful results: the Partnership for Observation of the Global Ocean (POGO), GOOS, Argo, Jason and other ocean programmes were introduced with various media material. JCOMM, together with GOOS and IODE, has distributed a new brochure during the event. The Committee congratulated the success of the exhibition.

9.1.4 Dr Fellous highlighted two important tasks in integrating and streamlining the existing observing activities in the GEO Framework, as follows:

i) A draft report on GEO Data Sharing Principles was reviewed during the GEO Plenary (for further adoption within two years), which would be a backbone of recommended guidelines for GEOSS data policies;

ii) A proposal to integrate the IGOS Partnership into GEO had been widely reviewed and accepted, in view of rationalizing similar efforts in the area of earth observation and building strategy. A paper for transitioning the Integrated Global Observing Strategy – Parnters (IGOS-P) Themes to appropriate areas/activities of the GEO was endorsed by the Plenary.

9.1.5 Dr Fellous emphasized the political nature of GEO and its "top-down" approach from policy-makers, which provides unprecedented visibility and political awareness to participating programmes and systems. As in the case of the IGOS-Partnership, the GEO process further enhances and rationalizes ongoing coordination, and provides opportunities to fill existing gaps in the Earth Observation systems and to secure continuity of existing activities with wider communities' participation.

9.1.6 Meanwhile, Dr Fellous cautioned against the heavy reporting and coordination duties associated with GEO, which sometime result in a lack of reporting, at the prejudice of real progress assessment in GEO Tasks.

9.1.7 In this context, the Committee felt that JCOMM should continue to focus on key activities highly relevant to the Commission's work plan, such as CL-06-05 ("Coordinate with the International Polar Year"), CL-06-06 ("Global Ocean Observing System: enhance and improve coordination of coastal and marine climate observations"), US-06-02 ("Pilot Community of Practice"). The Committee also noted the need to follow up a GEO 2-year target in the Societal Benefit Area of Climate, stating "support JCOMM to coordinate the implementation of and prepare regulatory and guidance information for an operational *in situ* ocean observing system".

9.1.8 The Committee also noted significant progress by the GEO Architecture and Data Committee (ADC) in 1) the guidance to document for data in various areas, including the Registry of Standards and Best Practices, 2) Data Sharing Principles, 3) GEONETCast, and 4) GEO Web Portal. The Committee encouraged that the DMPA in cooperation with IODE actively interact with the GEO/ADC to ensure that the relevant components of ocean observations and data managements be adequately considered in the GEO process.

9.1.9 In conclusion, Dr Fellous emphasized the need to fully understand that GEO Tasks simply reflect the activities of GEO Members, and that it is incumbent to the JCOMM community to step up for taking a lead role in their domain and to identify and fill in gaps in the GEO Work Plan, or in other words, to use the GEO framework as a vehicle to convey their successes and to highlight the impediments and bottlenecks in implementing the ocean component of GEOSS.

9.1.10 The Committee thanked Dr Fellous for his comprehensive report.

9.2 INDUSTRY

9.2.1 Professor Worth Nowlin reported on activities of the GOOS Advocacy and Outreach Group, chaired by Ralph Rayner of the Ocean.US Office and the Institute for Engineering, Science and Technology. Other members include: Colin K. Grant (BP), Jay Pearlman (Boeing), Ed Harrison (NOAA), Christina Lief (NOAA), D. James Baker, Mary Feeley (ExxonMobil), and Worth Nowlin (JCOMM/Texas A&M University). The group's outreach objective is to create awareness of the Global Ocean Observing System and the benefits it provides. Its advocacy objective is to create concerted advocacy for the full implementation and long-term support for a Global Ocean Observing System from a range of stakeholders and especially from multinational corporations. The group meets monthly, with involved individuals, via telephone discussions. Rayner prepares discussion agendas and meeting reports. This has proved a very effective method of operation.

9.2.2 The group seeks to engage stakeholders that represent a range of activities including: data providers, physical infrastructure providers, information/knowledge providers (intermediate users), and end users who make use of information/knowledge in support of operations, business planning and business strategy. The group is especially keen to engage end users as advocates and supporters. Plans have been made to include other users, including policy makers, charitable foundations, industry, NGOs, media, and professional bodies. To do this the group is developing general messages and display materials for use at various meeting venues. It is important that the messages be consistent. The main messages relate to:

- Weather
- Climate (Need improvement to weather forecasts and climate prediction. éWhy are ocean observations vital to climate change? Climate connection, prediction)
- Sustainability of the observing systems and impact of the absence of GOOS (sense of urgency. Time frame—satellites deteriorating—lack of availability to make predictions—sustainability of existing infrastructure. Keeping businesses vital and running. Reducing and managing risk).

9.2.3 The next major workshop of the advocacy group will be in conjunction with GSSC-XI (7-10 April 2008, Paris) where a separate meeting of industry leaders will be held to explore collaborative benefits of an operational observing system. One goal of such a meeting is to explore how principal groups engaged in designing, building and operating global systems which integrate satellite and *in situ* data with models can benefit though sharing their collective experience. Other goals are to inform industry leaders regarding JCOMM activities and to encourage their advocacy for such activities. Materials for use in various media and venues are being developed. The Institute of Marine Engineering, Science and Technology will launch its new Journal of Operational Oceanography just prior to this meeting (March 2008).

9.2.4 The group also is seeking to include an Ocean layer in Google to which tentative agreement has been given. Initially this will be in the form of a daily SST as a pilot with more layers to be added. A pilot page and associated GOOS web page have been designed and are under test.

9.2.5 The Committee thanked Professor Nowlin and Dr Donlon for maintaining strong JCOMM links to this advocacy. The **Committee recommended** strengthening links with

POGO, and to build on their success with the media. The Committee thanked the *ad hoc* task team on industry (that had met in March 2006, Paris) for providing the foundation for the work of the advocacy group, and **approved** that the ad hoc team was now merged into the advocacy group.

Actions:

(i) Strengthen links with POGO (Secretariat to approach Ralph Rayner; immediate);
(ii) Send letter of appreciation to *ad hoc* Task Team on Industry (Secretariat and Prof Nowlin, immediate).

10. OTHER BUSINESS

10.1 The Co-Presidents and Secretariat will review the implementation of the intersessional workplan and associated budget requirements immediately following MAN-VI.

11. CLOSURE OF THE SESSION

11.1 DATE AND PLACE OF MAN-VII

11.1 Co-President Dr Peter Dexter offered to host the next session of the Management Committee in Australia in either early December 2008 or early February 2009. Professor Nowlin noted that this venue would be very appropriate as a ten-year follow-on to the first planning workshop for the formation of JCOMM that took place in Australia in 1998. The Committee suggested considering holding a one half day session of scientific/technical presentations of JCOMM-related activities (such as ocean forecasting and industrial services).

Action:

(i) Plan for MAN-VII (Co-Presidents and Secretariat; immediate).

11.2 ADOPTION OF THE REPORT

11.2.1 The Committee reviewed and approved the final report of the meeting and action items (Annex VIII) for the intersessional period.

11.3 CLOSURE OF THE MEETING

11.3 The sixth session of the JCOMM Management Committee closed at noon on Thursday, 6 December 2007.

Annex I

AGENDA

1. Opening of the session

2. Reports

3. Preparations for JCOMM-III

- 3.1 PAs plan of action and deliverables
- 3.2 Cross-cutting actions and deliverables
- 3.3 Establishment of a new Expert Team on Ocean Forecast Systems
- 3.4 Logistical arrangements for JCOMM-III
- 3.5 WMO strategic issues

4. Scientific and technical issues

- 4.1 Science issues and opportunities
- 4.2 Standards and best practices guide
- 4.3 Satellite data requirements strategy
- 4.4 Observations Programme Support Centre
- 4.5 WMO Integrated Global Observing System

5. JCOMM Implementation Plan

6. JCOMM review

7. Capacity Building Strategy

8. JCOMM support for coastal issues

- 8.1 Coastal GOOS issues
- 8.2 Marine hazard impacts in the coastal zone

9. External interactions and partnerships

- 9.1 GEO
- 9.2 Industry

10. Other business

11. Closure of the session

- 11.1 Date and place of MAN-VII
- 11.2 Adoption of the report and action list
- 11.3 Closure of the meeting

Annex II

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Annex III

TERMS OF REFERENCE FOR THE EXPERT TEAM ON OPERATIONAL OCEAN FORECAST SYSTEM (ETOOFS)

The Expert Team on Operational Ocean Forecast Systems shall:

a. Develop and maintain a 'Guide to Operational Oceanographic Forecasting Systems "
b. Develop, for other JCOMM teams and Members/Member States, guidance on the nomenclature, symbology and related standards to be used by operational ocean forecasting systems, as well as the applications of the output from these systems;
c. Develop and operate an intercomparison framework for near-real-time monitoring of OOFS outputs, building on the legacy of GODAE;
d. Coordinate closely with the scientific community developing and maintaining OOFS (e.g., GODAE and GODAE follow-on) on the further development and operational implementation of the systems;
e. Provide recommendations on observational data requirements for OOFS to the JCOMM Observations Programme Area (OPA);
f. Maintain liaison with the JCOMM Data Management Programme Area (DMPA) on data management issues related to OOFS;
g. Provide advice to Members/Member States on operational ocean forecast systems.

General Membership

The core membership is selected to include the chair and up to five core members, ensuring an appropriate range of expertise in ocean forecast systems, data assimilation using ocean models, satellite and *in situ* data requirements for ocean models, and operational model intercomparisons. Additional experts may be invited as appropriate to represent ocean forecasting systems/groups, with the concurrence of the Co-Presidents of the Commission and with no resource implications to the Secretariat.

Annex IV

**STRATEGIC THRUSTS AND EXPECTED RESULTS
AS CONTAINED IN THE WMO STRATEGIC PLAN
(GENEVA, MAY 2007)**

Strategic Thrusts	**Expected Results**
Science and Technology Development and Implementation	1. Enhanced capabilities of Members to produce better weather forecasts and warnings
	2. Enhanced capabilities of Members to provide better climate predictions and assessments.
	3. Enhanced capabilities of Members to provide better hydrological forecasts and assessments
	4. Integration of WMO observing systems
	5. Development and implementation of the new WMO Information System
Service Delivery	6. Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness
	7. Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services:
Partnership	8. Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations:
Capacity Building	9. Enhanced capabilities of NMHSs in developing countries, particularly Least Developed Countries, to fulfil their mandates:
Efficient Management and Good Governance	10. Effective and efficient functioning of constituent bodies
	11. Effective and efficient management performance and oversight of the Organization:

Annex V

JCOMM GUIDES, MANUALS AND PUBLICATIONS FOR STANDARDS AND BEST PRACTICES CATALOGUE

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
JCOMM Services Programme Area											
WMO No. 49	Technical Regulations			UTD	WMO, SG	WMO	En Fr Ru Sp Ar Ch	WMO Technical Regulations	Y	Y	Y
WMO No. 558	Manual on marine meteorological services (Volume I-Global aspects, Volume II-Regional aspects) http://www.jcomm.info Summary: This Manual is designed to: (a) facilitate cooperation in respect of the international coordination of marine meteorological services; (b) specify obligations of Members in the implementation of marine meteorological services; (c) ensure uniformity in the practices and procedures employed in archiving (a) and (b) above; and facilitate the development of adequate support from WWW to marine meteorological services. The Manual is composed of Volumes I and II, dealing with technical regulations for global and regional aspects respectively.	2006	Y	UTD	Chair, SCG	JCOMM via SCG	En Fr Ru Sp	Marine services	Y	Y	Y
WMO No. 471	Guide to marine meteorological services, 3rd edition http://www.jcomm.info Summary: This Guide provides a complement to the Manual (WMO-No. 558), which contains standard and recommended practices to be applied by Members in the provision of Marine Meteorological Services (such as broadcast of weather and sea bulletins, warnings, marine information for Search and Rescue operations, pollution of the sea, etc.)	2006	Y	UTD	Chair, SCG	JCOMM via SCG	En Fr Ru Sp	Marine services	Y	Y	Y

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
WMO No. 9, Volume D	Information for shipping Summary: This publication contains information on (i) Meteorological Broadcast Schedules for shipping and other Marine Activities (Meteorological Broadcasts by Radiotelegraphy and Radiotelephony, Meteorological Broadcasts by Radio-Facsimile, Global Maritime Distress and Safety System (GMDSS)), (ii) Coastal Radio Stations Accepting Ships' Weather Reports and Oceanographic Reports (List of Coastal Radio Stations, List of INMARSAT Coast Earth Stations (CESs)), (iii) Specialized Meteorological Services (Marine Meteorological Services Available for Main Ports, Ship Weather Routeing Services), and (iv) Visual Storm Warning Signals. Full information is given on the issue of meteorological forecasts and warnings to shipping and on the collection of ships' weather reports	2006	Y	TBU	Chair, SCG	SCG	En	Ship shipping	Y	Y	Y
WMO No. 259	WMO sea-ice nomenclature Summary: Describes WMO Sea-ice terminology, and the international system of sea-ice symbols. It also provides for an illustrated glossary.	2006	Y	UTD	Chair, ET-SI	ET-SI	En Fr Ru Sp	Sea-ice nomenclature	Y	N	N
WMO No. 240	Compendium of Training Facilities for Meteorology and Operational Hydrology	1996	N	TBU			En Fr Ru Sp		N	Y	N
WMO No. 574	Sea-ice information services in the world http://www.jcomm.info Summary: This publication consists of two parts: Part I: A general description of the nature of sea ice, of methods of observation and of the basis of ice information services; Part II: Regional sea ice information services.	2006	N	UTD	Chair, ET-SI	ET-SI	En	Sea-ice services	N	N	N

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
WMO No. 702	Guide to wave analysis and forecasting, second edition http://www.jcomm.info Summary: This Guide provides guidelines on wave forecast methodology suitable for use by NMHSs in the provision of ocean wave forecast and hindcast services in support of the requirements of users in the whole range of maritime activities (shipping, fisheries, offshore mining, commerce, coastal engineering, construction, recreation, etc.).	1998	Y	UTD	Chair, ET-WS	JCOMM via ET-WS	En Fr Ru Sp	Wave analysis forecasting	Y	Y	Y
WMO TD No. 779	Storm surges / Vladimir E. Ryabin, Oleg I. Zilberstein, and W. Seifert Summary: This publication provides information and describes techniques of forecasting storm surges		N		Chair, ET-WS	ET-WS	En	Storm surge		N	N
WMO TD No .70	Forecast techniques for ice accretion on different types of marine structures, including ships, platforms and coastal facilities / by Ralph G. Jessup (Atmospheric Environment Service, Canada). Summary: This publication provides information and describes techniques of prediction ice accretion on different type of marine structures	1985	N	TBU	Chair ET-SI	ET-SI	En	Forecast sea-ice ship platforms coastal	Y	N	N
WMO TD No. 840	Tropical coastal winds / prepared by W.L. Chang.	1997	N	TBU	Chair, ET-MSS	ET-MSS	En	Tropical Coastal wind		N	N
WMO TD No. 850	Handbook of offshore forecasting services / prepared by Offshore Weather Panel.	1998	?	TBU	Chair, SCG	SCG	En	Forecast offshore services		N	N
WMO TD No. 858	Evaluation of the highest wave in a storm / prepared by A.V. Boukhanovsky, L.J. Lopatoukhin and V.E. Ryabinin. Summary: This publication provides information and describes techniques of evaluation and calculation the highest wave in a storm.	1997	N	TBU	Chair, ET-WS	ET-WS	En	Extreme Waves storm		N	N
WMO TD No. 959	MARPOLSER 98 : Metocean Services for Marine Pollution Emergency Response	1998	N	UTD	Chair, ET-	ET-MAES	En	Marine pollution		N	N

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
(vol I) WMO TD No. 960 (vol II)	Operations, Townsville, Australia, 13-17 July 1998 : proceedings http://www.jcomm.info Summary: These publications provide information on the nature and types of marine pollution emergencies, the clean-up and other operations; define the types and scope of meteorological data and services which are required to support these operations; and provide guidance and technical support NMHSs to develop their support activities to the highest level.				MAES			services			
JCOMM TD No. 9 WMO TD No. 1041	Estimation of extreme wind wave heights / by L.J. Lopatoukhin et al. Summary: This publication provides not simple estimates of extreme wind wave heights, but informative and authoritative support in their decision-making http://www.jcomm.info	2000	N	TBU	Chair, ET-WS	ET-WS	En	Extreme wind wave		N	N
JCOMM TD No. 23 WMO TD No. 1214 b	SIGRID-3 : A vector archive format for sea ice charts / developed by the International Ice Charting Working Group's Ad Hoc Format Team for the WMO Global Digital Sea Ice Data Bank Project. http://www.jcomm.info	2004	Y	UTD	Chair, ET-SI	ET-SI	En	Sea-ice SIGRID charts	Y	N	N
JCOMM TD No. 24 WMO TD No. 1215 b	Ice Chart Colour Code Standard http://www.jcomm.info	2004	Y	UTD	Chair, ET-SI	ET-SI	En	Sea-ice	Y	N	N
JCOMM TD No. 30 WMO TD No. 1333	Verification of operational global and regional wave forecasting systems against measurements from moored buoys / by J. -R. Bidlot and M.W. Holt.	2006	N	UTD	Chair, ET-WS	ET-WS	En	Wave forecast moored buoy	N	N	N
IOC Manuals and Guides No. 13	Manual for Monitoring Oil and Dissolved/Dispersed Petroleum Hydrocarbons in Marine Waters and on Beaches.	1984	Y (if updated)		Chair, MAES	JCOMM via MAES	En	Oil marine monitoring coastal	Y	N	

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
IOC Manuals and Guides No. 24	Guide to Satellite Remote Sensing of the Marine Environment.	1992	N	TBU	SPA satellite rapporteur	JCOMM via cross cutting team on satellite data requirements	En	Satellite remote sensing observation marine	Y	Y	
IOC Manuals and Guides No. 36	Methodological Guide to Integrated Coastal Zone Management.	1997	Y	TBU	Chair, SCG	SCG	En	Marine coastal services	Y	N	
IOC Manuals and Guides No. 41	Potentially Harmful Marine Microalgae of the Western Indian Ocean	2001	N	TBU	Chair, ET-MAES	ET-MAES	En	Harmful microalgae Indian ocean	N	N	
IOC Manuals and Guides No. 33	Manual on Harmful Marine Microalgae.	1995	Y (if updated)	TBU		JCOMM via ET-MAES	En	Marine harmful microalgae	Y	N	
JCOMM Observations Programme Area											
WMO No. 8	Guide to Meteorological Instruments and Methods of Observation	2006	Y (part)	TBU	President, CIMO	CIMO. JCOMM to propose changes to CIMO for relevant parts	En Fr Ru Sp	CIMO instrument method observation best practice	Y	Y	Y
WMO No. 544	Manual on the Global Observing System	2005	Y (part)	TBU	President, CBS	CBS. JCOMM to propose changes to CBS for relevant parts	En Fr Ru Sp	Observing System GOS	Y	N	Y
WMO No. 488	Guide on the Global Observing System	2005	Y (part)	TBU	President, CBS	CBS. JCOMM to propose changes to CBS for relevant parts	En Fr Ru Sp	Observing System GOS	Y	N	Y

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
WMO No. 47	International list of selected, supplementary and auxiliary ships http://www.wmo.ch/web/www/ois/pub47/pub47-home.htm Summary: This edition contains information and instrumental metadata about the ships participating in the WMO Voluntary Observing Ships Scheme. This information has been supplied by the countries which have recruited ships within the framework of this programme, in accordance with regulation 2.3.3.3 and 2.3.3.4 as contained in WMO Publication No. 544 - *Manual on the Global Observing System*, Volume I, Part III	2005	Y	UTD	WMO (Chief, OCA)	SOT	En Fr	Ship metadata	Y	Y	Y
WMO No. 806	An overview of selected techniques for analysing surface-water data networks Summary: This report brings together a review of a number of techniques currently employed in evaluating and designing stream gauging networks and illustrates their use with examples	1994	N				En	Sea surface	Y	N	N
JCOMM TD No. 4 WMO TD No. 1009	The Voluntary Observing Ships Scheme – A Framework Document http://www.jcomm.info Summary: In view of the importance of VOS observations, and at the same time of the ongoing and increasing difficulties in VOS recruitment and maintenance, the JCOMM (formerly CMM) Subgroup on the VOS recognized the value of adopting a guiding strategy or framework document for the VOS. This document would provide VOS operators with a global framework in which to develop and maintain their national VOS programmes, and at the same time help to sensitize user groups and organizations to the VOS scheme in general, its structure, operations and value.	2000	Y	TBU	Chair, VOSP	SOT	En	SOT VOS VOSP ship observation	Y	N	N

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
MMROA Report No. 25	Ships Observing Marine Climate - A Catalogue of the Voluntary Observing Ships Participating in the VSOP-NA	1991	Y	UTD	Chair, VOSClim	SOT TT on VOSClim	En	SOT VOSClim ship observation climate	N	N	N
MMROA Report No 26	The Accuracy of Ship's Meteorological Observations - Results of the VSOP-NA	1991	Y	UTD	Chair, VOSClim	SOT TT on VOSClim	En	SOT VOSClim ship observation climate	Y	N	N
JCOMM TD No. 5 WMO TD No. 1010	Voluntary Observing Ships (VOS) Climate Subset Project (VOSCLIM) – Project Document, Revision 2	2002	Y	TBU	Chair, VOSClim Task Team	SOT TT on VOSClim	En	SOT VOSClim ship observation climate	N	N	N
JCOMM TD No. 8 WMO TD No. 1032	Oceanographic and Marine Meteorological Observations in the Polar Regions - A Report to JCOMM http://www.jcomm.info	2000	N	TBU	Chair, OCG	OCG	En	Sea-ice polar observation		N	N
JCOMM TD No. 31 IOC Manuals and Guides No. 14 WMO TD. No. 1399	Manual on Sea Level Measurement and Interpretation, Volumes I – IV http://www.jcomm.info Summary: This Manual provides information on tide gauge technology and measurement techniques, including information on real-time reporting capability and a capacity to provide data of use to a tsunami warning system.	2006	Y	UTD	Chair, GLOSS-GE	JCOMM via GLOSS	En	Sea-level tide gauge observation Tsunami	Y	N	N
IOC Manuals and Guides No. 4	Guide to Oceanographic and Marine Meteorological Instruments and Observing Practices	1975	Y (if updated)	Obs./TBU	Chair, OCG	JCOMM via OCG	En	Observation instrument practices	Y	Y	
IOC Manuals and Guides No. 15	Operational Procedures for Sampling the Sea-Surface Microlayer	1985	Y (if updated)	Obs.	OPA satellite rapporteur	JCOMM cross cutting team on satellite data requirements	En	Sea-surface observation microalgae	Y	N	

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
IOC Manuals and Guides No. 2	International Catalogue of Ocean Data Station	1976	N	Obs.	Director, GOOS PO	GOOS	En	Observation metadata	N	N	
IOC Manuals and Guides No. 12	Chemical Methods for Use in Marine Environment Monitoring.	1983	Y (if updated)		Director, GOOS PO	GOOS	En	Chemical marine monitoring	Y	N	
IOC Manuals and Guides No. 6 rev	Wave Reporting Procedures for Tide Observers in the Tsunami Warning System	1968	N	Obs,/TBU			En	Waves Tsunami observation warning	Y	N	
IOC Manuals and Guides No. 20	Guide to Drifting Buoys	1988	Y (if updated)	Obs./TBU	TC DBCP	JCOMM via DBCP	En	Drifting buoy	Y	Y	
IOC Manuals and Guides No. 29	Protocols for the Joint Global Ocean Flux Study (JGOFS) Core Measurements	1994	Y (if updated)			JGOFS	En	Marine JGOFS flux	Y	N	
IOC Manuals and Guides No. 32	Oceanographic Survey Techniques and Living Resources Assessment Methods	1996	Y (if updated)		Chair OCG	OCG	En	Living resources survey	Y	N	
JCOMM Data Management Programme Area											
WMO No. 781	Guide to the applications of marine climatology Summary: This Guide provides a set of procedures for the collection, exchange, quality control, archival and processing of marine climatological data. (dynamic part of the guide available in electronic form via the Volume 25, Issue 7 of	1994 & 2005	Y	TBU by CLIM AR-III	Chair, ET-MC	JCOMM via ET-MC	En Fr Ru Sp	Marine climatology IMMT IMMA MQCS MCSS GCC	Y	Y	Y

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
	the International Journal of Climatology, Special Issue: Advances in Marine Climatology) http://www3.interscience.wiley.com/cgi-bin/jissue/110507133?CRETRY=1&SRETRY=0										
WMO No. 306	Manual on Codes	2006	Y (part)	UTD	President, CBS	CBS JCOMM to propose changes to CBS for relevant parts	En Fr Ru Sp	GTS codes format	Y	N	Y
WMO No. 386	Manual on the Global Telecommunication System		Y (part)	UTD	President, CBS	CBS JCOMM to propose changes to CBS for relevant parts	En Fr Ru Sp	GTS	Y	N	Y
JCOMM TD No. 13 WMO TD No. 1081 b	Advances in the Applications of Marine Climatology - The Dynamic Part of the WMO Guide to the Applications of Marine Climatology (CD-Rom) http://www.jcomm.info	2003	Y	UTD	Chair, ET-MC	ET-MC	En	Marine climatology	N	N	N
IOC Manuals and Guides No. 1	Guide to IGOSS (now JCOMM) Data Archives and Exchange (BATHY and TESAC)	1993	Y (if updated)	TBU	Chair, DMCG	JCOMM & IODE via DMCG	En	Data management	Y	Y	
IOC Manual & Guides No. 3	Guide to operational Procedures for the Collection and Exchange of IGOSS (now JCOMM) Data, Third Revised Edition http://www.jcommops.org/soopip/mg3.html	1999	Y (if updated)	TBU Standards forum planned with IODE	Chair, DMCG	JCOMM via DMCG	En	Data management	Y	Y	

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
IOC Manuals and Guides No. 9 rev	Manual on International Oceanographic Data Exchange. (Fifth Edition), including Guide for Responsible National Oceanographic Data Centres as Annex II	1991	Y (if updated)	TBU (with No. 19)	Chair, DMCG	IODE & JCOMM via DMCG	En	Data management RNODC	Y	N	
IOC Manuals and Guides No. 16	Marine Environmental Data Information Referral Catalogue. Third Edition.	1993	N	TBU according to SeaDataNet dev.	Chair, IODE	IODE	En	Marine information		N	
IOC Manuals and Guides No. 17	GF3: A General Formatting System for Geo-referenced Data, Volumes I – VI	1993	N	Obs.	Chair, IODE	IODE	En	Geographical GIS	Y	N	
IOC Manuals and Guides No. 18	User Guide for the Exchange of Measured Wave Data	1987	N	TBU	Chair, DMCG	DMCG and ETWS	En	Waves data management	Y	N	
IOC Manuals and Guides No. 19	Guide to Specialized Oceanographic Centres (SOC)	1988	N	TBU	Chair, IODE	IODE & JCOMM via DMCG	En	SOC	Y	Y	
IOC Manuals and Guides No. 22	GTSPP Real time Quality Control Manual http://woce.nodc.noaa.gov/woce_v3/wocedata_1/woce-uot/document/qcmans/mg22/guide22.htm	2002	Y	UTD (electronic) TBU (paper version)	Chair, GTSPP	GTSPP	En	GTSPP water temperature profile quality control QC	Y	Y	
IOC Manuals and Guides No. 26	Manual of Quality Control Procedures for Validation of Oceanographic Data.	1993	Y (if updated)	TBU Standards forum planned with IODE	Chair, DMCG	IODE & JCOMM via DMCG	En	Quality control QC ocean data	Y	N	

No.	Title	Year	Hand book	Status	Contact	Responsible group	Languages	Keywords	Standard	JCOMM MOU	Mandatory
IOC Manuals and Guides No. 34	Environmental Design and Analysis in Marine Environmental Sampling.	1996	Y (if updated)		Chair, DMCG	IODE & JCOMM via DMCG	En	Observation analysis environment sampling	Y	N	

Annex VI

WMO AND IOC STRATEGIC OBJECTIVES

WMO Top-Level Objectives:

1. To produce more accurate, timely and reliable forecasts and warnings of weather, climate, water, and related environmental elements

2. To improve the delivery of weather, climate, water, and related environmental information and services to the public, governments and other users

3. To provide scientific and technical expertise and advice in support of policy and decision-making and implementation of the agreed international development goals and multilateral agreements

IOC Top-Level Objectives (from IOC Medium-Term Strategy):

1. To prevent and reduce the impacts of natural hazards

2. To help society mitigate and adapt to climate change and variability

3. To safeguard the health of oceans ecosystems

4. To establish the management procedures and policies leading to the sustainability of coastal and ocean environment and resources

Merged Objectives:

Warnings, mitigation, and adaptation: to prevent and reduce the impacts of natural hazards, and to help society mitigate and adapt to climate change and variability, and to safeguard the health of oceans ecosystems, it is necessary to produce more accurate, timely and reliable forecasts and warnings of weather, climate, water, and related environmental elements, and to improve the delivery of weather, climate, water, and related environmental information and services to the public, governments and other users

Management and policy: To establish the management procedures and policies leading to the sustainability of coastal and ocean environment and resources, it is necessary to provide scientific and technical expertise and advice in support of policy and decision-making and implementation of the agreed

international development goals and multilateral agreements and to use this expertise

JCOMM will contribute to the WMO Strategic Thrusts:

1. Science and Technology Development and Implementation
2. Service Delivery
3. Partnership
4. Capacity-building
5. Efficient Management and Good Governance

In the context of these WMO and IOC Expected Results:

WMO: Expected Results

1. Science and Technology Development and Implementation:

1a. Enhanced capabilities of Members to produce better weather forecasts and warnings

1b. Enhanced capabilities of Members to provide better climate predictions and assessments

1c. Enhanced capabilities of Members to provide better hydrological forecasts and assessments

1d. Integration of WMO observing systems

1e. Development and implementation of the new WMO Information System

2. Service Delivery

2a. Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness

2b. Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services

3. Partnership

3a. Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations

4. Capacity-building

4.a. Enhanced capabilities of Members in developing countries, particularly least developed countries, to fulfil their mandates

5. Efficient Management and Good Governance

5.a. Effective and efficient functioning of constituent bodies

5.b. Effective and efficient management performance and oversight of the Organization

IOC Expected Results:

1. To prevent and reduce the impacts of natural hazards

1a. Promote integrated and sustained monitoring and warning systems for coastal and oceanic natural hazards, in close coordination with other relevant intergovernmental organizations where appropriate, using enhanced coastal and ocean networks, including education and training activities.

1b. Educate communities at risk with respect to natural hazards impact prevention, preparedness and mitigation measures.

2. To help society mitigate and adapt to climate change and variability

2a. Increase the understanding of the ocean's role in climate variability and climate change.

2b. Contribute to the better prediction of climate through ocean observations and process studies, at regional and global scales.

2c. Increase the understanding of the impacts of climate change and variability on marine ecosystems and their living resources.

3. To safeguard the health of oceans ecosystems

3a. Actively contribute to the regular process for global reporting and assessment of the state of the marine environment.

3b. Further develop the research and monitoring required for the prevention of marine environment degradation, and the maintenance of biodiversity and the sustainable use of marine habitats.

3c. Identify and develop the capacity building necessary for maintenance of healthy oceans ecosystems focusing on the regional needs.

4. To establish the management procedures and policies leading to the sustainability of coastal and ocean environment and resources

4a. Enhance regional cooperation and involvement of the Member States through capacity building and transfer of technology.

4b. Facilitate science related to ocean and coastal resource management.

4c. Enhance development and implementation of decision support tools that improve integrated ocean and coastal management

Annex VII

JCOMM Review 2008

Draft Terms of Reference

1. Assess how well JCOMM is addressing the strategic objectives of the WMO 6LTP and the IOC Medium Term Strategy (2008 - 2009) and relevant Strategic Thrusts and Expected Results of the WMO Strategic Plan (approved 2007) and the IOC Medium Term Strategy 2008-2011 (approved 2007)

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2. Assess how well JCOMM has fulfilled, over the past 8-10 years, the expectations of WMO and IOC for the Commission as expressed in the final reports of Cg-13 (1999) and the 20th session of the IOC Assembly (1999).

3. Analyse to what degree JCOMM is beneficial to Members/Member States, and is cost-effective in its operations.

4. Based on the findings under 1 to 3, make recommendations on how JCOMM can improve benefits to its Members/Member States, and its cost-effectiveness - including modifications to its working structure, if appropriate.

Background and guidance

List of reference documents
List of key people, groups, organizations, clients, Members/Member States to be consulted
Suggested set of questions which might be addressed by the review team, given in the Appendix
Keep review team small with independent members
Encourage broad consultation (e.g., data community (ODINs), ocean forecasting community sea ice, waves, directors of major forecasting/modeling Centre s)
Organize a stratified review with a single reviewer for the final synthesis
Questionnaire for Members/Member States, external groups, organizations, clients, prepared by the Secretariat in consultation with the review team

Tentative timeline

December 2007	MAN-VI agree on approach, scope, ToRs, composition, timeline
January 2008	Formal proposal for review submitted to Secretary-General and Executive Secretary for approval and implementation
March 2008	Task Review Team, review begins
June 2008	Report on the review by Co-Presidents and Secretariat to the Executive Councils of WMO and IOC
Late 2008	Review complete; draft report prepared; begin version 2 of Strategic Plan
January 2009	Strategic Plan V2
February 2009	MAN-VII to consider both draft review report and Strategic Plan V2, and provide comment and proposals for JCOMM-III

Appendix

The Review could proceed on the basis of a series of questions related to the operation of JCOMM, for example similar questions to those posed during the reviews of IODE and GOOS:

Question 1. Given that the Joint WMO-IOC Commission for Oceanography and Marine Meteorology (JCOMM) was established in 1999 with the following Terms of Reference:

The Technical Commission shall be responsible for matters relating to:

Further development of the observing networks

Under the guidance of the relevant scientific and operational programmes of IOC and WMO, development, maintenance, co-ordination and guidance of the operation of the global marine meteorological and oceanographic observing systems and supporting communications facilities of these organizations to meet the needs of the IOC and WMO Programmes and in particular of the Global Ocean Observing System (GOOS), the Global Climate Observing System (GCOS) and the World Weather Watch (WWW). Evaluation on a continuing basis of the efficiency of the overall observing system and suggesting and co-ordinating changes designed to improve it.

Implementation of data management systems

Development and implementation, in co-operation with the Commission for Basic Systems (CBS), the Committee for International Oceanographic Data and Information Exchange (IODE), the International Council of Scientific Unions (ICSU), and other appropriate data management bodies, end to end data management systems to meet the real-time operational needs of the present operational systems and the global observing systems; co-operation with these bodies in seeking commitments for operation of the necessary national compilation, quality control, and analysis centres to implement data flows necessary for users at time scales appropriate to their needs.

Delivery of products and services

Provision of guidance, assistance and encouragement for the national and international analysis centres, in co-operation with other appropriate bodies, to prepare and deliver the data products and services needed by the international science and operational programmes, Members of WMO, and Member States of IOC. Monitoring of the use of observations and derived products and suggesting changes to improve their quality. Co-ordination of the safety-related marine meteorological and associated oceanographic services as an integral part of the Global Maritime Distress and Safety System of the International Convention for the Safety of Life at Sea (SOLAS).

Provision of capacity building to Member States

Review and analysis of the needs of Member States of IOC and Members of WMO for education and training, and for technology transfer and implementation support in the areas of responsibility of the technical commission. Provision of the necessary technical publications, guidance material, and expert lecturers/trainers and operation of workshops as required to meet the needs. Development of projects to enhance Member States capacity to

participate in and benefit from marine meteorological and oceanographic programmes of WMO and IOC.

Assistance in the documentation and management of the data in international systems

Development of co-operative arrangements with the data management bodies of IOC, ICSU, and WMO, such as IODE, the Commission for Climatology (CCl), and the ICSU World Data Centres to provide for comprehensive data sets (comprising both real-time and delayed mode data) with a high level of quality control, long term documentation and archival of the data, as required to meet the needs of secondary users of the data for future long term studies.

These responsibilities exclude those aspects specifically handled by other WMO constituent bodies or equivalent bodies of IOC.

(a) Are the structure and objectives still appropriate?

(b) Are there different arrangements that would be more effective?

(c) Are the linkages to other WMO and IOC Programs and relevant Programs of other Intergovernmental and Non-Governmental bodies effective and appropriate?

Question 2. The structure of the JCOMM includes a Management Committee and three programme areas (Observations, Data Management and Services), their subsidiary expert and task teams, and two crosscutting activities for capacity building and satellite data requirements *[include chart]*

(a) Is this structure efficient and effective for fulfilling the mission and objectives of JCOMM? If not, propose an alternative structure.

(b) Are the Terms of Reference of subsidiary bodies, Groups of Experts and Committees appropriate and effective?

(c) Are the procedures for the establishment, review and reporting of these bodies and groups effective and appropriate? What improvements should be considered?

Question 3. Referring to the clients and users of JCOMM observations, products and services:

(a) Is JCOMM adequately addressing the needs of its key clients and users?

(b) Are there gaps in the observations, products and services of JCOMM that should be addressed, and are there other users and/or clients whose requirements are pertinent to the operation of the JCOMM?

(c) Are the mechanisms for feedback, evaluation and consultation from the users of JCOMM observations, data and services adequate and appropriate?

Question 4. Oversight and management.

(a) Are the methods for JCOMM review and assessment of Programs and activities effective and appropriate?

(b) Are the structures, procedures and methods of JCOMM adequately described and documented?

(c) Are the management and oversight arrangements of JCOMM effective and appropriate?

(d) Are capacity enhancement activities adequately addressing Member State needs?

(e) Does the JCOMM have an appropriate and effective Programme for outreach and communication of its activities?

Question 5. The Secretariat

(a) Are the present arrangements for providing Secretariat support to the JCOMM and its various groups, panels and teams efficient and effective?

(b) Is the past and current work Programme of the Secretariat adequately addressing the needs of JCOMM and Members/Member States?

Annex VIII

LIST OF ACTIONS FOR THE MANAGEMENT COMMITTEE
(decisions from MAN-VI)

Paragraph reference from MAN-VI report	Action	Who	When
3.1 (1) Observations Programme Area			
3.1 (1) 5	Publicize availability and encourage use of OSMC tool	OPA Coordinator, Secretariat	ongoing
3.1 (1) 7	Review of JCOMMOPS	OCG	done
3.1 (2) Services Programme Area			
3.1(2) 4	Integrate all web sites at jcomm.info	SCG, Secretariat	immediate
3.1(2) 5	Support GlobWave	SPA Coordinator, Secretariat	immediate
3.1(2) 6	Approach operational sea icea agency for financial support of Ice Logistics Portal	Co-Presidents	immediate
3.1(2) 7	Establish collaboration between ETOOFS and national and regional integrated operational ocean forecasting systems	ETOOFS Chair, SPA Coordinator, Secretariat	ongoing
3.1(2) 10	Interlink future Wave Workshop, Storm Surge Symposium and Coastal Hazards events	SPA Coordinator, Secretariat	JCOMM-III
3.1(2) 11	Reformulate JEWL Pilot Project	SCG, Secretariat	JCOMM-III
3.1(2) 13	Better integration of satellite and ocean model products and new integrating product line	SPA Coordinator, Secretariat	JCOMM-III
3.1(2) 14	Strengthen collaboration with OGP	SPA Coordinator, Secretariat	ongoing
3.1 (3) Data Management Programme Area			
3.1 (3) 9	Publish Data Management Plan in JCOMM Technical Report Series	Secretariat	immediate
3.1 (3) 9	Finalize Data Management Implementation Plan	DMCG-III	2008
3.1 (3) 12	Collaborate with GEO webportal to ensure complementarity	Secretariat	ongoing

3.2 Cross-cutting actions and deliverables			
3.2.4	Develop mechanisms for IPY legacy coordination and implementation	Co-Presidents and Secretariat with OCG and SCG	ongoing
3.2.4	Request I-GOOS to support the implementation of IPY legacy through approaching ACMM and ATCM for resources	Co-Presidents, Secretariat and I-GOOS	2008
3.3 Establishment of a new Expert Team on Operational Ocean Forecast Systems			
3.3.5	Finalize membership and chair of ETOOFS	SPA Coordinator, Secretariat	immediate
3.3.5	Plan an early-2009 meeting in collaboration with industry; mobilize resources	Secretariat, ETOOFS Chair, SPA Coordinator	immediate
3.3.6	ETOOFS to work as required with existing WMO, IOC, and other ocean forecasting groups, including GODAE, WCRP-CAS Working Group on Numerical Experimentation (WGNE), other WCRP modeling groups, and developing IOC marine modeling coordination activities	SPA Coordinator, ETOOFS Chair, Secretariat	immediate
3.4 Logistical arrangements for JCOMM-III			
3.4.2	Set dates for JCOMM-III	Secretariat	immediate
3.4.2	Draft provisional agenda	Secretariat and Co-Presidents	October 2008
3.4.2	Draft provisional annotated agenda and document plan	Secretariat and Co-Presidents	MAN-VII
3.4.2	Canvass all interested parties for candidates for JCOMM leadership positions, candidates to receive Outstanding Service Certificates and themes for possible scientific/technical workshop associated with JCOMM-III	All	immediate
3.4.2	Develop plan for conduct of JCOMM-III to fit within available session budgetary resources	Secretariat and Co-Presidents	MAN-VII
3.5 WMO Strategic Issues			
3.5.3	Review and align current JCOMM work programme as required by WMO	Co-Presidents, PA Coordinators and Secretariat	1st half 2008
3.5.3	Review and finalize draft contribution to WMO Operating Plan	Co-Presidents, PA Coordinators and Secretariat	4th quarter 2009

4.1 Science issues and opportunities			
4.1.7	Develop partnerships to improve extraction and delivery of ocean information	Co-Presidents, PA Coordinators and Secretariat	ongoing
4.1.9	Continue work with GOOS, WCRP, WCP, CCL and other relevant groups in development and provision of ocean climate information	Co-Presidents, PA Coordinators and Secretariat	ongoing
4.1.12	Assist in development of OceanObs '09 symposium	Co-Presidents, PA Coordinators and Secretariat	ongoing
4.2 Standards and best practices guide			
4.2.8	Approach Members/Member States for assistance to prepare catalogue	Co-Presidents and Secretariat	Early 2008
4.2.8	Prepare and publish catalogue	Co-Presidents and Secretariat	JCOMM-III
4.3 Satellite data requirements strategy			
4.3.1	Draft document on integrated observing (space and *in situ*) strategy for a number of geophysical variables	Task Team Lead for Satellite Data Requirements	JCOMM-III
4.4 Observations Programme Support Centre (OPSC)			
4.4.2	Complete OPSC review process	Co-Presidents and Secretariat	immediate
4.5 WMO Integrated Global Observing System (WIGOS)			
4.5.3	DMPA Coordinator to represent JCOMM at first session of the WMO EC working group on WIGOS and WIS	DMPA Coordinator	immediate
5.1 JCOMM Implementation Plan			
5.1.1	Finalize JCOMM Operating Plan	Dr DJ Baker, Secretariat	immediate
5.1.2	Prepare and finalize a Results-based JCOMM Management Plan	Dr DJ Baker, Secretariat, PA Coordinators	April 2008
5.1.3	Draft Implementation Plan	Dr DJ Baker, PA Coordinators, Secretariat	MAN-VII
6. JCOMM review			
6.5	Request SG and ES to facilitate the review within means available, and work with EC and ES to investigate other possible review mechanisms made possible through the organizations	Co-Presidents	January 2008
6.5	Establishment of review team and activation of review	Co-Presidents, Secretariat	March 2008

6.5	Request both ECs approval to conduct review	Co-Presidents, Secretariat	June 2008
6.5	Conduct review	Review team, Secretariat	March-October 2008
6.5	Review report to MAN-VII	Secretariat	February 2009
7. Capacity Building Strategy			
7.6	Working group to draft a capacity building strategy	Miriam Andrioli, Worth Nowlin, Edgard Cabrera, Ehrlich Desa, Alice Soares and Peter Pissierssens	March 2008
9.2 Industry			
9.2.5	Strengthen links with POGO	Secretariat, Dr Ralph Rayner	immediate
9.2.5	Merge *ad hoc* task team on industry with GOOS Advocacy and Outreach Group	Secretariat, Prof Nowlin	immediate
11.1 Data and place of MAN-VII			
11.1	Plan for MAN-VII	Co-Presidents and Secretariat	immediate

Annex IX

ACRONYMS AND OTHER ABBREVIATIONS

ACMM	Arctic Council Ministerial Meeting
ADC	GEO Architecture and Data Committee
AMDAR	Aircraft Meteorological Data Reporting
Argo	Array for Real-time Geostrophic Oceanography programme
ASAP	Automated Shipboard Aerological Programme
ATCM	Antarctic Treaty Consultative Meeting
BUFR	Binary Universal Form for Representation of meteorological data
CAS	Commission for Atmospheric Sciences
CB	Capacity Building
CBCG	Capacity Building Coordination Group (JCOMM)
CBS	Commission for Basic Systems (WMO)
CCl	Commission for Climatology
CEOS	Committee on Earth Observation Satellites
CG	WMO Congress
CHY	Commission for Hydrology
CIS	Canadian Ice Service
CLIMAR	International Workshop on Advances in Marine Climatology
CLIVAR	Climate Variability and Predictability (WCRP)
COMSAR	IMO Sub-Committee on Radio Communications and Search and Rescue
CSA	Canadian Space Agency
DART	Deep-ocean Assessment and Reporting of Tsunamis
DBCP	Data Buoy Cooperation Panel (OPA)
DCPC	WIS Data Collection Product Centre
DDR	Disaster Risk Reduction
DM	Data Management
DMCG	Data Management Coordination Group (JCOMM)
DMPA	Data Management Programme Area (JCOMM)
DPM	Disaster Prevention and Mitigation
DRR	Disaster Risk Reduction
E2EDM	End-to-End Data Management
EC	European Commission
EC	Executive Council
ECDIS	Electronic Chart Display Information System
ECV	Essential Climate Variables
EMSA	European Maritime Safety Agency
ENVISAT	Environmental Satellite
ER	Expected Results
ERS	European Remote Sensing
ESA	European Space Agency
ET	Expert Team
ET2.2	CCI Expert Team on Climate Monitoring including use of Satellite and Marine Data and Products
ET-EGOS	CBS Expert Team on the Evolution of the GOS
ETDMP	Expert Team on Data Management Practices (DMPA)
ETMAES	Expert Team on Marine Accident Emergency Support (SPA)
ETMC	Expert Team on Marine Climatology (DMPA)
ETMSS	Expert Team on Maritime Safety Services (SPA)
ETOOFS	Expert Team on Operational Ocean Forecast System (OOFS)
ETRP	WMO Education and Training Department
ETSI	Expert Team on Sea Ice (SPA)
ETWS	Expert Team on Wind Waves and Storm Surges (SPA)

EWS	Early Warning System
GAW	Global Atmosphere Watch
GCOS	Global Climate Observing System
GCW	Global Cryosphere Watch
GDPFS	Global Data Processing and Forecasting System (CBS)
GDSIDB	Global Digital Sea Ice Data Bank
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
GHRSST	GODAE High Resolution SST
GLOSS	Global Sea-level Observing System
GMDSS	Global Maritime Distress and Safety System (IMO)
GMES	Global Monitoring for Environment and Security
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GOS	Global Observing System (WWW)
GOSUD	Global Ocean Surface Underway Data
GRA	GOOS Regional Alliance
GSC	GOOS Steering Committee
GSSC	GOOS Scientific Steering Committee
GTS	Global Telecommunication System (WWW)
GTSPP	Global Temperature-Salinity Pilot Project
HAB	Harmful Algal Bloom
I-GOOS	Intergovernmental Committee for GOOS
IABP	International Arctic Buoy Programme
iAOOS	integrated Arctic Ocean Observing System
ICG	Inter-Commission Coordination Group
ICG/ITSU	International Coordination Group for ITSU (IOC)
ICOADS	International Comprehensive Ocean-Atmosphere Data Sets
ICS	International Chamber of Shipping
IGOS-P	Integrated Global Observing Stratergy Partners
IHO	International Hydrographic Organization
IICWG	International Ice Charting Working Group
IMMT	International Maritime Meteorological Tape
IMO	International Maritime Organization
IMSO	International Mobile Satellite Organization
INMARSAT	International Mobile Satellite Organization
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCCP	International Ocean Carbon Coordination Project
IODE	International Oceanographic Data and Information Exchange (IOC)
IOTWS	Indian Ocean Tsunami Warning and Mitigation System
IP	Implementation Plan
IPAB	International Programme for Antarctic Buoys
IPY	International Polar Year
ITG	Inter-commission Task Group
ITSU	International Coordination Group for the Tsunami Warning System in the Pacific
JAMBOREE	IODE/GOOS/JCOMM Combined Modelling and Data Management Training Workshop
JASON	Altimeter Satellite (TOPEX follow-on)
JC	Joint Committee
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM *in situ* Observing Platform Support Centre
JEWL PP	JCOMM Extreme Water Level Pilot Project
KPI	Key Performance Indicator

KPT	Key Performance Target
LDC	Least Developed Country
MAN	Management Committee (JCOMM)
MARCDAT	International Workshop on Advances in the Use of Historical Marine Climate Data
MCS	Marine Core Service
MCSS	Marine Climatological Summaries Scheme
MEDI	Marine Environmental Data Information Referral Service
META-T	Water Temperature Metadata Pilot Project
MMOP	Marine Meteorology and Oceanography Programme (WMO)
MOC	Atlantic Meridional Overturning Circulation
MPERSS	Marine Pollution Emergency Response Support System (JCOMM)
MSI	Maritime Safety Information
MSS	Maritime Safety Services
NCOF	National Centre for Ocean Forecasting
NGO	Non-governmental Organization
NMHS	National Meteorological (and Hydrological) Service (WMO)
NOAA	National Oceanic and Atmospheric Administration (US)
NWP	Numerical Weather Prediction
OceanSITES	Ocean Sustained Interdisciplinary Timeseries Environment observation System
OCG	Observations Coordination Group (JCOMM)
ODAS	Ocean Data Acquisition Systems, Aids and Devices
ODIN	Oceanographic Data and Information Network (IODE)
OOFS	Operational Ocean Forecast System
OOPC	Ocean Observations Panel for Climate
OPA	Observations Programme Area (JCOMM)
OPAG	Open Programme Area Group
OPS	Observing Programme Support
OPSC	Observing Programme Support Centre
OSMC	Observing System Monitoring Centre
OSTM	Ocean Surface Topography Mission
PA	Programme Area (JCOMM)
PIRATA	Pilot Research Moored Array in the Tropical Atlantic
PMO	Port Meteorological Officer
POGO	Partnership for Observation of the Global Oceans
PP	Pilot project
PTC	Meeting of the Presidents of Technical Commissions
PWS	Public Weather Service
QARTOD	Quality Assurance of Real-Time Oceanographic Data
QC	Quality Control
RA	Radar Altimeter
RBM	Results-based Management
RECLAIM	Recovery of Logbooks and International Marine data project
RRR	Rolling Review of Requirements
SAR	Synthetic Aperture Radar
SCAR	Scientific Committee on Antarctic Research
SCDPM	Sub-Committee on Data Policy and Management
SCEOS	Sub-Committee on Education, Outreach and Communication
SCG	Services Coordination Group (JCOMM)
SCOBS	Sub-Committee on Observations
SIGRID	Format for the archival and exchange of sea-ice data in digital form
SG	Steering Group
SMOS	ESA's Soil Moisture and Ocean Salinity
SOG	Statement of Guidance

SOOS	Southern Ocean Observing System
SOT	Ship Observations Team (OPA)
SOLAS	International Convention for the Safety of Life at Sea
SOOP	Ship Of Opportunity Programme
SOOPIP	JCOMM Ship-of-Opportunity Programme Implementation Panel
SPA	Services Programme Area (JCOMM)
SST	Sea Surface Temperature
TC	Tropical Cyclone
TECO-WIS	Technical Conference on WIS
TIP	Tropical Moored Buoys Implementation Panel
TLO	Top Level Objectives
TOPEX	Ocean Topography Experiment
TOR	Terms of Reference
TT	Task Team
TT-OPD	Task Team on Ocean Products Development (SPA)
TTR	Task Team on Resources
TWS	Tsunami Warning System
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
URD	User Requirement Document (SPA)
VOS	Voluntary Observing Ship
VOSClim	Voluntary Observing Ships Climate Subset Project
WCP	World Climate Programme
WCRP	World Climate Research Programme (WMO/IOC/ICSU)
WDC	World Data Centre
WIGOS	WMO Integrated Global Ocean Observing System
WIS	WMO Information System
WGNE	Working Group on Numerical Experimentation
WMO	World Meteorological Organization (UN)
WWW	World Weather Watch (WMO)
XBT	Expendable Bathy-Thermograph