JCOMM MANAGEMENT COMMITTEE
NINTH SESSION

Geneva, Switzerland, 13-16 September 2011

FINAL REPORT

JCOMM Meeting Report No. 88

WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

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NOTES

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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. Opening

1.1.1. The ninth session of the Management Committee of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was opened by the Commission Co-President, Dr Peter Dexter, at 0930 hrs on Tuesday, 13 September 2011, in the Conference Room 8J of the World Meteorological Organization, Geneva, Switzerland. The Co-Presidents welcomed participants to the session, and introduced the Deputy Secretary-General, Mr Jeremiah Lengoasa, to address the session.

1.1.2. Mr Lengoasa welcomed participants in the JCOMM Management Committee session to WMO. Mr Lengoasa noted the priorities of the Organization that were identified and reaffirmed at the 16th WMO Congress, including the establishment of a Global Framework for Climate Services (GFCS), full integration of the Quality Management Framework (QMF) into the wider WMO Strategic and Operational Planning and enhanced services in coastal zones, and encouraged the Committee to provide guidance for the Commission to contribute to these efforts. Appreciating the joint efforts of marine meteorological and oceanographic communities through JCOMM, Mr Lengoasa reaffirmed WMO's full support for JCOMM to carry out its work in the ongoing priority areas such as the implementation of the ocean observing systems, developing standards and best practices jointly with the IOC International Oceanographic Data and Information Exchange (IODE), and safety information services for marine and coastal communities. He also noted the importance of Capacity Building throughout the overall programme, and urged the Commission to continue strengthening its activities in this regard.

1.1.3. Mr Lengoasa concluded by re-emphasizing a key challenge for WMO and IOC; to contribute through JCOMM to the objectives of Members'/Member States' national development plans and to those of the major international strategies, as well as to promote scientific advances in marine meteorology and oceanography. In this context, he urged JCOMM to ensure wider participation of Members / Member States - particularly developing countries - in the work of the Commission. Mr Lengoasa closed his remarks by wishing participants a successful meeting.

1.1.4. The list of participants in the session is provided in *Annex I* to this report.

1.2. Adoption of the agenda

1.2.1. The Committee adopted its agenda for the session based on the provisional agenda that had been prepared by the Secretariats. This agenda is provided in *Annex II* to this report. The Co-President noted that the focus during this session was given to the preparation of JCOMM-IV, in particular, to documenting the achievements and future priorities of the Commission. It was requested to keep all reporting to a minimum, focussing on key strategic issues, and activities within the Programme Areas (PAs) where the views and/or decisions of the Management Committee where required to facilitate progress.

1.3. Working arrangements

1.3.1. The Committee agreed on its hours of work and other practical arrangements for the session. It was agreed that breakout groups may be established in the course of the session, as and when required, to deal with specific issues. The documentation was introduced by the Secretariats.

2. REPORTS BY CO-PRESIDENTS AND SECRETARIATS

Reports by Co-Presidents

2.1. The Committee noted with appreciation the report by the Co-Presidents of JCOMM, Dr Peter Dexter. He reported primarily on his activities since MAN-VIII (2010) in support of JCOMM, noting that this report did not include activities reported on and issues raised in other documents, including the reports of the PA Coordinators and the Secretariat, and the document on the results of Congress and the Assembly, except to provide a personal perception and view where appropriate. These activities included: participation in the annual meeting of the presidents of WMO technical commissions; participation in both the WMO Congress and IOC Assembly as JCOMM co-president, and presentation of a JCOMM report to both governing body sessions; coordination with WMO Commission for Agrometeorology (CAgM) in preparations for a Workshop on Climate and Oceanic Fisheries, Rarotonga, October 2011; coordination with the Secretariat in negotiations for the hosting of JCOMM-IV in Korea in May 2012, as well as preparation of initial documentation for the session; and hosting of JCOMM related meetings in Australia.

2.2. The Committee noted the new governance structure for the Global Ocean Observing System (GOOS) adopted by the IOC Assembly, and expressed appreciation that JCOMM, through the co-president, had an ex-officio membership of the new GOOS Steering Committee (GSC), the primary coordination mechanism for GOOS, reporting directly to the IOC Governing Bodies. Related discussion is recorded under agenda item 5.3. It reiterated the willingness of JCOMM to remain a primary implementation body for GOOS, and looked forward to working with the new GSC in this implementation.

2.3. The Committee noted and supported the co-president's view that the priority issues for JCOMM in the coming intersessional period would include input to GFCS implementation, disaster risk reduction, WIGOS implementation, and capacity development. These issues and others are discussed in detail under specific agenda items. Finally, the Committee noted that the co-president for oceanography, Alexander Frolov, resigned on 1 June 2011, following his election as acting member of the WMO Executive Council, and the co-president for meteorology, Peter Dexter, would complete his term of office at JCOMM 4. This will necessitate elections for both positions at the session. The Committee reviewed possible candidates for the positions, and its views are recorded under agenda item 5.2.

2.4. The Committee expressed its appreciation to the Co-President for his contribution and service to the commission.

Reports by the Secretariats

2.5. The Secretariats reported on activities undertaken during the year since the previous Management Committee in support of the implementation of the work plan of the Commission, as well as other activities in both WMO and IOC in which JCOMM was involved. The report also covered significant events planned during the current intersessional period. These past and planned events are listed at http://www.jcomm.info/calendar. The planned meetings and activities from this Session until JCOMM-IV (23-31 May 2012) include:

- 26 – 30 September 2011: 27th session of the Data Buoy Cooperation Panel (DBCP-XXVII), Geneva, Switzerland

- 3 - 5 October 2011: International Workshop on Climate and Oceanic Fisheries, Rarotonga, Cook Island

- 3 - 5 October 2011: 31th Session of the Argos Joint Tariff Agreement (JTA-31), Geneva, Switzerland

- 3 - 6 October 2011: Joint WMO-IACS/IMO Conference on "Extreme Seas" project, Geneva, Switzerland

- 10 - 14 October 2011: 7th TCP-JCOMM Regional Workshop on Storm Surge and Wave Forecasting (SSW-7), Macao, China

- 31 October - 4 November 2011: 12th International Workshop on Wave Hindcasting and Forecasting & 3rd Coastal Hazard Symposium, Hawaii, United States

- 7 - 11 November 2011: 12th Session of the GLOSS Group of Experts (GLOSS GE XII) and associated Workshop, Paris, France

- 8 - 11 November 2011: 6th session of the Services and Forecast Systems Program Area Coordination Group (SCG-6), Seoul, Korea Rep

- 28 November - 1 December 2011: Stakeholders Workshop for JCOMM-CHy Coastal Inundation Forecasting Demonstration Project (CIFDP-BSW), Dhaka, Bangladesh

- 28 November - 2 December 2011: Workshop for a new Marine Climate Data System (MCDS), Hamburg, Germany

- 5 - 9 December 2011: EUMETSAT/IODE Training Course (provisional), Ostend, Belgium

- 12 - 16 May 2012: 2nd international symposium on “Effects of climate change on the world’s oceans”, Yeosu, Korea Rep.

2.6. The Committee noted substantial changes in both WMO and IOC Secretariat staffing and human resources. Recognizing both positive and negative implications of these recent changes, the Committee noted with concern the need for human resources in the IOC Secretariat in the short term to prepare and run the JCOMM-IV. The Committee urged IOC to proceed with the recruitment process through UNESCO for the relevant vacancy post without delay, and the secondment from Member State (China) for a support staff member to JCOMM.

2.7. The Committee noted that substantial efforts have been recently made by the IOC and WMO Secretariats to organize JCOMM-IV. Further details were discussed under agenda item 6.

2.8. The status of the Commission’s work plan (2010-2013), which was decided at JCOMM-III, was reviewed by the PA Coordinators, as reproduced in *Annex III*.

3. PROGRAMME PREPARATION FOR JCOMM-IV

3.1. Guidance and Requirements from WMO-IOC Governing Bodies

3.1.1. The 26th Session of the IOC Assembly (June 2011, Paris) congratulated JCOMM on its achievements, and supported the establishment of the Regional Marine Instrument Centres (RMICs). The Assembly also noted that the review of JCOMM had not been resourced by Member States, and therefore had not moved forward. In addition, the Committee recognized the ongoing challenge to emphasize and nurture JCOMM outcomes that appeal to the broad set of IOC Member State concerns.

3.1.2. The 16th Session of the World Meteorological Congress (May-June 2011) noted with appreciation the work accomplished by JCOMM during the past intersessional period, and reaffirmed the success of a jointly sponsored technical commission in bringing together the marine meteorological and oceanographic communities. Two resolutions on RMICs and Data Buoy Vandalism (Resolution 9 (Cg-XVI) and Resolution 25 (Cg-XVI)) were adopted, with parallel decisions taken later by the IOC Assembly. Congress also adopted Resolution 24 (Cg-XVI) on the Marine Meteorology and Oceanography Programme.

3.1.3. The Committee noted that, particularly in the area of services delivery, two areas of responsibility in the Parent Organizations should be considered; (a) monitoring and predictions, and (b) preparedness, response and planning. It noted that JCOMM's strength and responsibilities were primarily on the former, and the Commission could efficiently be linked and contribute to the latter area by building collaborative relationships with relevant WMO and IOC programmes. In this context, the Committee emphasized the usefulness of cooperation between JCOMM and IOC/ICAM programme as well as tsunami and sea level programmes, and recommended to strengthen the joint activities during the next intersessional period **(Recommendation)**. The Committee also decided that the PA Coordinators and relevant Expert Teams should formally review the "Prioritized Action Plan for Implementation of the Coastal Module of GOOS" that was recently compiled by the Panel for Integrated Coastal Observing (PICO), which had just been published, with a view to articulating JCOMM support of delivery of services in the coastal zone, in particular related to coastal hazards (**Action**).

3.1.4. Regarding the proposed external review of JCOMM, the Committee decided to report to JCOMM-IV that the external review was not possible due to a lack of extrabudgetary funding provided by Member States, and in the context of the 'self-review' process involved in preparations and conduct of JCOMM-IV, changing structures around JCOMM such as the formation of the GFCS and reform of GOOS, to not actively pursue an external review in the near term.

3.2. Programme Areas: Deliverables, Recommendations and Future Actions

Observations Programme Area (OPA)

3.2.1. The OPA Coordinator, Ms Candyce Clark reported on the work and achievements in implementing the OPA workplan. She introduced an outline of the OPA report to JCOMM-IV, focusing in particular on future priorities as well as key achievements.

3.2.2. It was recalled that the Global Climate Observing System Implementation Plan (GCOS-IP) is the foundation for JCOMM observing network implementation, and that a commitment to delivering climate quality data also meets other needs. The Observations Coordination Group has a clear role in advancing the feedback loop on cost and feasibility for new, incremental requirements, both by providing the negotiating space with the networks and in engaging in promising pilot projects with potential sponsors. This role will be increasingly important in the emerging Framework for Ocean Observations (FOO). New requirements must come with funding, while funding will come once requirements and gaps are well documented. The WMO Rolling Review of Requirements (RRR) must be used to promote with WMO Members the non-climate requirements for ocean data. This is accomplished by keeping the JCOMM Statement of Guidance up to date. Polar and GFCS requirements will also have to be considered by JCOMM. The Committee noted that the satellite supplement of the GCOS-IP is being reviewed, to be published by the end of the year. The 3rd GCOS adequacy report is planned for 2013/2014.

3.2.3. The Committee agreed that it was critical to ensure that the resources required to support the JCOMM Observing Programme Support Centre (JCOMMOPS) are maintained and diversified to guarantee integrated technical coordination for ocean observations (in situ as well as satellite). As requested by the Observations Coordination Group (OCG), a strategic and operating plan is being developed and will be presented to JCOMM-IV. The Committee noted that the innovative chartering activities of JCOMMOPS are also bringing some resources to JCOMMOPS, which might be used to support a new "Ship logistics coordinator" function in the next two years. The Committee noted that negotiations were currently under way with France for a new Memorandum of Understanding on support for JCOMMOPS.

3.2.4. While noting that the GCOS-IP focuses on variables, and the JCOMM OPA Implementation Goals (OPA-IG) translates the GCOS-IP into action, including specific recommendations on observing platform networks implementation targets, the Committee agreed that the OPA-IG Metrics (e.g. % of completion) should be routinely updated, and extended to

include variable based metrics **(Recommendation)**. The Committee also requested the OCG to work with the Commission for Basic Systems (CBS) Expert Team on the Evolution of the Global Observing System (ET-EGOS), the new GSC and other partners to identify the adequacy of the observations for particular purposes **(Action)**.

3.2.5. The Committee requested that the OPA Coordination Group (OCG) should develop quantitative information in terms of ship time requirements (what is available, what is required, costs and so on) in order for JCOMM members to understand the challenges of maintaining the ocean observing networks, and to be in a position to make informed recommendations to Members/Member States **(Action)**. The Committee also suggested that OCG through the JCOMMOPS and other support centres make information available regarding the risk or duration of active in situ observing platforms in order to demonstrate the need for continuous investment to sustain the observing networks **(Recommendation)**.

3.2.6. Based on the Resolutions adopted by both IOC Assembly and WMO Congress in 2011, the Committee agreed that JCOMM needed to become pro-active in establishing new RMICs in all regions, in addition to the existing RMICs in the United States and China, and particularly in RA-III, RA-V, RA-VI **(Action)**.

3.2.7. The Committee requested the OPA through the OCG to investigate how training information (e.g., instrument practices, network implementation, data exchange) can be added to OceanTeacher (**Action**) by the end of 2011. During subsequent discussions on the restricted availability of GTS datasets, despite the WIS principle of free and open distribution of observations, the Committee agreed to take to JCOMM an action to improve access to near-real-time ocean observations, in integrated datasets, by all scientific and operational users (including researchers, non-meteorological agencies and tsunami warning focal points) (**Action**, see also Agenda Item 4.1).

3.2.8. The Committee endorsed the OPA priority and plans described in the outline of the OPA report to JCOMM-IV (*Annex IV*), and requested the OPA Coordinator to work with the Coordination Group to finalize the report to JCOMM-IV along with the agreed outline by the Committee **(Action)**. The Committee thanked Ms Candyce Clark and observing programmes for their active pursuit of the Commission's intersessional work plans.

3.2.9. The Committee received a brief presentation by Dr Eric Lindstrom on currently available satellite constellations for key ocean variables:

- Salinity: Aquarius/SAC-D launched on June 10th and joins SMOS on orbit as surface salinity sensors. The first salinity data are being analyzed from the Aquarius radiometer and look very promising.

- Altimetry: China recently launched HY-2 with an altimeter and scatterometer. Data are not yet available. Jason-1 is nearing end-of-life and will be re-purposed as a geodetic mission after the successful launch and commissioning of SARAL/AltiKA (India/France) in 2012. Jason-2 is maintaining the sea level climate data record and is in good health at the end of prime mission (3 years after launch). Its replacement, Jason-3, is now planned for 2014 launch. It has incurred some delay due to funding issues.

- Winds: QuikSCAT remains on orbit as a calibration standard for maintaining the wind climate record. ASCAT continues in good health and is joined by OSCAT on OceanSat-2 (India) which has been calibrated using QuikSCAT and is providing good global data in near-real-time. HY-2 scatterometer data have not yet been assessed.

- Sea Surface Temperature: The Group for High Resolution Sea Surface Temperature (GHRSST) has been approved as the mechanism for providing CEOS with a Virtual Constellation for sea surface temperature. Concerns remain about potential gap in microwave Sea Surface Temperature (SST) data.

- Gravity: GRACE mission is nearing end-of-life with battery losses leading to data gaps. Its measurement of the time-varying gravity field will likely suffer from a data gap until a follow-on mission launches in the 2017 period. The European Space Agency (ESA) GOCE mission has successfully mapped the marine geoids to unprecedented resolution.

Data Management Programme Area (DMPA)

3.2.10. The DMPA Coordinator, Ms Sissy Iona, reported on the work and achievements in implementing the DMPA workplans. She introduced an outline of the DMPA report to JCOMM-IV, focusing in particular on future priorities, as well as key achievements.

3.2.11. The Committee agreed that the DMPA must act as a bridge between the OPA and the Services and Forecasting Systems Programme Area (SFSPA), especially in terms of the data-flow. The Committee agreed that, while the DMPA has carried out such a role effectively and has planned to continue to improve data-flow to real-time and delayed mode end users, the Data Management Coordination Group (DMCG) should develop clearer ways to communicate with the end users and include it in the DMPA report to JCOMM-IV **(Action)**.

3.2.12. The Committee agreed that a systematic approach should be developed for sharing and exchanging variable-based ocean data-sets. It therefore requested the DMCG to develop new data flow metrics on "How ocean data are getting into the operational systems in real-time (quantity; timeliness)", and update the Data Management Plan to be submitted to JCOMM-IV **(Action)**.

3.2.13. The Committee approved the DMPA plan for developing a new Marine Climate Data System (MCDS) in the next ten years as a result of the Marine Climate Summaries Scheme (MCSS) modernization. The above recommendations in terms of data flow and metrics will have to be considered in this context. The Committee stressed that (i) the user base (e.g. traditional marine climate users, GFCS, re-analysis users, etc.) of the MCDS will have to be clearly defined, and (ii) the MCDS will have to be developed in such a way there will be no duplication, and that it will build on existing systems. In particular, discussions will have to be initiated with the with International Council for Science (ICSU) to address how the World Data Centres (WDCs) and their successors will be associated to the MCDS initiate. The Committee requested the Expert Team on Marine Climatology (ETMC) to take it into consideration at the planned MCDS workshop (Hamburg, Germany, Nov. 2011) **(Action)**.

3.2.14. The Committee requested the DMPA to finalize the "Oceanographer's cookbook for submitting ocean data in real-time and delayed mode" before JCOMM-IV (**Action**).

3.2.15. The Committee requested that the OCG and SCG to work with DMCG to update the "JCOMM Catalogue of Practices and Standards" **(Action)**.

3.2.16. The Committee noted that the ODP was now operational with more than 60 data-sets connected. Noting that the development of Version 2 (ODP/v2) was currently under way, the Committee invited CBS to address the issue of Compatibility between NetCDF and GRIB **(Recommendation)**. The Committee agreed that more centres should be invited to become WIS Data Collection and Production Centres (DCPCs), and suggested that connection to the GEOSS Common Infrastructure for data interoperability and sharing be investigated.

3.2.17. The Committee agreed that more homogeneous Quality Control between in situ and satellite data must be promoted **(Recommendation)**. This can be realized in the framework of JCOMM's contribution to WIGOS provided appropriate resources are committed by WMO and IOC towards this activity.

3.2.18. The Committee agreed that JCOMM should address the issue of data utilization: how to use the data, and what is the feedback from the user community (including Numerical Weather Prediction, NWP) in terms of impact, quality, etc **(Action)**.

3.2.19. The Committee endorsed the DMPA priority and plans described in the outline of the DMPA report to JCOMM-IV (*Annex IV*), and requested the DMPA Coordinator to work with the Coordination Group to finalize the report to JCOMM-IV along with the agreed outline by the Committee **(Action)**. The Committee thanked Ms Sissy Iona and members of the DMPA teams for their active pursuit of the Commission's intersessional work plans.

3.2.20. The Committee was informed of the planned workshop, organized by WMO, on the impact of observation on NWP, in USA in 2012, and recommended to follow up as needed **(Recommendation)**.

3.2.21. The committee expressed concerns about the staff reduction of IODE within 2012 who would be involved in assistance of the work of the DMPA.

Services and Forecasting Systems Programme Area (SFSPA)

3.2.22. Dr Ming Ji, SFSPA Coordinator, outlined programmatic drivers for JCOMM-IV for the Program Area, and reported progress and status of SFSPA projects. Most of the SFSPA projects were on track either to their successful completion or would achieve significant outcomes by JCOMM-IV.

3.2.23. Dr Ji also outlined proposed priorities for the next intersessional period which is expected to be driven strongly by the WMO strategic goal of implementing the Global Framework for Climate Services (GFCS). The Committee noted that a number of emerging opportunities have been arising for the SFSPA, many of which are aligned to potential JCOMM contributions to the GFCS, such as coastal hazards risk reduction. The Committee agreed to take these opportunities into account in the planning for next intersessional period, and suggested additional potential emerging areas including polar modelling and prediction, along with the WMO plan for implementing the Global Cryosphere Watch (GCW).

3.2.24. The Committee extensively discussed the potential JCOMM roles and contributions in the GFCS. The Committee emphasized that a unique characteristic of JCOMM is the ocean aspects in the Commission's core competency, reflected not only in the Commission's ocean observation mandate for broad time scales spanning from weather and seasonal-interannnual climate variability to long term climate change, but also in the Commission's mandate in coordinating operational ocean modelling/forecasting systems. The Committee recognized that these two core competency areas and mandates of the JCOMM are also critical elements for operational seasonal climate forecasting.

3.2.25. Therefore, the Committee considered a potential new strategic direction of including technical coordination for operational seasonal forecasting systems in National Meteorological and Hydrological Services (NMHSs) into its core portfolio. Such strategic realignment would also better integrate the JCOMM mandate in implementing ocean observations for climate and the GFCS element of improved operational seasonal forecast guidance from coupled global ocean-atmosphere models.

3.2.26. The Committee therefore agreed that JCOMM should be taking a proactive role in the ongoing high level process in developing the GFCS Implementation Plan in these areas. JCOMM should actively advocate its potential role through the GFCS Task Team under the WMO Executive Council that is responsible for the development of the Implementation Plan. This applied particularly for JCOMM's leading role in coordinating coupled global ocean-atmosphere seasonal forecast modelling systems in close partnerships with the World Climate Research Programme (WCRP), GOOS, and other WMO technical commissions such as the WMO Commission for Climatology (CCl) and WMO Commission for Agrological Meteorlogy (CAgM) **(Recommendation)**.

3.2.27. Taking into account the ongoing joint efforts by metocean and fishery communities through the International Workshop on Climate and Oceanic Fisheries (October 2011, Rarotonga, Cook Island), the Committee agreed that SFSPA should consider the potential for JCOMM contribution to the climate and fisheries as a part of a comprehensive JCOMM contribution to the GFCS, in collaboration with relevant programmes and bodies as necessary **(Recommendation)**.

3.2.28. The Committee endorsed the SFSPA priority and plans described in the outline of the SFSPA report to JCOMM-IV (*Annex IV*), and requested the SFSPA Coordinator to work with the Coordination Group to finalize the report to JCOMM-IV along with the agreed outline by the Committee **(Action)**. The Committee thanked Dr. Ming Ji and members of the SFSPA teams for their active pursuit of the Commission's intersessional work plans.

3.3. Cross-cutting activities within JCOMM

Task Team on Satellite Data Requirements (TT-SAT)

3.3.1. The Committee received a report on the activities of the JCOMM Task Team on Satellite Data Requirements (TT-SAT) that was established at MAN-VIII (2010). The Committee noted with appreciation and reviewed a detailed workplan of TT-SAT, leading to the preparation of a final draft report by early 2012 for presentation to JCOMM-IV and for documenting the findings of the Task Team including recommendations for improving the integration and comparison of satellite and in situ data.

3.3.2. The Committee agreed that JCOMM should focus on refining the satellite products, through gap analysis if necessary, so that they better comply with end user requirements **(Recommendation)**. In this context, the Committee advised that the TT-SAT should focus its efforts on products and the integration of in situ and satellite data to improve such products (e.g. in-situ input to satellite cal/val, blended products). The Committee recommended that JCOMM should play an active role in enhancing dialogue between in situ and satellite communities to activate these activities **(Recommendation)**. A good example is the Group for High Resolution Sea Surface Temperature (GHRSST), which has made focused efforts for improved products for one variable. They have been strongly supported by the space agencies and were making progress in their working relationship with in situ community such as DBCP. Noting that integrated in situ and satellite Surface Vector Wind (SVW) products would substantially improve the operational applications (including those of NWP, sea state forecasting and warnings, and coastal applications) that provide socio-economical benefits, the Committee requested the TT-SAT to setup a plan to establish a SVW group to function like the GHRSST, in close collaboration with the interested satellite and in situ communities, to be submitted to JCOMM-IV **(Action).** The Committee suggested that the TT-SAT review its expertise in the team to pursue the requested task, and if necessary, revise the membership to efficiently carry out the task **(Recommendation).** The Committee considered that JCOMM should keep such an approach for the satellite data/product requirements during the next intersessional period, in view of promoting such an approach to other parameter/products when the work of the Commission in this area becomes mature in the future.

3.3.3. The Committee agreed that JCOMM should maximize interactions with and utilizations of the existing mechanisms for dealing with satellites and satellite products (e.g. CBS ET-SAT & ET-SUP, CEOS, CGMS), in order to streamline the Commission's activities in this area and to efficiently deliver the requirements identified for ocean data acquisition and improved applications for service delivery **(Recommendation)**. In particular, the Committee agreed that better linkage was required between JCOMM and the various CEOS virtual constellation groups (e.g. tide gauge expert participation in the surface topography constellation). The Committee requested the TT-SAT to prepare a set of recommendations by JCOMM-IV, where necessary, on the work of JCOMM in this regard **(Action)**.

3.3.4. The Committee advised that TT-SAT should be focusing on documenting JCOMM non-climate requirements, as the climate requirements relevant to the work of JCOMM are well

documented as part of the GCOS Implementation Plan (2010 update) and its Satellite Supplement (currently under review), noting that JCOMM fully supports and provides input and feedback to the GCOS-IP **(Recommendation)**. In doing so, the Committee advised to replace "non-climate requirements" with "additional requirements" in the Terms of Reference of the Task Team so that the general non-GCOS requirements such as for the GFCS can also be taken into account **(Action)**.

3.3.5. The Committee advised that the broader ("technology free") requirements for satellite information should be addressed by JCOMM through the SFSPA and its Expert Teams, documented, and then brought to the higher JCOMM level for consideration by JCOMM members, and the Space Agencies. The Committee therefore requested Mr Ali Mafimbo, the JCOMM focal point for the Rolling Review of Requirements (RRR), to work with the Secretariat, SCG and Expert Teams to review and revise the JCOMM input to RRR as well as the Statement of Guidance (SoG) for Ocean Applications on the basis of the JCOMM User Requirements Document, in view of developing a brief document by JCOMM-IV for endorsement by higher level and wider community **(Action)**. The document should also include a statement of endorsement of existing and planned satellite missions, and associated products.

Quality Management

3.3.6. Ms Helen Tseros on behalf of Mr Bryan Boase, Activity Leader on QMF/QMS, reported on the status and results of the JCOMM Pilot Project for Quality Management of Marine Weather and Ocean Service that was conducted by Australian Bureau of Meteorology. She reported that a gap analysis has been conducted on both Marine Weather and Ocean Services (tsunami warnings are part of Ocean Services) that identified the gaps that exist between the requirements of the ISO 9001:2008 standard and the Section's current management system. A gap analysis tool (of which the Findings template is reproduced in *Annex V*) has been developed. It consists of a set of comprehensive questions that are divided into five sections that reflect the contents of the ISO 9001:2008. The Committee noted with pleasure that these tools and information would be available online through the new WMO webpage hosted by the Australian Bureau of Meteorology.

3.3.7. The Committee was also pleased to note that a report on the WMO Quality Management Task Team activities would be submitted to JCOMM-IV, as a deliverable from the pilot project. This report would explain the concept of "twinning partnership" with Members that have a mature QMS with those members who are commencing the development of a QMS.

3.3.8. The Committee noted with appreciation the "Marine Weather, Tsunami Warning and Ocean Services Quality Manual" as a key document of the QMS that would help to define the roles and responsibilities of the marine meteorological and ocean services. The primary role of the quality manual would be providing a detailed and comprehensive description of the Marine Weather, Tsunami Warning and Ocean Services QMS or a "roadmap" on how the section conducts its activities. The quality manual would also serve as an educational and induction tool for new staff.

3.3.9. Ms Tseros informed that the Australian Bureau of Meteorology's Marine Weather Services Section has undergone its first internal audit according to established procedures, the results of which were very encouraging. A second internal audit is scheduled before the end of 2011 and prior to the certification audit, and it is anticipated that certification of compliance for the pilot project will be achieved prior to JCOMM-IV being held in May 2012.

3.3.10. The Committee welcomed the successful conduct of the Pilot Project, and agreed that the Commission should take these results forward during the next intersessional period. Taking note of the case of the WMO Commission for Aeronautical Meteorology (CAeM) that has successfully led the QMF/QMS application in the associated services, it was recommended that the Commission should encourage NMHSs (while noting that the legal and regulatory implications

would be national decisions) to apply the developed framework of practice described in the new Practical Guide for the Implementation of the Quality management System for NMHSs **(Recommendation)**. In doing so, it was recommended that some Demonstration Project could be developed during the next intersessional period by the interested Members / Member States in the QM exercise for marine/oceanographic services, particularly in the developing countries **(Recommendation)**, in consultation with the Expert Team on Maritime Safety Services (ETMSS).

3.3.11. The Committee also agreed that a key element in further demonstration of the QMF was the training and capacity building throughout the whole process of establishing the QMF for marine meteorological and oceanographic services. It therefore agreed that virtual training material for marine QMF should be developed during the next intersessional period. Noting that the COMET module for general QMF was being utilized for staff training in some cases, the Committee requested the Activity Leader on QMF/QMS to work with COMET, WMO Education and Training Programme (ETRP), and IODE OceanTeacher to explore ways to develop such a module for (or to adapt the existing module to) marine and oceanographic services **(Action)**. Such a module would also be applied to assist national agencies to develop staff with appropriate competencies in these areas. Competency/qualification for marine forecasters could be included in this module as well. Further discussion on a related issue is described under Agenda Item 4.6.

3.3.12. The Committee unanimously agreed that the Commission should continue to have an Activity Leader on QMS/QMF to pursue the planned activities during the next interesessional period **(Action)**. The Committee also noted that this person should work closely with the Activity Leader on Capacity Building in developing training material and support the Demonstration Projects. Related discussion is recorded under Agenda Items 4.6 and 6.

Capacity Building

3.3.13. The Committee was presented with a brief report by Mr Hassan Bouksim, Activity Leader on Capacity Building, on the procedure for the compilation of capacity building activities. Taking into account the Organizations' need and requirements for capacity development and trainings, the Committee carried out a focused discussion on the Commission's plan for capacity development, training and education under Agenda Item 4.6.

4. JCOMM DELIVERABLES AND RECOMMENDATIONS ASSOCIATED WITH COLLABORATIVE PROGRAMMES, PROJECTS AND ACTIVITIES

4.1. Participation in and Collaboration with WMO Integrated Global Observing System (WIGOS), WMO Information System (WIS) and IOC/IODE Ocean Data Portal (ODP) Scientific and operational requirements

WIGOS and WIS

4.1.1. The Committee reviewed the status of WIGOS developments and noted the decision made by the WMO Congress (2011) to implement WIGOS during the period 2012-2015. The Committee noted that key areas to address in WIGOS implementation included (i) enhancing observing capabilities and quality control of the collected data through an enhanced cooperating with the Commission for Instruments and Methods of Observation (CIMO), (ii) improving and adding value to data and products (especially for climate applications), and (iii) improving data availability, access, and interoperability. The Committee noted that a dedicated ocean task team of the ICG-WIGOS would permit to make progress on such issues.

4.1.2. The Committee agreed that JCOMM would contribute to WIGOS implementation for the next intersessional period primarily through implementing the legacy recommendations of the JCOMM Pilot Project for WIGOS. This includes:

(i) Legacy recommendation 2: The WMO and IOC Publications regarding instrument practices related to buoy measurements would be reviewed by Mr David Meldrum and

by the Secretariat, by the end of December 2011 **(Action)**.

(ii) Legacy recommendation 3: The Committee agreed that the DMCG should draft a Recommendation for JCOMM-IV to strongly encourage that instrument/platform metadata from ocean observing platforms (particularly those regarding SST and SSS) are properly collected, and made available through the appropriate channels **(Action)**.

(iii) Legacy recommendation 5: Based on the experience in establishing RMICs in China (for the Asia Pacific Region, and RA-II) and USA (for RA-IV), and considering the proposal from Morocco to host an RMIC in RA-I, the Committee agreed that JCOMM should become pro-active in the process of establishing an RMIC network in other regions. The Committee agreed that the Commission (through JCOMM-IV) should request the WMO Secretary General and IOC Executive Secretary to write to targeted countries inviting them to offer to host RMICs in their region (***Action).***

(iv) Legacy recommendation 12: The Committee noted CBS leadership in the development of an International Forum of Users of Satellite Data Telecommunication Systems. The Committee invited the CBS to speed up the process and realize establishment of the forum sooner than presently planned (**Recommendation**).

(v) Legacy recommendation 14: The Committee agreed that all Programme Areas should be involved in the implementation of the JCOMM Partnerships for New GEOSS Applications (PANGEA) concept and share resources **(Recommendation)**.

4.1.3. The Committee agreed that there was a need to keep track of the institutional arrangements for making sure the data are flowing to the end users. Some monitoring activity is needed is this regard, and the Committee requested the OCG and DMCG to investigate options and propose recommendations for JCOMM-IV to establish and/or enhance an appropriate monitoring activity **(Action)**. The Committee also expressed concerns that the current operational flow of ocean data (e.g. through the GTS) does not always permit for end users such as researchers to access the distributed data, despite the fact that in many cases these same researchers are contributing their own data to the global system, as access to the systems is very often restricted on a national basis to specific operational users, despite WMO and IOC data policies calling for free and unrestricted data exchange (e.g. marine data are regarded as essential according to WMO Res. 40 (Cg-XII)).

4.1.4. The Committee recognized that the WIS is supposed to address such issues, but noted with concern that despite operational implementation of the WIS, practical access to GTS data, and to aggregated sets of such data, at the national level may continue to be restricted in some instances. A vision is needed for an ocean data management system based on operational systems such as the WIS and its GTS to fully address the needs of all end users, including beyond the WMO (NMHS) community. The Committee requested the WMO Secretariat to address this issue to JCOMM-IV, with a view to its recommending to Members/Member States to put appropriate resources into making sure that the data collected nationally can be easily accessible by international end users **(Action)**.

4.1.5. The Committee recommended that the strategy being developed by the DMPA for a new Marine Climate Data System (MCDS) should also take these concerns into account, with a view to improving the situation relatively quickly **(Action)**. The Committee also noted that centres which are doing the ocean observing system monitoring are in principle capable of compiling data sets and serving them. Authoritative JCOMM data sources must eventually be recommended and therefore be part of the MCDS strategy.

4.1.6. The Committee requested the OCG, with assistance from the DMCG, to investigate these concerns regarding operational ocean data flow, identify weaknesses and problems, and propose practical solutions to JCOMM-IV, while documenting outstanding issues (**Action**).

Ocean Data Portal (ODP)

4.1.7. The IODE Co-Chair, Mr Ariel Troisi, reported on the status of the IODE Ocean Data Portal (ODP[1]). Much progress was made in ODP development through the activities of the IODE/JCOMM Expert Team on Data Management Practices (ETDMP) and the JCOMM Pilot Project for WIGOS. 12 data providers and 60 data-sets are now visible and accessible through the ODP. Version 1 is now fully operational (live demonstration was made during the meeting), and Version 2 is planned to become operational in mid-2012. ODP is developed in such a way to become fully interoperable with the WIS as a Data Collecting and Production Centre (DCPC). Offering an ODP node involves installing the ODP Data Provider Software, or simply using the ODP Light Data Provider (LDP), which does not require installation of software. Full documentation, and comprehensive training materials, are available on the ODP website. The MAN noted with appreciation that IODE-21 had approved the ODP workplan for 2011 to 2013. The IODE is now focusing on installing ODP nodes in the regions.

4.2. Maritime Safety Services

4.2.1. The Committee reaffirmed JCOMM's top priority on strengthening met-ocean services in support of the safety of life and property at sea and in coastal areas, as required under the International Convention for the Safety of Life at Sea (SOLAS). The Committee noted with appreciation the significant progress during the intersessional period in expanding the Global Maritime Distress and Safety System (GMDSS) to include five new Arctic Ocean METAREAs, thus enabling provision of weather and sea ice safety information service. . The expanded GMDSS coverage is operational since 1st June 2011 for the 5 Arctic METAREAs. The related Maritime Safety Information (MSI) are, or will be very soon, available on the JCOMM GMDSS website (http://weather.gmdss.org). This would be a major achievement of the Commission's work to be reported at JCOMM-IV.

4.2.2. The Committee noted that the 2010 Edition of the revised IMO/IHO/WMO Manual on Maritime Safety was published with considerable input from the ETMSS, which responded to Recommendation 7 (JCOMM-III). The ongoing development of an IMO/WMO Worldwide Met-ocean Information and Warning Service (WWMIWS) would complement the existing IMO/IHO Worldwide Navigational Warning Services (WWNWS IMO resolution A.706(17)). The WMO Executive Council has adopted the WWMIWS at its 62nd session in June 2010. It has also been submitted to IMO/MSC, at the end of 2010, which requested its COMSAR sub-committee to review it before its adoption by MSC at its 89th Session in May 2011. The official adoption by IMO Assembly is expected before the end of 2011, and the WWMIWS will be included in the regulatory publications as an IMO resolution, expected to come into force in 2012. The JCOMM Expert Team on Maritime Safety Services (ETMSS) is in charge of evaluating proposed amendments, prior to the review/endorsement by the WMO and IOC governing bodies. The Committee agreed that JCOMM should continue its efforts in establishing the WWMIWS as an integral component of the MSI disseminated to marine users through the GMDSS Marine Broadcast System, during the next intersessional period **(Recommendation)**.

4.2.3. The Committee emphasized the important to maintain direct interaction with and obtain feedback from the marine users, and in this context, the need to continue the regular Marine Meteorological Monitoring Survey (MMMS). The Committee reviewed the draft questionnaire and approved it with minor modifications. The survey would be conducted until December 2011 through the national Port Meteorological Offices (PMOs) via online survey, as well as through the traditional means, with the results to be reported at JCOMM-IV **(Action)**. The Committee requested the Secretariat in consultation with the ETMSS chair to approach the IMO, IHO and other international programmes that maintain direct contact with the users of maritime safety information, in order to obtain maximum feedback to the survey **(Action)**.

4.2.4. Following the decisions at JCOMM-III including the Recommendations 7, 9, 10, 11 and

[1]: www.oceandataportal.org

13 (JCOMM-III), the WMO Manual on Marine Meteorological Services (WMO-No. 558) has been reviewed and updated for the publication of a new edition. A large part of the amendment includes the updated information and procedures for maritime safety services. The Committee was pleased to note that the new edition of WMO-No. 558 would be published electronically by December 2011, and the update of the WMO Guide to Marine Meteorological Services (WMO-No. 471) before JCOMM-IV.

4.2.5. The Committee noted that, also pursuant to the Recommendations 7 and 8 (JCOMM-III) and related decisions, a quality management approach to the delivery of marine weather and ocean services should continue to be a priority during the next intersessional period (see also discussion under Agenda Item 3.3). While recognizing the importance of training on Quality Management System (QMS) for maritime safety services, such as the first JCOMM Maritime Safety Services Enhancement Workshop (May 2010, Australia), the Committee considered that the activities during the next intersessional period should be planned in a cost-effective manner, and agreed that the Commission's efforts in establishing a marine QMS should primarily focus on developing training material and procedure **(Recommendation)**.

4.2.6. The Committee noted the ongoing collaboration between WMO, IMO and IHO to plan and develop the e-Navigation, and agreed that JCOMM should continue working to further define the required met-ocean variables/information to feed the system, with product specification (definition/standards for compatible formats) **(Recommendation)**.

JCOMM's role in Marine Environmental Accident Responses

4.2.7. The Committee recalled that one of JCOMM's essential tasks is supporting the Marine Pollution Emergency Response Support System (MPERSS) as well as maritime search and rescue (SAR) operations. The current MPERSS capability and framework of the Area Meteorological and Oceanographic Coordinators (AMOCs) focused on providing drift forecasts for oil spills or objects (containers, ships, men at sea...) together with basic marine weather ocean forecasts to aid response activities. At JCOMM-III, it was decided to put this task under the Expert Team on Maritime Safety Services (ETMSS) and Expert Team on Operational Ocean Forecast System (ETOOFS), instead of through an independent Expert Team (previously Expert Team on Marine Accident Emergency Support: ETMAES).

4.2.8. Considering recent events of marine environmental incidents such as the radiation leak at Fukusima, the Committee noted that the current arrangement and capabilities in JCOMM coordination demonstrate a major gap in MPERSS. The Committee agreed that JCOMM should take a more active and coordinated role in responding to marine environmental accidents **(Recommendation)**.

4.2.9. The Committee noted that the coordination responsibility should stay in the ETMSS (the coordination of global and regional services) and ETOOFS (providing scientific and technical guidance to streamline the framework, such as review and re-defining required essential meteorological information and currently available tools and models). It considered that, while the existing structure and distributed responsibilities by areas identical to the METAREAs could possibly integrate the services related to MPERSS/AMOC, the services and information for some marine environment issues needed to be dealt on an ocean basin scale, such as tracking radio-active material. The Committee suggested taking this aspect into account in developing a JCOMM strategy for its intersessional work related to a wider range of marine pollution emergencies.

4.2.10. After discussion, the Committee agreed on the general direction of the Commission's work during the next intersessional period as described in the draft outline as *Annex VI*, and requested the SCG and the WMO Secretariat to finalize this outline to be submitted to JCOMM-IV **(Action)**. The Committee agreed that a full strategy document for JCOMM activities on marine accident emergency should be developed and implemented based on this outline, during the next intersessional period **(Action)**.

4.3. Marine and Coastal Hazards

4.3.1. The Committee recalled that both WMO and IOC recognized the increasing requirements to JCOMM in coordination/support for developing and improving forecasting capabilities and service delivery in coastal risk reduction. Also considering the emerging importance of coastal zones in delivering the climate services in the framework of GFCS, as well as the potential role of JCOMM in this area, the Committee agreed that JCOMM should set the work related to marine and coastal hazards as priority during the next intersessional period **(Recommendation)**.

4.3.2. The Committee noted that the ETMSS and ETWS had been requested at JCOMM-III to develop proposals to include information on complex sea states as well as associated terminology in weather and sea bulletins to be disseminated through SafetyNET and NAVTEX. It encouraged the Teams to carry out this task during the intersessional period and thereafter, with a view to including the amendment of the WMO Manual on Marine Meteorological Services (WMO-No. 558) **(Action)**.

4.3.3. The Committee noted that the Storm Surge Watch Scheme (SSWS) serves as a regional framework for technical advisories for coordinated operational services for storm surge forecasting and warning, which is the core element of JCOMM contribution to the coastal hazard management. The practice was incorporated to that of the tropical cyclone advisory scheme, through the RSMCs for Tropical Cyclones, particularly in RA V (South Pacific / South-East Indian Ocean), RA II (Asia Pacific) and RA I (Africa). The Committee requested that JCOMM should continue its joint effort with the Tropical Cyclone Programme (TCP) to support the SSWS, including the series of training workshop on storm surge and wave forecasting **(Action)**.

4.3.4. The Committee noted that the South and East African coast suffers from recurrent coastal inundation by storm surges. Taking into account the ongoing request from the region for technical support and trainings, as well as the recent dialogue at the Climate Change workshop and the effects on African Coastal communities (August 2011, South Africa), the Committee agreed to make further efforts to provide training opportunities in the region of concern, by holding the next JCOMM/TCP training workshop on storm surge and wave forecasting for the South/East African and West Indian Ocean countries **(Action)**.

4.3.5. The Committee emphasized the importance of capacity development in pursuing this line of work, as well as addressing the regional aspects. In this context, the Committee agreed that the Commission should continue preparing and updating technical guidance material such as the “Guide to Storm Surge Forecasting” (and its dynamic part) **(Recommendation)**. It also recommended that the Commission should provide enhanced support for the time-bound demonstration/pilot projects addressing regional issues of concern, based on strong participation of the Members / Member States, in close coordination with relevant programmes **(Recommendation)**.

4.3.6. The Committee recognized that the Expert Team on Wind Waves and Storm Surges (ETWS) has played the leading role in this area, and anticipated that the ETWS would be required to extend its activities during the next interesessional period (**Recommendation**, see also discussion under Item 5.1). Considering the recent interaction between the ETWS and the multi-hazard Task Team of the North-East Atlantic and Mediterranean Tsunami Warning System (NEAMTWS), the Committee also recognized that it might be timely to extend an invitation by JCOMM to the working groups and/or task teams of the Intergovernmental Coordination Groups of Tsunami Early Warning and Mitigation System. The IOC Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG) may be an appropriate group to partner with JCOMM in dealing with multi-hazard forecast and warning issues **(Recommendation)**.

JCOMM/CHy Coastal Inundation Forecasting Demonstration Project (CIFDP)

4.3.7. The Committee noted progress of the CIFDP. Pursuant to Recommendation 6 (JCOMM-III), this project was initiated jointly by JCOMM and the WMO Commission for Hydrology (CHy) in 2009, aiming to develop a comprehensive and integrated approach for marine multi-hazard forecasting and warning systems and coastal risk management. The Project has recently regained momentum, particularly for its implementation in the Bay of Bengal (Bangladesh). The Project Steering Group (PSG), chaired by Drs Val Swail and Don Resio, have been working to streamline the concept and overarching implementation plan, of which the results are summarized on the Project website: http://www.jcomm.info/CIFDP.

4.3.8. The CIFDP was being designed and was moving toward implementation with a clear strategy, that :

- A sub-project would be launched for a country that meets the essential requirement for initiating a national agreement - between national institutions with related duties, such as forecasting, warning, and disaster management – and a provisional establishment of a sub-project National Coordination Team (NCT) that includes operator(s) of the NMHS. This is defined as “Phase 0” of the CIFDP Implementation Plan (see the project website on the afore-mentioned address);

- Users’ perspectives and requirements should be considered from the initial phase of the sub-project development;

- Only existing and available open source techniques will be considered, taking into account the identified national/regional requirements and gaps. Final products of the Demonstration Project should be operated and maintained by a national operational agency which has the responsibility/authority of storm surge warning and flood warning

- The developed procedure / best practice through a sub-project should be applicable to other (neighbouring) countries with common issues and interest

- Each sub-project should be closely linked / cooperating with the related projects and activities. For example, CIFDP implementation would enhance effective use of the improved NWP products in a region provided through the Severe Weather Forecasting Demonstration Project (SWFDP) process and its regional centres, and would build the “cascading forecasting process” to produce services for coastal zones.

4.3.9. The Committee was pleased to note the development of the first sub-project for Bangladesh (“Phase 1”). The BMD will host a stakeholders workshop in Dhaka, Bangladesh, from 18 November to 1 December 2011, of which the expected outcome includes: (i) a Definitive National Agreement (DNA) for CIFDP implementation in Bangladesh; (ii) a set of requirements for improved coastal inundation forecasting in Bangladesh / Bay of Bengal; and (iii) an outline for a detailed Implementation Plan of a Bangladesh sub-project for CIFDP (including the choice for technical solutions to address national/regional requirements), to be a baseline for a project proposal to funding agencies. The NCT in cooperation with the PSG will complete the Plan soon after the workshop. A sub-project for Dominican Republic (Caribbean region) was also being initiated, with similar objectives and design.

4.3.10. The Committee noted that strong national participation (leading the NCT in collaboration with the PSG) and extrabudgetary contributions for expert activities are necessary to successfully implement the Project, therefore agreed that JCOMM-IV should strongly encourage Members / Member States with concerns of coastal inundation to consider participating in the Project **(Recommendation)**. In this context, the Committee requested that, once the project was successfully implemented in the first sub-project, the established procedure and best practice should be well documented to guide Members / Member States of interest **(Action)**. The Committee also recognized potential challenge of data availability (e.g. tide gauge measurements, bathymetry data) in the implementation of the Project and application of the results in the region,

and requested the PSG and NCT to consider the related issues at the planned stakeholders workshop **(Action)**.

4.3.11. The Committee noted the key role of SFSPA particularly its ETWS in the CIFDP design and implementation phases, and supported the strengthened support for this area by the Commission and by the Secretariat during the next intersessional period **(Recommendation)**. The Committee also recommended that the ETWS members involved in the CIFDP/PSG should consider working with the Global Sea Level Observing System (GLOSS) community and scientists in the relevant field to resume the work of establishing storm surge climatology during the next intersesssional period, in view of its important potential contribution to GFCS **(Recommendation)**.

4.4. Global Framework for Climate Services (GFCS)

4.4.1. Dr Geoffrey Love, Director of the Weather and Disaster Risk Reduction Services Department (WDS), provided a brief report on progress in the establishment of a Global Framework of Climate Services (GFCS). The Committee noted, pursuant to relevant decisions of WMO Congress at its 16th session (2011), that a GFCS Office has been established within the WMO Secretariat, in order to coordinate the activities of the WMO Secretariat and serve as the point of contact on GFCS matters with Members, the UN system and various stakeholders. This Office would also facilitate the range of activities to support the development of the GFCS draft implementation plan and to prepare the Extraordinary Session of World Meteorological Congress in the last quarter of 2012.

4.4.2. The Committee noted the ongoing consultation process to ensure the engagement of various stakeholders in the development of the draft implementation plan of the GFCS. A consultation under the Observations and Monitoring component of the GFCS was held in August 2011 at the WMO headquarters in Geneva, and two consultations for the User Interface Platform were planned for September 2011 in Rome (water and food security) and November 2011 in Geneva (on health and Disaster Risk Reduction: DRR). The Committee also noted the capacity development consultation scheduled for 10 – 12 October 2011, in Geneva.

4.4.3. The Committee noted the near term timeline on the GFCS Implementation Plan: in mid-October 2011, the Executive Council (of WMO) Task Team on GFCS would agree on the outline for the draft as well as the process and requirements (including writers and experts to be involved), and a Zero Order draft of the draft Implementation Plan including the governance aspects would be available for review and comments by mid-February 2012. A First Order Draft for submission to WMO Executive Council would be circulated for review from April to June 2012, in order to finalize the Plan by the end of August 2012 and submit to the Extraordinary Session of the WMO Congress in 2012. The Committee considered that JCOMM as a Technical Commission should provide input to and be engaged in the drafting process, and agreed that the Co-President should organize JCOMM review of and input to a Zero Order draft in consultation with the Committee members (in February 2012, after the WMO meeting of the Presidents of Technical Commission) and thereafter **(Action,** see also paragraph 3.2.25**)**.

4.4.4. The Committee emphasized the critical importance of ensuring a wide range of participation of the International Organizations and Programmes dealing with climate issues, considering that expertise in the WMO community would cover a partial component of the climate issues and would need partnership to address the entire range and to maximize the impact/influence of the established GFCS **(Recommendation)**. The Committee noted that JCOMM has a role here to facilitate engagement of and interaction with the user groups and the entities to JCOMM that are interested in climate services.

4.5. Deliverables and Recommendations for Scientific and Technical Development

4.5.1. Under this agenda item MAN reviewed the new and ongoing initiatives that comprised its technical workplan. These initiatives included databases, technical documentation and guides, and pilot projects. The complete list is attached as *Annex VII*. Examples of initiatives included:

- a comprehensive review and update of relevant IOC and WMO manuals and guides (OPA);
- an intercomparison of AWS systems on board ships (OPA);
- the establishment of *an inter*-agency forum of users of satellite telecommunications systems (OPA);
- the initiation of a joint DBCP-GHRSST High Resolution SST pilot project (OPA);
- a modernisation of the Marine Climate Summaries Scheme (DMPA);
- the initiation of a Coastal Inundation Forecasting Demonstration Project (CIFDP) (SFSPA);
- the possible establishment of a pilot project to use future submarine cables for ocean/climate monitoring and disaster warning (OPA).

4.5.2. Regarding this last initiative, the Committee received a brief report from Mr David Meldrum, Vice-chair of the Observations Coordination Group, on a joint IOC/ITU/WMO workshop that had addressed this theme. The outcome of the meeting had been to approve the formation of a task team to identify ocean / climate / disaster warning needs, investigate the technical feasibility of equipping cable repeaters with suitable sensors, and sketch out a possible pilot project. The aims of the pilot project would be both to reassure cable operators that the addition of sensors would not impact their normal operations, and to demonstrate the benefits that would accrue to the observing and disaster warning agencies. In this regard, the project would likely focus on tsunametry because of its potential to demonstrate a high value outcome and the vulnerability of present systems to vandalism. The Committee thanked Mr Meldrum for his efforts and asked that he pursue this initiative in collaboration with the ITU and WMO **(Action)**.

4.6. Support for Technology Transfer and Capacity Development

4.6.1. Noting that capacity building is a high priority for both WMO and IOC, the Committee recalled that the Commission's activity in this area has been focusing on programme support and implementation/delivery through the Programme Areas (PAs). The Committee agreed that this general direction and principles should be kept for the next intersessional period **(Recommendation)**, and that the Commission should in addition make enhanced efforts through the following type of activities:

- Preparation and management of technical guidance material, in conjunction with the regular review and update of the Guides and Manuals (see also Agenda Item 3.3);
- Development of a web-based tool to document/consolidate/visualize overall Capacity Building activities of the Commission, particularly those initiated and directly supported by the Members / Member States. As the first draft outline, the Committee reviewed and revised a consolidated list of JCOMM CB activities as reproduced in *Annex VIII*, in view of regularly updating the contents;
- Enhanced support for the time-bound projects with clear objectives and plans for delivery, which serves for Members' / Member States' capacity development and technology transfer (see also Agenda Item 4.3);
- Strengthened liaison and contacts with the wider WMO-IOC capacity development programmes, through an active member of the Management Committee and with the support of the Co-President and the Secretariat, particularly for the application of developed marine meteorological and oceanographic training material and for the

development of training programmes.

4.6.2. The Committee requested that the Activity Leader on Capacity Building and the Secretariat, under the guidance of the Co-President, revise the current version of the JCOMM Capacity-Building Principles taking into account the above points **(Action)**.

4.6.3. Dr Jeffrey Wilson, Director of the WMO Education and Training Programme (ETRP), introduced the topic of competencies, particularly in the context of marine forecasters, which is closely linked to the issue of the Quality Management System as well as the training/education. At the 16th Congress (2011), WMO Members revised the definition of meteorologist and meteorological technician and approved the development of Standards outlining the learning outcomes and characteristics of courses that would enable people to meet the definitions. Each WMO Member was to make their own decision on the formal education standards of meteorologists and meteorological technicians and what tasks personnel in each of these classifications undertook, provided that it could be shown that the personnel addressed any minimum qualification and competency (knowledge, skills and behaviours) requirements required in that field. These changes need to be seen in the context of the decision by the WMO Executive Council in 2010 that it was up to each Technical Commission to set the generic competencies of personnel undertaking tasks in the domain covered by that Technical Commission. Therefore JCOMM was in a position to specify the competency and qualification requirements for personnel working in the domain covered by JCOMM. The WMO Executive Council called upon its Panel of Experts in Education and Training to assist the Technical Commissions as required.

4.6.4. The Committee noted that the requirements for qualification and competency, as well as the specific requirements/need for training should be firstly defined through consultation with the national forecasters and related operators as “users”. It therefore requested that the Activity Leader on Capacity Building initiate a survey for such purposes, in close collaboration with the WMO/ETRP and IOC/IODE for developing the survey and distribution/feedback collection **(Action)**. The collaboration should be extended to the follow-up actions, such as developing and update of training material. Recalling the related discussion on QMF, the Committee requested the Activity Leader for Capacity Building to work closely with the Activity Leader on QMF/QMS in order to integrate with and utilize the already developed tools such as the COMET module **(Action)**.

4.6.5. The Committee received a brief introduction by Dr Tim Spangler, Director of COMET, on the COMET module containing the marine meteorological and oceanographic elements, followed by a presentation by Mr Ariel Troisi on the OceanTeacher module. The Committee appreciated the very efficient tools for presenting rich and descriptive contents offering great potential to improve the Commission’s capacity building activities, and agreed that JCOMM should enhance and/or ensure appropriate links with the WMO/ETRP and IODE/OceanTeacher for the Commission’s training activities, in order to benefit from current developments and to avoid overlapping and duplications **(Recommendation & Action)**.

4.6.6. The Committee was informed of the planned workshop on Capacity Development Requirements for GFCS (10-12 October 2011, Geneva), and was requested to provide feedback from the Committee to this event, if appropriate **(Recommendation)**.

5. STRATEGIC AND STRUCTURAL ISSUES FOR JCOMM-IV

5.1. JCOMM Structure and Related Management Issues

5.1.1. The Committee considered that the current structure and composition of the teams were generally appropriate to make progress in the implementation of the Commission’s intersessional work plan, therefore agreed that the current structure of the Commission should be proposed at JCOMM-IV to carry forward during the next intersessional period **(Decision)**. Regarding the Task Team on Satellite Data Requirements (TT-SAT), the Committee agreed that the TT-SAT that was established during the current intersessional period should replace the Activity Leaders on Satellite Data Requirements in each Programme Area, with the chair to represent the TT on the

Management Committee. Therefore the PA Coordinators and the chairs of Teams/Groups were requested to consider retaining their positions for the next intersessional period, and explore necessary procedures according to the national and WMO-IOC regulation **(Recommendation)**.

5.1.2. Taking into account the increasing requirements for the Expert Team on Waves and Storm Surges (ETWS) regarding its work for coastal hazards issues primarily associated with storm surges, the Committee suggested that the Team may be renamed as the Expert Team on Coastal Hazards Forecasting System (ETCH) in order to more accurately represent its interests, skills and deliverables while continuing to carry out its current work regarding the global coordination for waves and storm surges. The Committee requested the SCG to further discuss on this proposal at the planned SCG meeting (November 2011), and provide comments on the implication and any required changes in membership **(Action)**.

5.2. Personnel for next Intersessional Period

5.2.1. A number of issues were discussed, relating to the replacement of Dr Frolov, who had resigned as the ocean co-chair in June 2011, and to the rather long intersessional (six years) that would likely elapse between JCOMM-IV and V. Following the relevant IOC and WMO rules, an election by correspondence would be held for the ocean co-chair, requiring JCOMM members to nominate candidates and then to cast a single vote in favour of their preferred candidate. This process, requiring two successive mailings to WMO member states and IOC contact points, would inevitably take several months, and might not even be complete by JCOMM-IV. The Committee noted with concern that the election-by-correspondence procedure might be lengthy and that some details of the procedure had yet to be agreed by the WMO and IOC legal advisors. Nonetheless the Committee agreed that it was not in a position to suggest an alternative approach.

5.2.2. The Committee also noted that consistent with General Regulation 11 of the WMO the term of office of the Co-President for Meteorology, Dr Peter Dexter, and the co-president (Oceanography) if elected by correspondence prior to the Session, would terminate at the end of JCOMM-IV. Elections would be held for both Co-Presidents (for meteorology and oceanography) at the JCOMM-IV session. The Committee noted with interest a number of possible candidacies for these positions. It supported these possibilities “in principle”, while suggesting that additional possibilities might also be explored, and requested the co-president and Secretariat to pursue this important matter further as soon as possible, with a view to having good candidates clearly identified well in advance of the session.

5.2.3. Considering that the next intersessional period was likely to be longer than usual (around 5.5 years), the PA Coordinators were requested to set a plan to secure positions of vice-chair in each CG and explore suitable candidates, to ensure succession plans for key posts **(Action)**.

5.3. JCOMM Collaboration with IOC-WMO and External Programmes, Projects, and Regional Bodies

5.3.1. The Committee noted the ongoing collaboration with other WMO and IOC programmes (see MAN-IX/Doc 5.3).

5.3.2. Additionally, the Committee was informed of the newly established relationship between the GOOS Project Office and the GEO Ocean Observations Community of Practice (OO CoP). The OO CoP would have an initial focus on promoting collaborative action in the flow of data from the ocean observing system through data management systems to scientific and operational users. It included representatives of the JCOMM DMPA, IODE, and the ocean forecasting and reanalysis communities. Noting the aims of the CoP to be complementary to already existing bodies and structures, the Committee agreed that the CoP had identified a useful and non-duplicative niche for initial activities.

5.3.3. The Committee received a report by Dr Eric Lindstrom, co-chair of the post-OceanObs'09 working group, on the Framework for Ocean Observing that has inspired the reform of GOOS structures. The Committee noted that, although the Essential Ocean Variables (EOVs) in some cases may overlap with ECVs, they should represent societal needs for ocean parameters driven by high-level international conventions, for example, for biodiversity or sustainable development, taking into account a number of criteria used for ECVs or EOVs:

- they had to be important, with the measurement making a demonstrable impact,
- the measurement had to be feasible at global scale,
- and they should be cost-effective.

It was stressed that the Essential Climate Variable (ECV) or EOV language is the most useful in articulating observing plans at the highest level. Considerable technical details reside behind each one.

5.3.4. The Committee expressed their appreciation to Dr Lindstrom for his leadership to develop the Framework for Ocean Observing.

5.4. JCOMM Strategy and Operating Plan

5.4.1. The Committee recalled that the current version of this document is available at http://www.jcomm.info/Strategy. The Committee recognized that the JCOMM strategy would continue to be a dynamic document, and requested the Co-Presidents to work with a small group of Management Committee members to prepare an updated Strategy document, , restructured to focus on the vision, objectives and overall strategy for the Commission itself, within the broad context of the current priorities and Strategic Thrusts of WMO and IOC. The detailed mapping of JCOMM programme activities onto the Expected Results of both Organizations would then be included in an annex to the strategy. The Committee requested the group (co-president, PA Coordinators and Eric Lindstrom) to prepare a draft of the revised strategy document, for review and approval by the full Committee (by email) prior to inclusion of the document in the background documentation for JCOMM-IV, with the new Executive Summary to be translated for approval by the session **(Action)**.

6. LOGISTICAL PREPARATION FOR JCOMM-IV

6.1. Agenda, Annotated Agenda and Documentation Plan

6.1.1. The Committee reviewed and agreed on the proposed agenda, explanatory memorandum related to the provisional agenda, documentation plan and provisional list of Resolutions and Recommendations for JCOMM-IV, prepared by the WMO and IOC secretariats, as reproduced in *Annex IX* to *XII* **(Decision)**.

6.2. Structure of the JCOMM-IV Session

6.2.1. The Committee reviewed the structure of the JCOMM-IV session in terms of overall timing, and of some of the logistical preparations and overall preliminary budget estimate for the Session. The IOC Secretariat reported that the government of the Republic of Korea including the Korea Meteorological Administration (KMA) was supporting IOC to organize the Session, in financing and running the JCOMM-IV session with generous financial contributions that would allow IOC to uphold its commitment to run the session despite a lack of regular programme budget. However, the IOC Secretariat faced challenges regarding human resources to fully support the preparations for the session, of which some solutions such as secondment from a government (China) were being put into place.

6.2.2. The Committee was reminded that the session documents should be carefully drafted in a compact and precise way within the limit in length, taking into account the translation and interpretation for the intergovernmental discussion **(Action)**. Meanwhile, it took note of some concerns of the PA Coordinators on possible need for longer documents to address necessary issues. The Committee requested the Secretariats to explore whether additional resources could be provided for the expected additional cost for in-session translation for this purpose **(Action)**. The Committee adopted the JCOMM-IV documentation plan in *Annex XI* **(Decision)**.

6.2.3. The Committee decided to request Dr. Won-Tae Kwok (Korea) to give a keynote lecture as a part of or immediately following the formal opening of JCOMM-IV on Wednesday 23 May 2012 **(Action)**. The Committee further decided to ask Dr. Neville Smith (Australia) to give the George Needler memorial lecture, in recognition of their contribution to the development of operational oceanography **(Action)**.

6.2.4. The Committee discussed possible candidates for JCOMM Certificates of Outstanding Service. Three names were proposed during the discussion, and it was agreed that the issue would remain open for further proposals until the end of March 2012 **(Decision)**. The Secretariat was requested to finalise the certificates after that date, for presentation at the opening ceremony in Yeosu (**Action**).

Scientific and Technical Conference

6.2.5. The Committee discussed the topic of the Scientific and Technical workshop associated with JCOMM-IV, taking into account the comments received from Committee members and the host country before the meeting. The Committee recalled that the workshop had multiple purposes: to bring developing country participants as well as scientific and technical experts to the Commission Session to reinforce delegations and maintain links with JCOMM, and to contribute to the work of the commission through an opportunity for longer, more informal discussion.

6.2.6. The Committee agreed to the following title and outline for the workshop:

Theme: **Improving Marine and Ocean Data and Products for Science and Society: the role of JCOMM**

- Keynote(s) on benefits and impacts of ocean products and services (socio-economic impact)

1. Session: Reducing uncertainty in ocean data and products for seasonal prediction and regional sea level rise prediction
2. Session: Improved data accessibility and management as link between observations and services
3. Session: JCOMM products and services and user interfaces (regional focus)
4. Session: JCOMM contribution to climate services
    a. Conference statement adoption

- On Saturday for 1/2 day: a smaller group will review the JCOMM work programme in light of the workshop, including contribution to GFCS, potentially through breakout groups

6.2.7. The Committee decided that the speakers should be all invited speakers, and that contributions for posters should be solicited from a broad audience (**Decision**).

6.2.8. The Committee noted that Dr. Sung-Hyup YOU (KMA International Relations) was the Korean focal point for the organization of the workshop, and appointed David Meldrum as the Committee and Secretariat focal point for the moment. **(Action)**.

7. Any other business

7.1. No other business items were raised for consideration.

8. Closure of the Session

8.1. The Committee reviewed and approved the final report of the meeting and action items for the remaining intersessional period.

8.2. In closing the meeting, the JCOMM Co-President, Dr Peter Dexter thanked all participants for their contribution to the discussion, and hard work to achieve the Commission's goals. Dr Dexter noted that, although his term will end by the end of the JCOMM-IV session, he was willing to remain as a member of the Management Committee for the next intersessional period, if the Commission thought this appropriate. He also thanked the Secretariat for their exemplary work for the meeting, as well as ongoing support for JCOMM.

8.3. It was proposed, as for previous Commission sessions, to hold a short informal session of the Management Committee immediately after the JCOMM-IV session once the new Committee was established, and to hold the 10th Management Committee in early 2013 (tentatively the 1st week of February) in IOC, Paris, France.

8.4. The ninth session of the JCOMM Management Committee closed at 1700 on Friday, 16 September 2011.

Annex I

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Annex II

AGENDA

1. Organization of the Session

1.1 Opening
1.2 Adoption of the agenda
1.3 Working arrangements

2. Reports by Co-Presidents and Secretariats

3. Programme Preparation for JCOMM-IV

3.1 Guidance and Requirements from WMO-IOC Governing Bodies
3.2 Programme Areas: Deliverables, Recommendations and Future Actions
3.3 Cross-Cutting Activities within JCOMM

4. JCOMM Deliverables and Recommendations associated with Collaborative Programmes, Projects and Activities

4.1 Participation in and Collaboration with WMO Integrated Global Observing System (WIGOS), WMO Information System (WIS) and IOC/IODE Ocean Data Portal (ODP)
4.2 Maritime Safety Services
4.3 Marine and Coastal Hazards
4.4 Global Framework for Climate Services (GFCS)
4.5 Deliverables and Recommendations for Scientific and Technical Development
4.6 Support for Technology Transfer and Capacity Development

5. Strategic and Structural Issues for JCOMM-IV

5.1 JCOMM Structure and related management issues
5.2 Personnel for next intersessional period
5.3 JCOMM Collaboration with IOC-WMO and External Programmes, Projects, and Regional Bodies
5.4 JCOMM Strategy and Operating Plan

6. Logistical preparation for JCOMM-IV

6.1 Agenda, Annotated Agenda and Documentation Plan
6.2 Structure of the JCOMM-IV Session

7. Any other business

8. Closure of the Session

Annex III

STATUS OF JCOMM WORKPLAN 2010-2013 (decided at JCOMM-III)
As of November 2010

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Organizational				
Para 5.2.4	Coordinate the implementation of any actions referred to JCOMM by the OceanObs'09 and the post-conference Working Group on the integration of the ocean observing system	Management Committee, relevant Programme Areas	Ongoing	Ongoing (MAN-IX, item 3.2.1 & 5.3)
Para 6.1.17 & 6.1.19	Liaise with the WMO Space Programme and address the UNESCO/IOC Strategy for the use of Remote Sensing in oceanography, and other international groups dealing with satellite issues	Observations, Data Management, and Services and Forecasting Systems Programme Area	Ongoing	Partly Done (MAN-IX, item 3.2 & 4.3)
Para 6.2.3 & Recommendation 1 (JCOMM-III)	Establish a network of Regional Marine Instrument Centres (RMIC) and a mechanism for the formal WMO and UNESCO/IOC designation of a RMIC	Observations Programme Area and Management Committee	Continuing	Implemented (MAN-IX, item 4.1)
Para 6.3.6	Review new observing technology developments and liaise with relevant coordination groups with a view to incorporating them in the work programme	Observations Programme Area and Management Committee	Continuing	Initiated &Implemented (MAN-IXI, item 3.2.1 & 4.5)
Para 6.4.3	Expand the activities of the JCOMMOPS	Observations Programme Area and Management Committee	Before JCOMM-IV	Pending (MAN-IX, item 3.2.1)
Para 8.2.1	Assess and categorize Members/Member States needs to facilitate their inclusion in its capacity building work programmes	Co-presidents and Management Committee	Before JCOMM-IV	Pending (MAN-IX, item 4.6)
Para 9.1.3 & 9.1.8	Keep the JCOMM Capacity Building principles under review and revise the JCOMM Capacity Building strategy	Activity leader on Capacity Building, Management Committee	ASAP	Pending (MAN-IX, item 4.6)
Para 9.1.6	Develop an expanded partnership with COMET	Management Committee	ASAP	Pending (MAN-IX, item 4.6)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 9.2.2	Develop a mechanism to further interact with the WMO Regional Associations and GOOS Regional Alliances (GRAs)	Management Committee	ASAP	Pending (MAN-IX, item 5.3)
Para 11.0.1 & 11.2.1	Develop a framework to address quality management aspects in the overall context of developing standards and recommended practices on met-ocean data acquisition and delivery of services and products, and establish a policy for the systematic review of relevant publications	Management Committee	Intersessional period	Ongoing (MAN-IX, item 3.3)
Para 13.1.4	Maintain oversight on DRR-related activities	Management Committee, Services and Forecasting Systems Programme Ares	Intersessional period	Ongoing (MAN-IX, item 4.3)
Para 13.1.6	Consider the possible recognition of a role of a specialized regional centre might have in the cascading forecasting process for the marine forecasting services aspects, and specify the criteria for the designation of a RSMC with activity specialization in marine meteorology, to be included in the GDPFS	Co-presidents and Management Committee, in collaboration with CBS/GDPFS	Intersessional period	Pending (MAN-IX, item 5.3 & 6.1)
Para 13.1.7 & 13.1.9	Facilitate and strengthen relationships with WMO Technical Commissions and UNESCO/IOC programmes, taking into account relevant JCOMM team activities and pilot projects	Co-presidents and Management Committee	Intersessional period	Ongoing (MAN-IX, item 5.3)
Para 13.1.8	Study the possibility to implement the ocean and marine meteorological services via the WMO Regional Climate Centres	Management Committee	Intersessional period	Pending (MAN-IX, item 5.3)
Para 13.1.11 & 13.1.12	Collaborate with TOWS-WG wherever possible to the enhancement of TWS as a component of a coordinated and comprehensive marine hazards warning system and keep Members/Member States informed on the progress	Management Committee	Intersessional period	Ongoing (MAN-IX, item 4.3&5.3)
Para 13.1.30	Consult with WCRP on the themes and modalities for a stronger cooperation with a focus on activities that contribute to the implementation of main outcomes of WCC-3 and OceanObs'09	Management Committee	Intersessional period	Ongoing (MAN-IX, item 4.3&5.3)
Para 13.1.32	Take the lead in implementing the actions to secure the IPY marine observing systems legacy as a contribution to WIGOS development	Management Committee	Intersessional period	Ongoing (MAN-IX, item 4.1)
Para 13.2.2	Review progress and activities associated with the UN Conventions and take actions as appropriate	Management Committee and Secretariats	Continuing	Pending (MAN-IX, item 5.3)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 13.2.5	Establish and improve collaboration with organizations and institutions, including aid agencies, to leverage opportunities for enhancing observing systems and services capabilities in the developing world, particularly in coastal areas	Management Committee	Continuing	Ongoing (MAN-IX, item 4.3)
Para 13.2.6 & 13.2.7	Maintain oversight on WMO and UNESCO/IOC marine-related activities in GEO and activities related to satellite systems for ocean observations	Management Committee	Continuing	Pending (MAN-IX, item 3.3)
Para 13.2.8	Develop an approach for contributing to WMO and UNESCO/IOC activities towards enhanced collaboration with private sector	Management Committee, in collaboration with CBS OPAG on PWS and GSSC	Intersessional period	Pending (MAN-IX, item 5.3)
Para 14.1.2	Finalize the JCOMM Strategy document 2010-2013	Co-presidents and Management Committee	ASAP	Ongoing (MAN-IX, item 5.4)
Para 14.1.3	Seek for external funding for the implementation of the JCOMM work programme	Co-presidents, Management Committee and Secretariats, in collaboration with potential donors and stakeholders	Continuing	Ongoing (MAN-IX, item 2, 5.4)
Para 8.3.14	Maintain oversight on WCC-3's follow-up activities, with a view to determining JCOMM's contribution to the GFCS and to include it in its work programme, when required	Management Committee	Ongoing	Ongoing (MAN-IX, item 4.4)
Observations				
Para 5.1.2	Address the met-ocean observational data requirements as part of the work programmes, in coordination with CBS as appropriate	Observations and Data Management Programme Areas	Ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.1	Continue to work towards ECV-based metrics and keep the OPA implementation goals document under review and up-to-date	Observations Coordination Group	Ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.1	Develop the OPA work programme according to the need to enhance the partnerships between research institutes and operational services	Observations Coordination Group	ASAP	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.4	Propose a strategy for the OPA to enhance deployment opportunities	Observations Coordination Group	ASAP	Pending (MAN-IX, item 3.2.1)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 6.1.5	Find a funding mechanism by which JCOMMOPS can partner with other agencies (e.g. space agencies) for the benefit of JCOMM	Observations Coordination Group	ASAP	Pending (MAN-IX, item 3.2.1)
Para 6.1.6	Complete the oceanographer's and marine meteorologist's cookbook for submitting data in real time and in deployed mode	Observations Coordination Group	By JCOMM-IV	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.9	Translate the outcome and recommendations of OceanObs'09 into an updated version of the JCOMM OPA implementation goals	Observations Programme Area	ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.10	Consider coastal requirements in the OPA work programme, taking into account the need of developing/least developed coastal countries	Observations Programme Area	ongoingASAP	Pending (MAN-IX, item 3.2.1)
Para 6.1.11.4	Secure the support necessary to maintain, and if possible, expand the existing VOS fleet	Observations Coordination Group, Ship Observations Team and OOPC	Ongoing	workshop planned (MAN-IX, item 3.2.1)
Para 6.1.11.5	Coordinate the development of a universally accepted solution for the ship call-sign masking for consideration by the WMO Executive Council	Ship Observations Team	ASAP	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.11.7	Further develop the guidelines on standards for instruments and high quality best practices for the Voluntary Observing Fleet and publish them as a JCOMM Technical Report	Ship Observations Team	ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.11.7	Document VOS best practices to include the ocean variables managed under the SOT Ship Of Opportunity Implementation Panel (SOOPIP)	Ship Observations Team	ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.11.10	Evaluate the technical implications related to the compatibility between AIS equipments and observation stations	Ship Observations Team	Ongoing	working group established (MAN-IX, item 3.2.1)
Para 6.1.12.1	Assist the Argo programme in deploying floats to achieve and maintain the array's design requirements	Observations Coordination Group, Data Buoy Cooperation Panel and Ship Observations Team	Ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.13 & 6.1.14	Continue to be involved in the developments of observing systems in Polar Regions	Observations Programme Area	Ongoing	Ongoing (MAN-IX, item 3.2.1)
Para 6.1.16	Add wave observations as a key variable to be derived from satellite observations	Observations Coordination Group	ASAP	Ongoing (MAN-IX, item 3.2.1)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 6.1.20	Produce a document that provides an integrated (space and *in situ*) observing strategy for a number of geophysical variables	Observations Coordination Group, in consultation with Data Management, and Services and Forecasting Systems Programme Areas	ASAP	Pending (MAN-IX, item 3.2.1)
Para 6.1.21	Coordinate the collection of information on satellite data requirements and planning, and make it available via the JCOMMOPS website	JCOMMOPS	ASAP	Pending (MAN-IX, item 3.2.1)
Para 6.2.1, 6.2.7 & 12.7	Update the content of relevant publications taking into account the increasing need to enhance the quality of data through appropriate standards in order to address the climate requirements	Observations Programme Area	Intersessional period	Ongoing (MAN-IX, item 3.2.1)
Para 6.2.2	Develop high quality best practices for the Voluntary Observing Fleet with the goal of publishing them as a JCOMM Technical Report	Ship Observations Team	Intersessional period	ongoing (MAN-IX, item 3.2.1)
Para 6.2.2	Identify ways for enhance JCOMM linkage with manufacturers	Observations Programme Area and its Panels and Groups	Continuing	Ongoing (MAN-IX, item 3.2.1)
Para 6.3.3	Compile and synthesize activities related to satellite data telecommunication systems and data collection options under all programmes and panels of OPA	Observations Coordination Group	Intersessional period	Ongoing (MAN-IX, item 3.2.1)
Para 6.5.1	Implement the priority activities for the OPA defined by the Commission	Observations Programme Area	Intersessional period	Ongoing (MAN-IX, item 3.2.1)
Para 8.2.6	Continue supporting activities for extending the network of sea level measuring gauges, as well as increasing the number of those reporting in real-time, and other sea-level observing techniques	GLOSS Group of Experts	Continuing	Ongoing (MAN-IX, item 3.2.1)
Para 13.1.16	Take the appropriate steps, including establishing partnerships between ocean research and operational communities, to facilitate the implementation of the actions to improve ocean observing systems arose from the Progress Report on the implementation of GCOS in support of the UNFCCC 2004-2008	Observations Programme Area	Intersessional period	Ongoing (MAN-IX, item 3.2.1)
Data Management				
Para 7.1.1	Routinely review and update the Data Management Plan	Data Management Coordination Group	Intersessional period	Ongoing (MAN-IX, item 3.2.3)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 7.1.2 & 7.3.1	Continue and further strengthen the collaboration with the IODE of UNESCO/IOC based upon complementarities of strengths and expertise	Data Management Programme Area	Continuing	Ongoing (MAN-IX, item 3.2.3)
Para 7.1.3	Develop an appropriate documentation that describes the template for the Marine Community Profile	Data Management Programme Area	ASAP	Ongoing (MAN-IX, item 3.2.3)
Para 7.2.1	Review if the accuracy of the GPS position and time is being reported in coded and climate reports	Expert Team on Marine Climatology, Ship Observations Team and Task Team on Table Driven Codes	Intersessional period	Ongoing (MAN-IX, item 3.2.3)
Para 7.2.2	Organize CLIMAR-IV and MARCDAT-III	Expert Team on Marine Climatology	Intersessional period	Done (MAN-IX, item 3.2.3)
Para 7.2.3	Modernize the Marine Climatological Summaries Scheme	Expert Team on Marine Climatology	Intersessional period	Ongoing (MAN-IX, item 3.2.3)
Para 7.2.5	Decide how the manual observations on “rigs and platforms” should be preserved and archived	Expert Team on Marine Climatology, Ship Observations Team	Intersessional period	Ongoing (MAN-IX, item 3.2.3)
Para 7.4.1	Implement the priority activities for the DMPA defined by the Commission	Data Management Programme Area	Intersessional period	Ongoing (MAN-IX, item 3.2.3)
Para 10.1.2	Contribute to the development of a WIS data representation system policy	Data Management Coordination Group	Continuing	Ongoing (MAN-IX, item 3.2.3)
Para 10.1.5	Assist Members/Member States in the WIS centre designation process	Data Management Coordination Group	Ongoing	Ongoing (MAN-IX, item 3.2.3)
Para 11.2.2 & Recommendation 4 (JCOMM-III)	Identify the standards that are widely applicable by the marine meteorological and oceanographic communities for inclusion in the WMO and UNESCO/IOC publications and/or submission to appropriate standards bodies such as ISO	JCOMM-IODE Expert Team on Data Management Practices	Intersessional period	Ongoing (MAN-IX, item 3.2.3)
Para 13.1.34	Assist the WMO EC-PORS in facilitating acquisition, exchange and archiving of observational data from Polar Regions	Data Management Programme Area	Intersessional period	Ongoing (MAN-IX, item 3.2.3)
Services and Forecasting Systems				

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 5.0.1 & 5.1.2	Regularly review of the observational data requirements for met-ocean applications, where feasible through Observing System Experiments, Observing System Simulation Experiments and various test-beds for the verification of impacts in a range of application areas	Services and Forecasting Systems Programme Area	Ongoing	Ongoing (MAN-IX, item 3.2.2)
Para 5.21.2	Participate in the WMO/CBS Rolling Review of Requirements and update the Statement of Guidance for Met-ocean Applications	Services and Forecasting Systems Programme Area and JCOMMOPS	Ongoing	Ongoing (MAN-IX, item 3.2.2)
Para 8.1.2, 8.1.3 & Recommendation 5 (JCOMM-III)	Assist in and guide the transition of ocean forecasting systems from research to operations, and develop a JCOMM Guide to Operational Ocean Forecasting Systems	Expert Team on Operational Ocean Forecasting Systems	Continuing	Ongoing (MAN-IX, item 3.2.2)
Para 8.1.3	Keep under review the ocean observational requirements for operational ocean forecasting systems and ensure that interoperable standards and best practices are developed	Expert Team on Operational Ocean Forecasting Systems; Services and Forecasting Systems, Observations and Data Management Programme Areas	Continuing	Ongoing (MAN-IX, item 3.2.2)
Para 8.1.5	Expand the wave forecast verification scheme	Expert Team on Wind Waves and Storm Surges	Continuing	Ongoing (MAN-IX, item 3.2.2)
Para 8.1.6	Address the establishment of a network of moored wave measuring buoys to cover sparse ocean areas where storms are generated and propagated	Expert Team on Wind Waves and Storm Surges, Data Buoy Cooperation Panel	Ongoing	Ongoing (MAN-IX, item 3.2.2)
Para 8.1.7 & 8.2.1	Continue to co-sponsor and co-organize: (a) International Workshops on Wave Analysis and Forecasting and Coastal Hazard Symposia; (b) Scientific and Technical Symposium on Storm Surge; and (c) training workshops on storm surge and wave forecasting	Expert Team on Wind Waves and Storm Surges	Intersessional period	Done (MAN-IX, item 3.2.2, 4.3, 4.6)
Para 8.1.9	Promote the implementation of operational specialized numerical prediction systems on wave and storm surge, and the use of probabilistic prediction products	Expert Team on Wind Waves and Storm Surges	Ongoing	Ongoing (MAN-IX, item 3.2.2, 4.3)
Para 8.1.11	Review the existing guides and manuals, and continue to develop technical guidance material on wave and storm surge forecasting	Expert Team on Wind Waves and Storm Surges	Continuing	Ongoing (MAN-IX, item 3.2.2, 4.6)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 8.2.3 & 8.2.4, & Recommendation 6 (JCOMM-III)	Provide technical advice, guidance and coordination in the development of Demonstration Projects for building integrated global and regional storm surge watch schemes within a multi-hazard framework	Expert Team on Wind Waves and Storm Surges	Intersessional period	Ongoing (MAN-IX, item 3.2.2, 4.3)
Para 8.2.5	Continue to develop regional and global wave and storm surge climatologies as a measure of risk assessment for marine hazards and assist Members/Member States in developing their own databases and hazard analysis	Expert Team on Wind Waves and Storm Surges	Intersessional period	Ongoing (MAN-IX, item 3.2.2, 4.3)
Para 8.2.7 & 13.1.5	Assist in the implementation of the marine component of the SWFDP and use the concept to further develop and implement marine forecasting products and services in regions subject to marine hazards	Expert Team on Wind Waves and Storm Surges	Intersessional period	Ongoing (MAN-IX, item 3.2.2, 4.3)
Para 8.2.9	Consider ocean forecasting systems in support of marine pollution monitoring and response, and maritime search and rescue, in ETOOFS workplan	Expert Team on Operational Ocean Forecasting Systems	Intersessional period	Ongoing (MAN-IX, item 3.2.2, 4.2)
Para 8.2.9	Monitor implementation and operations of the Marine Pollution Emergency Response Support System (MPERSS) and assist Members/Member States in implementing their services in support of marine accident emergencies	Expert Team on Maritime Safety Services	Continuing	Ongoing (MAN-IX, item 3.2.2, 4.2)
Para 8.2.12	Establish collaborating arrangements with the CBS Coordination Group on Nuclear Emergency Response Activities to address common issues related to environmental emergencies	Services and Forecasting Systems Programme Area	ASAP	Ongoing (MAN-IX, item 3.2.2, 4.2)
Para 8.3.2 & 8.3.13	Develop product specification for met-ocean variables, in accordance with IHO standards	Expert Team on Maritime Safety Services, Expert Team on Sea Ice, in consultation with IMO and IHO	Intersessional period	Ongoing (MAN-IX, item 3.2.2, 4.2)
Para 8.3.3 & 11.1.2 & Recommendations 7 (JCOMM-III) & 8 (JCOMM-III)	Organize a training workshop on maritime safety services, focused on Quality Management Systems for the provision of met-ocean services for international maritime navigation	Expert Team on Maritime Safety Services, and WMO Secretariat	Intersessional period	Done (MAN-IX, item 3.2.2, 5.2)
Para 8.3.4	Assist the METAREA Issuing Services concerned in implementing their operating plans for the provision of marine meteorological and oceanographic services for the Arctic Region	Expert Team on Maritime Safety Services	Before 2011	Done (MAN-IX, item 3.2.2, 5.2)

Reference (JCOMM-III report)	*Task*	*By whom*	*Target*	*Status / reference*
Para 8.3.6	Develop proposals for inclusion of information on complex sea states in weather and sea bulletins	Expert Team on Maritime Safety Services, Expert Team on Wind Waves and Storm Surges	Intersessional period	Ongoing (MAN-IX, item 3.2.2, 5.2)
Para 8.3.7	Propose sea ice specifications for Maritime Safety Information to be disseminated via SafetyNET and international NAVTEX services	Expert Team on Sea Ice, Expert Team on Maritime Safety Services	Intersessional period	Done (MAN-IX, item 3.2.2, 5.2)
Para 8.3.9 & 9.1.4	Continue to co-sponsor and co-organize Ice Analysts Workshops	Expert Team on Sea Ice	Intersessional period	Done (MAN-IX, item 3.2.2)
Para 8.3.10	Keep under review requirements for sea ice observations and services	Expert Team on Sea Ice	Intersessional period	Ongoing (MAN-IX, item 3.2.2)
Para 8.3.11	Contribute to the development of coupled sea ice-ocean-atmosphere numerical models and sea ice forecasting and data assimilation techniques	Expert Team on Sea Ice, Expert Team on Operational Ocean Forecasting Systems	Intersessional period	Ongoing (MAN-IX, item 3.2.2)
Para 8.3.12	Review the GDSIDB and provide guidance to Members/Member States submitting data to this database	Expert Team on Sea Ice	Continuing	Done (MAN-IX, item 3.2.2)
Para 8.4.1	Implement the priority activities for the SFSPA defined by the Commission	Services and Forecasting Systems Programme Area	Intersessional period	Ongoing (MAN-IX, item 3.2.2)
Para 13.1.3	Develop technical guidance material on standard methodologies for monitoring, archiving, analysis and mapping of marine-related hazards	Expert Team on Marine Climatology, Expert Team on Wind Waves and Storm Surges	Intersessional period	Ongoing (MAN-IX, item 3.2.2)

Annex IV

OUTLINE OF THE PROGRAMME AREA REPORTS REVISED JCOMM-IV

OPA report to JCOMM-IV

1. JCOMM-III priority activities for the Observations Programme Area, in no particular order:

(i) Completion and sustainability of the initial observing system (target 100 per cent completion), and updating of the OPA implementations goals to take into account input from OceanObs'09 conference (Venice, Italy, September 2009);

(ii) Integration in the WMO Integrated Global Observing System (WIGOS), including the review and update of appropriate WMO and UNESCO/IOC Technical Publications (4 WMO Publications, and 2 UNESCO/IOC Publications), and the establishment of Regional Marine Instrument Centres (RMIC) in the regions (target 6 regions);

(iii) Enhancement of *in situ* global wave observing capability and quality in support of satellite products and ocean models through evaluation of wave measurements, and development of new cost-effective technology (target improved quality, and new technology available);

(iv) Increased use of high data rate satellite data telecommunication (target relevant platforms using high data rate);

(v) Implementation of the Partnership for New GEOSS Applications Concept (PANGEA) – i.e. developing partnership with developing countries regarding the use of ocean observations and products, and their participation in the maintenance of the observing networks (target 1 workshop per year);

(vi) Exploration of mechanisms, including funding, by which JCOMMOPS can partner with other agencies (e.g. space agencies) and programmes for the benefit of JCOMM (target new funding and expanded JCOMMOPS);

(vii) Coordinate with DMCG the completion of the JCOMM Cookbook for the submission of ocean data in real time and delayed mode (target: cookbook completed and published as a JCOMM Technical Report).

2. Achievement/Progress during the current inter-sessional period (2009 – 2012)

1) Brief description in main document

2) Implementation status of each observing network in main document and cross-cutting issues, including JCOMMOPS and system-wide integration, as background document (English only):

   a) GLOSS, DBCP, SOT – JCOMM programs

   b) Argo, OceanSITES, IOCCP/GO-SHIP - programs participating in work of JCOMM Observations Coordination Group

   c) JCOMMOPS and system-wide technical integration

d) Performance metrics and tracking

e) Issues with impacts across *in situ* observing platforms (e.g., pilots for new technology, strategies for coverage of chronically under sampled parts of the ocean, capacity building)

f) Standards and best practices

3. Priorities for JCOMM-IV:

(i) reiteration of the combined observing requirements for climate monitoring, research and services (e.g., GFCS); and non-climate requirements expressed through the WMO Rolling Review of Requirements (RRR); and particularly marine hazard-related services; considering both satellite and *in situ* capabilities, and remaining open to requirements for coastal observations

(ii) encourage diversification of national and agency contributions to observing networks (more countries, research and operational agencies)

(iii) encourage diversification of national and agency contributions to JCOMMOPS (ship providers, increased cross-funding across satellite and *in situ* agencies)

(iv) assist in the implementation of the legacy recommendations of the JCOMM Pilot Project for WIGOS. In particular, encourage JCOMM members to offer new RMIC facilities (particularly in RA-III, RA-V, RA-VI).

(v) endorsement of OCG work plan

4. OPA work plan for next intersessional period (2012-2017). The work plan will focus on:

(i) Improved synergies and integrated action amongst observing networks, including JCOMMOPS

(ii) Work on data system issues, including: documenting the institutional arrangements for each network for the real-time and delayed-mode data streams to advance seamless delivery of integrated and consistent, climate-quality delivery of climate observations. Action to improve access to real-time ocean observations. Tracking/oversight by OCG and JCOMMOPS/OSMC.

(iii) Documentation of best practices

(iv) Capacity Building

5. Opportunities…….

SFSPA report to JCOMM-IV

1. Overview

JCOMM-III established three major thrust areas for the SFSPA:

a) Ensure maritime weather and sea ice safety
b) Implement operational ocean forecasting capability
c) Reduce risks of weather hazards on coastal community (waves, storm surges)

SFSPA identified a number of priority projects aimed at achieving outcomes by JCOMM-IV. These projects are led by SFSPA Expert Teams.

2. Achievements/Progress during the current inter-sessional period (2009-2012)

i) Maritime Safety

i) Implement GMDSS in Arctic Ocean

Status: Significant progress. Complete for METAREAS XVII-XXI (within Inmarsat coverage zone); extension of bi-polar GMDSS for all ice-covered METAREAS is a high priority for next intersessional period

ii) Developing MPERSS in Arctic Ocean

Status: ongoing on a level of national services and international projects

iii) Implement QMS framework

Status: complete.

iv) Update sea ice standard

Status: Ongoing, testing and gradual implementation of updates (ETSI-IV and IAW-3) to WMO Sea Ice Nomenclature Vol 1-2 and SIGRID3; final NAVTEX sea ice abbreviations complete

v) Integrated met-ocean product suites for the Arctic Ocean

Status: Ongoing (Initial Operating Capability achieved)

vi) Update WMO 471 and 558 for sea state in MSI

Status: ongoing (next step: A white paper on including hazardous Seas info. in GMDSS)

vii) Catalogue on met-ocean object class for ENC

Status: JCOMM-4

viii) Ice information in ENCs

Status: Progressing, currently in stage of implementation of Ice Objects Catalogue ver.5.0.1 and presentation library add-ons, demonstration at JCOMM-4

ix) GMDSS website

Status: ongoing (significant progress made)
Dedicated Arctic METAREAS GMDSS web-site launched in June 2011

x) Updating user requirements for marine wx forecasting
Status: to be completed by JCOMM-4

xi) Wave forecast verification
Status: Complete.

xii) PP-WET/PP-WMD
Status: PP-WED: near completion; PP-WMD: removal/JCOMM-4

ii) Operational Ocean Forecasting

i) The Guide (#1, Gary)
Status: Initial draft by JCOMM-4

ii) Performance monitoring (#3, Gary)
Status: ongoing among operational centers

iii) Ocean data management (#6, Gary)
Status:

iv) Updating user requirements for ocean forecasting service (#4b, Gary)
Status:

iii) Support climate service – coastal hazard disaster risks reduction

i) Extreme wave database
Status: ETWS support

ii) Storm surge climatology
Status: removal

iii) Implementing JCOMM Storm Surge Symposium recommendations
Status: ongoing, significant progress, complete by JCOMM-4

iv) UNESCO pilot project on coastal hazard forecasting
Status: Ongoing, significant progress, high priority for next intersessional period

v) Develop and update guidance documents
Status: ongoing/JCOMM-4

vi) Global sea ice digital databank
Status: ongoing: sea ice normals update up to 2011, significant progress in harmonization of vector SIGRID3 for current collections across the ice services its implementation for historical collection backward in time.

iv) Requirements for oceanographic and marine meteorological observations
i) Ocean observation requirements
Status: complete (update to RRR)

ii) WMO RRR and lessons learned (Ali)
Status: Complete.

v) Capacity Building
i) GODAE summer school on operational ocean forecasting (1/2010)
ii) Sea Ice analysis training (COMET modules, IAW workshop, Copenhagen, 6/2011)
iii) Application of satellite obs for marine forecasting (Oostende, 12/2009)
iv) Wave forecasting training (Hyderabad, 1/2010)
v) Marine forecasting training (Dakar, 7/2010)
vi) N. Indian Ocean storm surge workshop (2/2011)

3. Programmatic Priorities and Opportunities for the upcoming inter-sessional period (2012-2017)

I. Marine volcanic ashfall hazard (Maritime Safety)

II. Severe Space Weather events (Maritime Safety)

III. Oceanic “dispersion modelling” for tracking/forecasting of radioactive materials and severe oil spells, and their potential impacts on marine life, coastal and marine ecosystems, and human health
a. Mimics the WMO “specialized regional center” concept for weather events. Proposal to leverage on centers w/ operational ocean forecasting capability toward establishing “specialized oceanic response centers” (Gary, ETOOFS)
b. Task GODAE OceanView Science Team on developing ocean modelling capability for “dispersion modelling” and future biological and ecological impact assessment capability (GOVST)

IV. ENC/ECDIS display capability for sea-ice, remotely-sensed imagery, marine weather and ocean forecast information in the new IHO S-1xx

V. Supporting GFCS – A focus on coastal hazards (e.g., storm surge, inundation)

VI. Supporting efficiency and safety of ice navigation: focuses on comprehensive ice services and implementation of sea-ice GMDSS in all ice-covered METAREAS (sub-Arctic and Antarctic)

DMPA report to JCOMM-IV

1. JCOMM-III priority activities for the Data Management Programme Area:

(i) Develop standards/best practices in the marine community through the IODE-JCOMM Standards Process;

(ii) Continue to work under the JCOMM Pilot Project for WIGOS to make the ODP and WIS interoperable as well as other ocean data systems interoperable with ODP and/or WIS;

(iii) Upgrade present BUFR encoding for marine variables to include instrument/platform metadata;

(iv) Complete Meta-T and Ocean Data Acquisition System (ODAS) implementation and capture of instrument/platform metadata;

(v) Modernize the Marine Climatological Summaries Scheme (MCSS);

(vi) Review and update the Data Management Plan;

(vii) Update the Catalogue of Standards and Best Practices and contribute to the implementation of Quality Management System (QMS) in compliance with the WMO Quality Management Framework (QMF);

(viii) Review and update the DMPA website;

(ix) Organization of the third International workshop on Advances in the Use of Historical Marine Climate Data (MARCDAT-III) and fourth JCOMM Workshops on Advances in Marine Climatology (CLIMAR-IV)

2. Achievement/Progress during the current inter-sessional period (2009 – 2012)

(i) Contributed to the improvement of standardization for ocean data management (IODE/ODS)

(ii) Supported WIGOS by developing ODP and contributing to making ODP and WIS interoperable as well as other ocean data systems interoperable with ODP and/or WIS.

(iii) Supported WIS by updating manuals (GTSPP manual), updating the data management plan, finalizing the data cookbook

(iv) Contributing to the development of a global integrated observing system by making steps towards an integrated *in situ*/satellite data management system

(v) Improved the instrument metadata management by updating the Table Driven Codes

(vi) new Vision & Strategy for a modern Marine Climate Data System which will address GFCS requirements

(vii) …

3. Activities for the remaining inter-sessional period (2009 – 2012)

(i) IODE/ODP V2 demonstration to JCOMM-IV

(ii) Finalization of the Oceanographer's and marine meteorologist's cookbook for submitting data in real time and in deployed mode; update the Data Management Plan (and keeping it up-to-date) in support of the WMO Information System (WIS)

(iii) Recommendations for improving the integration and comparison of satellite and *in situ* data (climatic/non-climatic requirements for *in situ* and satellite data, format interoperability and data homogenization issues)

(iv) Finalizing testing of the new BUFR templates and master table-10

(v) Workshop to discuss the vision for a new MCDS in the next 10 years to better address the requirements of the GCOS and GFCS, 28 Dec.-2 Nov, 2011, Hamburg, Germany

(vi) …

4. DMPA priorities for the next intersession period (2012-2017)

(i) Updating existing standards/best practices and continue to develop new ones (for data collection, methods of observations, quality control, metadata discovery, data exchange and archive) in the marine community through the IODE-JCOMM Standards Process in support of the Global Framework for Climate Services and WIGOS implementation;

(ii) Linkage of ODP with other data system (eg. SeaDataNet, IMOS, OBIS) and making them interoperable with the WIS

(iii) Implement the new JCOMM Marine Climate Data System (MCDS)

(iv) Improve the management of instrument/platform metadata

(v) Organization of the fourth JCOMM Workshops on Advances in Marine Climatology (CLIMAR-IV), possibly in 2013

(vi) ….

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Annex V

GAP ANALYSIS FINDINGS

Gap Analysis Findings: (Insert Section/Region here)	
QMS:	
Scope of Gap Analysis: (Area Being Analysed)	
Gap Analysis Date:	
Gap Analysis Completion Date:	
Gap Analysis Conducted by:	

Note: The Gap Analysis Findings list the Remedial Actions that are recommended to taken (where possible) the identified gaps that exist between the ISO 9001:2008 Standard and your current management system. Note that Remedial Actions are cross referenced to the corresponding ISO Clause and Gap Analysis Questions (Q ref No). A responsible officer has been assigned to each Remedial Action to ensure that the action is carried out. As actions are performed and gaps are filled, record the date the gap was filled to indicate completion. The review date for Remedial Actions is (insert date here).

Standard Clause (ISO 9001:2008 Reference)	Gap Identified	Proposed Remedial Action	Officer Responsible	Gap Filled Date
1 Scope				
1.1 General				
1.2 Application				
2 Normative references				
3 Terms and definitions				
4 Quality Management System				
4.1 General requirements				
4.2 Documentation Requirements				
4.2.1 General				
4.2.2 Quality manual				
4.2.3 Control of documents				
4.2.4 Control of records				
5 Management Responsibility				
5.1 Management commitment				
5.2 Customer focus				
5.3 Quality policy				
5.4 Planning				
5.4.1 Quality objectives				
5.4.2 Quality management system planning				
5.5 Responsibility, authority and communication				
5.5.1 Responsibility and authority				
5.5.2 Management representative				

Standard Clause (ISO 9001:2008 Reference)	Gap Identified	Proposed Remedial Action	Officer Responsible	Gap Filled Date
5.5.3 Internal communication				
5.6 Management review				
5.6.1 General				
5.6.2 Review input				
5.6.3 Review output				
6 Resource Management				
6.1 Provision of resources				
6.2 Human Resources				
6.2.1 General				
6.6.2 Competence, training and awareness				
6.3 Infrastructure				
6.4 Work environment				
7 Product Realization				
7.1 Planning of product realization				
7.2 Customer-related processes				
7.2.1 Determination of requirements related to the product				
7.2.2 Review of requirements related to the product				
7.2.3 Customer communication				
7.3 Design and development				
7.3.1 Design and development planning				
7.3.2 Design and development inputs				
7.3.3 Design and development outputs				
7.3.4 Design and development review				
7.3.5 Design and development verification				
7.3.6 Design and development validation				
7.4 Purchasing				
7.4.1 Purchasing process				
7.4.2 Purchasing information				
7.4.3 Verification of purchased product				
Production and service provision				

Standard Clause (ISO 9001:2008 Reference)	Gap Identified	Proposed Remedial Action	Officer Responsible	Gap Filled Date
7.5.1 Control of production and service provision				
7.5.2 Validation of processes for production and service provision				
7.5.3 Identification and traceability				
7.5.4 Customer property				
7.5.5 Preservation of product				
7.6 Control of monitoring and measuring equipment				
8 Measurement, Analysis and Improvement				
8.1 General				
8.2 Monitoring and measurement				
8.2.1 Customer satisfaction				
8.2.2 Internal audit				
8.2.3 Monitoring and measurement of processes				
8.2.4 Monitoring and measurement of product				
8.3 Control of nonconforming product				
8.4 Analysis of data				
8.5 Improvement				
8.5.1 Continual improvement				
8.5.2 Corrective action				
8.5.3 Preventive action				

Annex VI

PROPOSED OUTLINE FOR
A STRATEGY FOR THE JCOMM ACTIVITIES ON THE MARINE ACCIDENT EMERGENCY

1 Background

1.1 Consideration on JCOMM"s role within the global/international framework:

- International Convention for the Prevention of Pollution from Ships (MARPOL)
- Interaction/cooperation with the International Maritime Organization (IMO) Marine Environment Protection and Maritime Safety Committees (MEPC and MSC)
- Interaction/cooperation with the International Atomic Energy Agency, particularly with its Marine Environmental Studies Laboratory (MESL)
- European Maritime Safety Agency (EMSA)
- …

1.2 JCOMM activities and roles within WMO-IOC framework

- WMO Emergency Response Activities (ERA) Programme / CBS Coordination Group on Nuclear Emergency Response Activities (coordination for emergency activities for oil spill and burning, radiological accident in marine and coastal zones, etc)
- …

2 Emerging issues of marine environmental accidents

- oil spills
- accident related to objects (SAR)
- nuclear accidents in marine and coastal zones (after the Fukushima accident)
- other marine environmental hazards (e.g. harmful algal blooms)

3 Strategy for JCOMM on the Marine Accident Emergency Response

(to be considered at JCOMM-IV)

3.1 JCOMM Goal/objective in this area:

- to support NMHS in developing/enhancing capacity to provide met/ocean information and drift information in case of events occur

3.2 Strategy

3.3.1 The MAES element should be set as priority for SPA, and further for the Commission, and develop workplans as cross-PA and cross-programme activities.

3.3.2 Considering the limited resources (expert time, budget) as well as the need for JCOMM to present visible outcome by JCOMM-V through focused efforts, there is a need to set one topic (type of environmental accident) as the focused topic for JCOMM during the next intersessional period (could be enhancing technical capability for forecasting support for radiological accident – the Committee is invited to advise on this matter.)

3.3.3 The respective task/responsibility of each Team (mainly in SFSPA) should be agreed. (example/proposal as following)

[CB in general, therefore probably MAN]

- to plan and support producing training material (which will also be reflected in updating WMO Nos. 471 and 558), and related training initiatives

- General guidance and advice. Intersessional decision can be made by Co-president in consultation upon the recommendations by the designated experts.

[ETMS]

- implementation and operations of the Marine Pollution Emergency Response Support System (MPERSS), including the update/streamlining of MAES-MPERSS Website (http://www.maes-mperss.org)

- update/re-definition of the role of the Area Meteorological and Oceanographic Coordinators (AMOCs) in support of marine pollution monitoring and response, and maritime search and rescue, was basic meteorological and oceanographic information generated by NWP and ocean forecasting systems, including oil spill model outputs (weathering and fate).

[ETOOFS]

- ocean forecasting systems in support of oil spill modeling and radiological dispersion modeling

3.3.4 A small number of experts (e.g. three) should be appointed to be in charge of MAES tasks. Each appointed expert could be a member of multiple Expert Teams that are relevant to MAES (e.g. ETMSS, ETOOFS), and they will work directly with the Co-President, SPA Coordinator and the Secretariat for the planning and conduct of the intersessional work.

3.3 Operation of the Commission's work:

3.3.1 ETMSS should lead setting/streamlining a procedure to provide metocean products and services (probably through ETMSS) in collaboration with other Organizations such as the IMO and IHO. Proposed update may include synchronizing/combining the MPERSS Areas and METAREAs, and subsequently closer coordination between AMOCs and METAREA coordinators. It should also include ways to seek national approval/endorsement of MAES implementation.

3.3.2 Needs and Requirements should be reviewed and re-defined (if necessary). Proposed plans include:

- Review / re-define essential meteorological information for MAES, based on the currently considered issues (e.g. types of accident) and available information:

(examples)
wind speed and direction;
air temperatures;
sea surface temperature;
wave parameters;
visibility;
weather parameters (fog and precipitation);
overall weather conditions.

- Catalogue / document currently available tools for MAES support (e.g. models) and identify gaps (particularly regional gaps).

3.3.3 In order to collect information to conduct above tasks, it is proposed to conduct a survey for national/regional capacity (--> AMOCs in MPRESS context) to respond to the marine environmental accidents, including: a) oil spill, b) radiological accident, c) Search & Rescue

- schedule: draft a survey in 2012 after JCOMM-IV
- initiate a survey for the following 3-6 months
  (need to check if there was any previous survey/questionnaire on these issues)
- report to Co-President and SCG, for further planning on training (material + workshop)

3.3.4 Initiate developing training material /guidance (on modeling, in particular), and plan/conduct at least one training (possibly combined to the MSI training but setting a dedicated session within) during the next intersessional period.

3.4 Resource required:
(the Committee is invited to consider the level of support, and set guideline as clear as possible.)

- Contribution and support by Members / Member States through volunteering experts (to be members of relevant teams/groups)

- Financial support for activities (mainly experts' participation in meetings). It will include ad hoc group meetings, in conjunction with the regular meetings of the relevant ETs / Groups (at least once during the next intersessional period, but not more than the number of relevant ET/Group meetings).

- Secretariat time for coordination and support (particularly for regular surveys and reporting)

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Annex VII

LIST OF DELIVERABLES AND RECOMMENDATIONS FOR SCIENTIFIC AND TECHNICAL DEVELOPMENTS

1. Cross cutting / Joint activities

Deliverable	***Type***	***Body Responsible***	***Time frame***	***Description, status, comments***
Data Cookbook	Deliverable	DMCG/OCG	2009-2012	Oceanographer's and marine meteorologist's cookbook for submitting data in real time and in deployed mode. Status: almost completed.
PP-WET	Pilot	DBCP/ETWS	2009/2011	Description: Wave Measurement from Buoys Evaluation and Testing Pilot Project (http://www.jcomm.info/WET) Status: methodology for inter-comparisons agreed upon, and guide drafted. Results presented at various forums. Need for an ongoing activity after the end of the PP
Extreme wave database	Deliverable	ETMC / ETWS	2010/2012	Status: Resource issues within the national agencies (e.g. NOAA) and the Secretariat to be resolved. Need engagement/contribution of multiple countries. Discussion under way to restructure the project, with a simpler initial design and product. Suggest to be included in the JCOMM workplan after JCOMM-IV
Storm Surge Climatology / DB	Deliverable	ETWS / ETMC	2009-2012	Status: No progress yet to date. Recommendation: Terminate the project.
JCOMM Catalogue of Standards	Deliverable	MAN (with all CGs)	2009-2012	JCOMM Catalogue of Best Practices and Standards. Status: Catalogue published on website. Need focal point for its maintenance
Satellite strategy and data requirements	Deliverables	TT-Sat, activity leaders	2009-2012	(i) Produce a document that provides an integrated (space and *in situ*) observing strategy for a number of geophysical variables. Assess and document the common JCOMM non-climate requirements for achieving enhanced integration between *in situ* and satellite ocean observing systems; these requirements should begin with current system deployments and look forward toward known forthcoming systems. (ii) Propose mechanisms for the feedback of information relating to data quality derived from satellite products to *in situ* observing platforms operators; (iii) Liaise with the WMO Space Programme and address the UNESCO/IOC Strategy for the use of Remote Sensing in oceanography, and other international groups dealing with satellite issues. (iv) Coordinate the collection of information on satellite data requirements and planning, and make it available via the JCOMMOPS website

				Status: Meeting of the TT-Sat during MARCDAT-III. Some action items identified for MAN and SFSPA.
JCOMM SoG	Deliverable	Focal Point (Ali Mafimbo)	2009-2012	Statement of Guidance for Ocean Applications (gap analysis for the WMO Rolling Review of Requirements), and JCOMM contribution to the new Implementation Plan for the Evolution of Global Observing Systems (EGOS-IP) Status: Requirements for Ocean Application were submitted to the Database in May 2011. The current version of the SoG (December 2009) needs some revisions per ET-EGOS-5 & ET-EGOS-6 recommendations (waves, sea-level, polar regions, satellite data for non-climate variables, make ref. to requirements Key gaps submitted to ET-EGOS for the new EGOS-IP.
Review and update of WMO & IOC Publications	Deliverable	Consultants	2010-2012	Review of WMO and IOC Publications (manual and guides) Status: 1) Consultant David Meldrum recruited for end 2011 for publications dealing with instrument practices. Preliminary work to identify issues by intern at WMO Secretariat during May/Aug 2011; 2) Consultant Phil Parker review/revising WMO No. 558 (expected completion in September 2011) and No. 471 (expected completion in November 2011); 3) Guide to Storm Surge Forecasting being published by September 2011.

2. Observations Programme Area

Deliverable	***Type***	***Body Responsible***	***Time frame***	***Description, status, comments***
Satcomm review	Deliverable	OCG/DBCP	Ongoing	Compile and synthesize activities related to satellite data telecommunication systems and data collection options under all programmes and panels of OPA Status: 2011 version provided by BAS
Satcomm user forum	Deliverable	OCG, CBS	2011-2013	Establish an international forum of users of satellite data telecommunication systems with WMO, IOC, FAO as co-sponsors. Status: concept approved by WMO Cg-XVI. CBS requested to approach partner organizations, and liaise closely with JCOMM. ToR and workplan leading to establishment of forum proposed/drafted by CBS-MG. Meldrum to lead for JCOMM/IOC
WIGOS PP	Pilot	OCG, Joint SG	2008/2010	3 levels of integration: instrument practices, data exchange and interoperability between ocean data systems and WIS, Quality Management. Status: Completed. Project Report published with legacy recommendations, lessons learned, impacts/benefits for Members/Member States, strengths and weaknesses of implementation of ocean observing systems
PP-WMD	Pilot	DBCP	2009/2011	Wave Measurements from Drifters Pilot Project.

				Status: Little progress, except review of concurrent developments in a rapidly developing field.
PP-HRSST	Pilot	DBCP	2010/2013	High Resolution SST Pilot Project. Status: Criteria agreed upon between DBCP & GHRSST. New HR SST sensor (0.05C) now being installed on drifters. More than 80 prototypes deployed. Need for a new version that can be easily calibrated. High value pilot area being identified with GHRSST.
PP-Argos3	Pilot	DBCP	2009/2012	Argos-3 (downlink) Pilot Project. Status: Some units deployed. Evaluation still underway.
PP-Iridium	Pilot	DBCP/SOT	2008/2010	Evaluation and Testing of Iridium Satellite Data Telecommunication for the collection of observations from buoys and ships Status: Excellent results in terms of data throughput and timeliness; some issues in terms of operational lifetime. Residual funds being used to target areas where Argos timeliness continues to be an issue (Indian Ocean, S Pacific)
Rigs & Platforms	Deliverable	DBCP	2010-2012	DBCP to take care of standards and practices for Rigs and Platforms, including for instrument/platform metadata. Status: Agreed by SOT, MAN, DBCP. DBCP ToR need to be revised by JCOMM-IV
XBT Fall-rate	Deliverable	SOT/SOOPIP XBT Science Team	2009-2012	Investigate XBT fall rate equation issue, and make recommendation. Status: Workshop in Hamburg, Aug. 2010. XBT Science Team workshop in July 2010
Ship design	Deliverable	SOT, IMO, ICS	2009-2016	Define generic ship design for installing meteorological and oceanographic equipment on ships, and negotiate with ICS, and IMO for their approval. Status: Discussed with ICS & IMO in 2011. “Best practice” document to be drafted with the ICS for ICS approval, then IMO approval.
Ship AWS intercomparison	Deliverable	SOT/VOSP	2011-2013	Conduct an intercomparison of AWS systems installed onboard ships. Status: principle agreed at SOT-VI. Not started yet.
Ship masking	Deliverable	SOT/VOSP	2009-2012	Coordinate the development of a universally accepted solution for the ship call-sign masking for consideration by the WMO Executive Council. Status: Ship masking (SHIP – with parallel distribution system - or MASK – using unique IDs) agreed upon. Universally accepted solution to be based on encryption and the use of BUFR after 2012.
VOS Practices	Deliverable	SOT/VOSP, TT-IS	2009-2012	Further develop the guidelines on standards for instruments and high quality best practices for the Voluntary Observing Fleet and publish them as a JCOMM Technical Report Status: Slowed down because of passing away of Robert Luke. New Chair of SOT TT on Instrument Standards recruited at SOT-VI.
Submarine cables for environmental	Potential pilot	OCG	2011-2013	Through joint ITU/IOC/WMO workshop (Rome, Sept 2011), identify opportunities for pilot project to equip new submarine cables with tsunameters

monitoring				

3. Data Management Programme Area

Deliverable	***Type***	***Body Responsible***	***Time frame***	***Description, status, comments***
META-T	Pilot Project	DMCG	2006-2010	
ODS	Deliverable	ETDMP, TT-ODS	Ongoing	Ocean Data Standards (ODS) Status: Task Team established by ETDMP. Website established. Two standards published (date/times, country codes). Two additional standards under evaluation (CDI, QC flags). Other standards to address will include Units (based on SI), Platform types, Geoarea (IHB), Instrument type, Parameters, Institutions, CRC (cyclic redundancy check)
ODP	Pilot Project	ETDMP, TT-ODP	2009-2012	Ocean Data Portal (ODP), including interoperability with the WMO Information System (WIS) Status: V1: operational. V2: development underway, to be operational in 2012. V2 to be interoperable with the WIS and ODP to become a DCPC.
Metadata	Pilot Projects	ETDMP, TT-metadata	2009-2012	TT-METADATA: Compare discovery metadata profiles (MCP, SeaDataNet CDI, WMO Core) and make recommendations for better interoperability; address ODAS metadata, and META-T. Status: Underway. META-T: Water Temperature Instrument/Platform Metadata Pilot Project. Status of META-T: Completed. Legacy recommendations made.
Migration TDCs	Deliverable	DMCG, TT-TDC	2009-2012	Migration to Table Driven Codes, including BUFR templates and ocean variable common sequences. Status: Trackob, Argo templates operational; XBT, VOS, Buoy templates in validation. Variable-based sequences underway.
MCSS/MCDS	Deliverable	ETMC	2011-2021	Modernization of the Marine Climate Summaries Scheme, new Marine Climate Data System, including modernized VOS delayed mode data flow (DMVOS), Higher Level Quality Control (HLQC), establishing a network of mirrored WMO-IOC Climate Marine Meteorological and Oceanographic Data Centres (CMOCs), and integration of the RNODC/DB and SOC/DB Status: Delayed mode VOS data-flow defined. HLQC in progress. RNODC/DB &

				SOC/DB integration well underway and principles agreed upon (implementation aspects to be discussed). Vision for MCDS agreed upon at MARCDAT-III. ETMC-III proposed establishing CMOCs on the model of the ICOADS.

4. Services and Forecasting Systems Programme Area

Deliverable	***Type***	***Body Responsible***	***Time frame***	***Description, status, comments***
OFS guide	Deliverable	ETOOFS	2009-2012	Description: the 1st Guide for Operational Ocean Forecasting Status: On going - an initial draft is expected by JCOMM-4 Recommendation: Complete and publish the 1st OFS Guide as a top priority for the next intersessional period.
Catalogue on Met-Ocean Object Class for ENC and e-Navigation	Deliverables	ETMSS	2009-2012	Description: Develop Met-Ocean object class catalogue for Electronic Nautical Chart Status: Delayed to JCOMM-4 Recommendation: SFSPA to pursue for the next intersessional period. ETMSS to lead with ETSI to support
UNESCO pilot project on coastal hazard forecasting	Pilot Project	ETWS	2009-2012	Description: support model upgrade to improve storm surge predictability in NIO region Status: regional requirements and workplan identified through regional workshops (2009, 2011). National/regional implementation under way Status: Near completion. Recommendation: to proceed with the final workshop/review in connection with related programmes and activities (e.g. CIFDP, WMO/TCP). Application of the results in all NIO countries.
Wave Forecast Verification	Pilot Project	ETWS	2009-2012 (extension expected)	Description: A routine intercomparison of wave model forecast verification data, for benchmarking and assuring the quality of wave forecast model products Status: participated by 13 centres, 10 running global wave forecast systems Recommendation: A sustained effort. To extended participation by Members/Member Status
CIFDP	Pilot Project	ETWS	2011-2013	Description: see http://www.jcomm.info/CIFDP Status: Project Design, implementation plan are under development. A sub-project is being developed for Bangladesh (see Doc 4.3), and possibly for Dominican Republic Recommendation: continue supporting CIFDP by WMO; encourage Members/Member States to initiate sub-projects (meeting initial requirements for national coordination).

Update sea ice standards	Deliverables	ETSI	2009-2012	Description: Update and publish the WMO sea Ice nomenclature Status: ongoing Recommendation: testing and gradual implementation of updates to WMO sea ice Nomenclature Vol 1-2 and SIGRID3
Sea ice Climatology / DB (GDSIDB)	Deliverable	ETSI	2009-2012	Description: Historical data submitted and QC; Outreach to potential users Status: ongoing Recommendation:update yearly

Annex IX

ONGOING AND PLANNED JCOMM CAPACITY BUILDING ACTIVITIES

Workplan / expected outcome, deliverables	How (Key Activities/Actions)	Timelines	Lead	Cooperate with	Status / Outcome
Services and Forecasting Systems Programme Area (SFSPA)					***see** http://www.jcomm.info/SFSPA --> workplan
Technology transfer/training on ocean forecasting systems	▪ GODAE Summer School	▪ Jan'10, Perth, Australia	ETOOFS		completed
Capacity building on coastal hazard forecasting	▪ 2nd North Indian Ocean Storm Surge workshop	▪ Feb'11, Delhi, India	ETWS, UNESCO/IOC	WMO/VCP IOC/IODE	Following the recommendations and workplans agreed at the 1st workshop (July 2009), the North Indian Ocean modeling team has worked to improve the predictability of their operational storm surge prediction model (IIT-D model). The progress was reviewed at the second workshop, and the regional requirements were reviewed /updated to improve coastal monitoring, warning and service compatibilities, with participation of ETWS, RMIC (Indian Met. Dept.), and national operators in the Region. The upgraded model will be shared by all NIO countries to be applied at the national services, upon request.
Marine forecasting training	▪ Training workshop in Dakar, Senegal	▪ July'10	SFSPA (WMO), U.S. Navy, NOAA	WMO/VCP	completed
Sea Ice Analysis Training: - COMET Modules - Manuals and workshops	▪ Publish 1st COMET module ▪ Develop 2nd COMET module ▪ 3rd Ice analysis workshop ▪ Review English version of Manual for ice experts	▪ Sep'10 ▪ Dec'11 ▪ Jun'11 (workshop)	ETSI, AARI	ETSI IICWG	completed
Application of Satellite obs.	▪ Training workshop in	▪ Dec'09	SFSPA,		completed

Workplan / expected outcome, deliverables	How (Key Activities/Actions)	Timelines	Lead	Cooperate with	Status / Outcome
	Oostende, Belgium ▪ Training workshop – Brazil (2010/2011)		EUMETSAT, NOAA, IODE		
Training on wave forecasting	▪ Training workshop on use of Wave Watch III model in operations	▪ Jan'10, Hyderabad, India	Hendrik Tolman, NCEP	ETWS	completed
Training on storm surge forecasting	▪ 6th JCOMM/TCP Storm Surge Workshop ▪ 7th JCOMM/TCP Storm Surge Workshop	▪ Feb'11, Dominican Republic ▪ Sep'11, Macao	WMO, ETWS	TCP	This series of training workshop has continued during the intersessional period, in collaboration with the Tropical Cyclone Programme (TCP). The curriculum is focused on the hand-on training of the community models for storm surge forecasting, and open source for the coastal hazard mapping. 6th workshop was organized with target countries of the Caribbean region, and 7th workshop is being organizing for the member countries in the Asia-Pacific region.
Observations Programme Area (OPA)					
Build ocean observing/modeling capacities in West Indian Ocean countries, particularly for operation of drifters and mooring, and analysis through Regional Ocean Modelling	▪ 1st DBCP CB workshop in West Indian Ocean ▪ 2nd DBCP CB workshop in West Indian Ocean	▪ Apr'10, South Africa ▪ May'11, Mauritius	DBCP	ASCLME, USA, Mauritius, South Africa	Two workshops were successfully conducted with abnormally high level of interest of West Indian Ocean countries. Over 60 buoy operators and ocean modelling experts from 12 countries participated in the 1st workshop. The 2nd workshop recommended that drifting weather buoys be supplied to African countries as a pilot project (of which the results will be presented at the 3rd workshop).
facilitate adherence of observational data, metadata, and processed observational products to higher level standards for instruments and methods of observation	▪ RMIC Workshop for RA IV (Americas) ▪ RMIC workshop for RA II (Asia, also including some Pacific countries)	▪ Apr'10, USA ▪ Jul'11, China	WMO, USA, China	IOC	These meetings were organized to prove concept of WMO-IOC Regional Marine Instrument Centres (RMICs) following the Recommendation 1(JCOMM-III) and provide training opportunities. They successfully satisfied the demand of developing countries for more training on instrument practices and standards, quality assurance, marine observing

Workplan / expected outcome, deliverables	How (Key Activities/Actions)	Timelines	Lead	Cooperate with	Status / Outcome
					programme management and operational aspects, and data exchange. Discussions was initiated to organize such a workshop in Morocco before JCOMM-IV. (see http://www.jcomm.info/rmic1)
convey important recent developments (e.g. regarding WMO publication No. 47, enhanced PMO communications), promoting global standards of service for the VOS Scheme, as well as building synergies between the different ocean observing system components relying on ship logistics	▪ 4th International workshop of Port Meteorological Officers	▪ Dec'10, USA	SOT	WMO, USA	67 participants from 24 countries attended the workshop, assisted by a panel of 17 trainers. The workshop has been very active and productive resulting in good understanding of international requirements from the participants. The workshop made 17 PMO related recommendations, 1 advisory to PMOs, and 13 recommendations in terms of ship support to global ocean observation
Data Management Programme Area (DMPA) http://www.iode.org					***see also**
	▪ Training Course on the Establishment of National OceanDataPortal nodes in the Black Sea region (ODINBlackSea) for Georgian and Turkish NODCs	▪ Dec'09, Turkey	IODE		The workshop provided technical training on the establishment of OceanDataPortal nodes
	▪ IODE OceanDataPortal national technical meeting	▪ Tianjin, China, 11-15 October 2010	IODE		Provide advice to national institutions regarding the establishment of OceanDataPortal technology
	▪ Advisory mission to Argentina	▪ 4-8 July 2011	IODE		Provide advice to national institutions regarding the establishment of OceanDataPortal technology at the national and international level

Annex VIII

World Meteorological Organization	**Intergovernmental Oceanographic Commission (of UNESCO)**

JOINT WMO-IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)		**JCOMM-IV/Doc. 2.2(1)**
	Submitted by:	WMO Secretary-General and IOC Executive Secretary
	Date:	16.IX.2011
	Distribution:	Restricted
FOURTH SESSION	Original Language:	English
Yeosu, Republic of Korea, 23 to 31 May 2012	Agenda Item:	2.2

PROVISIONAL AGENDA

1. OPENING OF THE SESSION

2. ORGANIZATION OF THE SESSION

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2.2 Adoption of the agenda
2.3 Establishment of committees
2.4 Other organizational matters

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4. REVIEW OF DECISIONS OF THE GOVERNING BODIES OF WMO AND IOC RELATED TO THE COMMISSION

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5.2 Operational requirements and WMO Rolling Review of Requirements
5.3 Requirements for integrated data products
5.4 Climate Services
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6. IN-SITU AND SATELLITE OBSERVING SYSTEMS

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6.2 Instruments and methods of observation
6.3 Coordinated Technical Support for Observing Programmes
6.4 Future Priority for the Observation Programme Area (OPA)

7. DATA MANAGEMENT, INCLUDING INFORMATION SYSTEMS AND DATA EXCHANGE

7.1 Standard Setting and Documentation
7.2 Marine Climatology, including new Marine Climate Data System
7.3 Data Management Practices

7.4 WIS and designation of DCPCs
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8. MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES AND FORECASTING SYSTEMS

8.1 Forecasting Systems and Services
8.2 Supports for Disaster Risk Reduction, Particularly in Coastal Zones
8.3 Safety-Related Marine Meteorological Services
8.4 Quality Management
8.5 Future Priority for the Services and Forecasting Systems Programme Area (SFSPA)

9. CAPACITY DEVELOPMENT AND TECHNOLOGY TRANSFER

10. REVIEW OF TECHNICAL REGULATIONS OF INTEREST TO THE COMMISSION, INCLUDING GUIDES AND OTHER TECHNICAL PUBLICATIONS

11. RELATIONSHIP WITH OTHER PROGRAMMES AND BODIES

11.1 Programmes and bodies of WMO and IOC
  11.1.1 Other WMO Technical Commissions and Programmes
  11.1.2 Other IOC Programmes

11.2 Organizations and bodies
  11.2.1 UN System Agencies
  11.2.2 Non-UN System organizations and programmes
  11.2.3 Industry and commerce
  11.2.4 Other

12. JCOMM PROGRAMME AND PLANNING

12.1 WMO and IOC Strategic Planning and the JCOMM Strategy
12.2 Future Work Programme and Operating Plan
12.3 Review of Previous Resolutions and Recommendations of the Commission and of Relevant Resolutions of the Governing Bodies of WMO and IOC
12.4 Establishment of Groups and Expert Teams and nomination of Rapporteurs
12.5 Date and place of the fourth session

13. SCIENTIFIC AND TECHNICAL WORKSHOP - IMPROVING MARINE AND OCEAN DATA PRODUCTS FOR SCIENCE AND SOCIETY: THE ROLE OF JCOMM

14. ELECTION OF OFFICERS

15. CLOSURE OF THE SESSION

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Annex X

World Meteorological Organization		**Intergovernmental Oceanographic Commission (of UNESCO)**
JOINT WMO-IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)		**JCOMM-IV/Doc. 2.2(2)**
	Submitted by:	WMO Secretary-General and IOC Executive Secretary
	Date:	27.XII.2011
	Distribution:	Restricted
FOURTH SESSION	Original Language:	English
Yeosu, Republic of Korea, 23 to 31 May 2012	Agenda Item:	2.2

EXPLANATORY MEMORANDUM RELATING TO THE PROVISIONAL AGENDA

1. OPENING OF THE SESSION

The fourth session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) will be held in Yeosu, Republic of Korea, from 23 to 31 May 2012. The opening ceremony will take place at 10.00 hours on Wednesday, 23 May 2012. Information on material arrangements for the session is provided in JCOMM-IV/INF.1. The opening ceremony will be followed on 23 May 2012 by a keynote scientific presentation and informational presentations on each JCOMM Programme Area. The Scientific and Technical workshop will take place 24 and 25 May 2012. Plenary sessions of the Commission, with full language interpretation, will start Monday 28 May 2012 and are expected to finish by mid-day on Thursday 31 May 2012.

2. ORGANIZATION OF THE SESSION

This fourth session of the Joint Technical Commission falls under the responsibility of IOC and will be conducted according to the WMO Regulations governing sessions of technical commissions[1].

2.1 Consideration Of The Report On Credentials

A list of the representatives attending the session will be made available, as soon as possible after the opening of the session[2]. This list will be based on the credentials received by the Secretary-General of the WMO and/or the Executive Secretary IOC before the session and those handed to the Secretary-General's (WMO) or the Executive Secretary's (IOC) representative at the session.

[1] in accordance with the Memorandum of Understanding (MoU) between WMO and IOC regarding Secretariat cooperation in servicing JCOMM

[2] pursuant to General Regulations 20 to 23 of the WMO General Regulations (WMO-No. 15) as well as the Memorandum of Understanding (MoU) between WMO and IOC regarding Regulatory and Procedural Aspects of the Conduct of the Session

To enable the Secretariat to send the documentation relating to the session[3] in advance, directly to the representatives of Members and Member States who will attend, it is desirable that the Secretariats of the Organizations be notified, as soon as possible before the opening of the session, of the name(s) of the person(s) who will constitute the delegation. This communication may be combined with the submission of credentials by sending the latter sufficiently in advance of the session.

2.2 Adoption Of The Agenda

Participants will be invited to consider and adopt this provisional agenda[4]. Additional items for the agenda may be forwarded to the Secretariats before the session, but preferably not later than 30 days before the opening of the session[5]. Explanatory memoranda and working papers should accompany such proposals. The agenda may be amended at any time in the course of the session[6].

2.3 Establishment Of Committees

The technical work of the session will be carried out in Plenary, chaired by the co-presidents. The Commission may wish to appoint additional experts to support the co-presidents as chairs for specific technical agenda items.

Credentials, Nomination, Drafting and Coordination Committees

The Commission will be invited to establish, for the duration of its session, a Credentials Committee, a Nominations Committee, a Drafting Committee, a Coordination Committee and such other committees as it deems necessary[7].

The Commission will decide when dealing with agenda item 2.1 whether or not a **Credentials Committee** should be established. At previous sessions of the Joint Technical Commission, this was considered unnecessary.

In order to facilitate the election of officers, it is normal practice to set up a **Nomination Committee,** which shall prepare and submit to the Plenary a list of the nominees for each office or place for which an election is to be held.

The drawing up the final text of the decisions to be adopted can be done either by a **Drafting Committee**[8] or, if the Commission decides not to establish it, by the representative of the Secretary-General (WMO) and the Executive Secretary (IOC) in consultation with the co-presidents of the Commission. Experience acquired during past sessions shows that the most expedient method has been the second option. The decisions of the constituent bodies are expected to be adopted in their final form during the session[8].

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[3] All the documents required for the JCOMM-IV session will be made available on the web at www.jcomm.info/jcomm-iv. To reduce the carbon footprint of the session, a hard copy of the documents will only be mailed to participants by request. Participants are encouraged to work with electronic documents.

[4] which in accordance with Regulation 190 includes items that are normally included in a provisional agenda, as well as any items submitted by the President of WMO, the Chairperson of IOC, the Executive Councils of WMO and IOC, other commissions, associations, committees, the United Nations and Members/Member States

[5] Regulation 189

[6] Regulation 192

[7] Regulations 22, 24, with the functions of these committees laid out in Regulations 22 and 26 to 31

[8] Regulation 27

To ensure proper coordination of the work of the session, it is the usual practice to set up a **Coordination Committee**[9].

Experience from past sessions has also shown that it is useful to establish a **Selection Committee** for selecting members of the working groups (or similar bodies) established by the session and for nominating individual experts to undertake specific tasks. Such a committee may be composed of several delegates and a representative of the WMO and IOC Secretariats.

2.4 Other Organizational Matters

The Commission may wish to examine details not dealt with under items 2.1 to 2.3 above, such as the working hours of the meeting. The Commission may wish to consider an approach to the consideration of the primary technical agenda items (items 5 to 10), whereby general activities under these items are reviewed in "information sessions", with proposed specific actions, decisions and recommendations of the Commission being addressed in separate committees or plenary sessions as proposed under agenda item 2.3.

3. REPORT BY THE CO-PRESIDENTS OF THE COMMISSION

This report will provide an overview of activities and achievements of the Commission since its third session, with emphasis on the work of the Management Committee and an introduction to the overall strategy and vision for JCOMM in the future. The report will recall that JCOMM exists to assist national meteorological and oceanographic agencies to deliver on their governmental requirements to provide observations, data and services to users, and helps coordinate the work of IOC and WMO at the international level.

The Commission will be invited to have a general discussion on this report, and refer any points requiring detailed study or subsequent action by the Commission.

4. REVIEW OF DECISIONS OF THE GOVERNING BODIES OF WMO AND IOC RELATED TO THE COMMISSION

The Commission will be informed of decisions of the WMO Sixteenth Congress and Twenty-sixth session of the IOC Assembly that are relevant to its work and will be invited to agree on follow-up actions, as required.

5. SCIENTIFIC AND OPERATIONAL REQUIREMENTS

5.1 GOOS-GCOS Requirements for Climate Observations

One important task for JCOMM is the implementation and maintenance of an operational system to provide global physical ocean observations for climate, in the context of the common GOOS-GCOS Ocean Climate Module. In consideration of the scientific design of this module, the Commission will receive and review a report from the GOOS-GCOS-WCRP Ocean Observations Panel for Climate (OOPC), and be invited to comment and recommend any specific actions that might feed into the development of the JCOMM intersessional workplan.

5.2 Operational requirements and WMO Rolling Review of Requirements

[9] the composition of which is specified in Regulation 28

The Commission will be presented with a report on requirements for marine observational data for global/regional Numerical Weather Prediction (NWP), synoptic meteorology, and a range of other non-climate applications arising from the WMO Rolling Review of Requirements including the Statement of Guidance (SoG) for Ocean Applications. The Commission will be invited to review the documented requirements and provide recommendations as appropriate.

5.3 Requirements for integrated data products

Following on from the success of the Group for High-Resolution Sea Surface Temperature (GHRSST) in streamlining the production of and access to sea surface temperature products, the Commission will be presented with ideas for new and better ways to utilise space and in situ data in production of data products for research and operations. New cross-cutting work on surface vector winds will be discussed for inclusion in the intersessional workplan.

5.4 Climate Services

The Commission will review the progress in developing a Global Framework for Climate Services (GFCS), following the decisions and recommendations of the 3rd World Climate Conference (WCC-3, Geneva, September 2009), and deliberate on the Commission's role in this process in collaboration with relevant bodies and programmes. In view of setting a future strategy for JCOMM in addressing the framework, the Commission will discuss on a process for JCOMM to determine both technical and user requirements for climate services under GFCS, considering identified challenges in both research and operational terms.

5.5 Others

The Commission will consider and advise on any additional requirements for marine data, products and services not covered under previous sub-items, including those being developed for coastal applications, research activities and hydrology. It will be invited to advise on ways of addressing requirements as they become available.

6. IN-SITU AND SATELLITE OBSERVING SYSTEMS

The overall goal of the Observations Programme Area (OPA) is to coordinate implementation and standards of global in situ ocean and marine meteorological observing networks, promoting coordination amongst networks and with other organizations and programs, including with satellite ocean observation programmes. The OPA is comprised with the Ship Observations Team (SOT) and its component panels, the Data Buoy Cooperation Panel (DBCP) and its Action Groups, the Global Sea Level Observing System (GLOSS) Group of Experts, a link to the Argo Science Team, OceanSITES, the International Ocean Carbon Coordination Project (IOCCP), and the Global Ocean Ship-Based Hydrographic Investigations Program (GO-SHIP). Technical coordination for many of these panels is provided through the JCOMM In Situ Observing Platform Support Centre (JCOMMOPS). The coordination between these Groups/Panels and other relevant programmes are ensured through the Observations Coordination Group (OCG). Under this agenda item, the Commission will review the achievements of these components and discuss on the workplan for the next intersessional period, with particular attention to the key issues as described under the sub-items. Some OPA components related to the Capacity Building and Quality Management will be dealt with under separate agenda items. Under this agenda item, the Commission will also review the status of implementation of the WMO Integrated Global Ocean Observing System (WIGOS), and the JCOMM role in this implementation, with a particular focus on the implementation of the legacy recommendations from the JCOMM Pilot Project for WIGOS.

6.1 JCOMM OPA Implementation Goals

The Commission will review the OPA Implementation Goals (OPA-IG) and progress in implementing these goals. The OPA-IG have been updated based on the 2010 update of the GCOS Implementation Plan as well as on the recommendations of the Framework for Ocean Observations following the OceanObs'09 conference (21-25 September 2009, Venice, Italy, www.oceanobs09.net). Considering the role of JCOMM OPA in building the climate component of a sustained Global Ocean Observing System (GOOS) as well as in providing the baseline for non-climate applications and further Global Framework for Climate Services (GFCS), the Commission will provide guidance for updating the Implementation Goals and address its implementation by Members/Member States.

In relation to agenda item 5.3, the Commission will also address integrating space and in situ observing systems and be invited to advise on specific actions which may be taken to facilitate access to these systems and their application by Members/Member States.

6.2 Instruments and methods of observation

The Commission will review the progress in establishing the network of WMO-IOC regional marine instrument centres that deal with instrument testing, standardization, calibration and intercomparison, and the standardization of observation practices and procedures. The Commission will be invited to make the relevant recommendations for addressing instrument issues.

6.3 Coordinated Technical Support for Observing Programmes

Based on the JCOMM Resolution 3 (JCOMM-I), Resolution 3 (JCOMM-II), Resolution 2 (JCOMM-III) and Recommendation 2 (JCOMM-III), the JCOMM in-situ Observing Programme Support Centre (JCOMMOPS) has been providing a wide range of tools, facilities and services to support the work of the DBCP, the SOT, OceanSITES, and Argo programmes. The Commission will review the activities and achievements made by the JCOMMOPS, and will advise on the future development of and support by JCOMMOPS for various sustained observing systems.

6.4 Future Priority for the Observation Programme Area (OPA)

Taking into account the discussion under relevant agenda items, the Commission will review, make necessary modifications and endorse the proposed future priority activities for the next intersessional period for the OPA.

7. DATA MANAGEMENT, INCLUDING INFORMATION SYSTEMS AND DATA EXCHANGE

The JCOMM Data Management Programme Area (DMPA) aims to coordinate the enhancement and long-term maintenance of an integrated global marine meteorological and oceanographic observing and data management system, in close collaboration with the IOC International Ocean Data and Information Exchange (IODE) and WMO Information System (WIS). The Commission will review the achievements within the DMPA and discuss on the workplan for the next intersessional period, with particular attention to the key issues as described under the sub-items. Some DMPA components related to the Capacity Building, Quality Management, and requirements for satellite observations/data will be dealt with under separate agenda items.

7.1 Standard Setting and Documentation

The Commission will review the Data Management Plan and a report on the progress of its implementation, as well as the progress of the IODE-JCOMM Ocean Data Standards Pilot Project that aims to moderate and guide the development and recommendation of standards and best practices following the Recommendation 4(JCOMM-III). It will also review the status of exist /

planned documentation including the *JCOMM Cookbook for the submission of ocean data in real time and delayed mode*, *Catalogue of Standard and best Practices*, and other related manuals and guides. The Commission will be invited to decide on specific actions and recommendations required for the implementation of the Data Management Plan.

7.2 Marine Climatology

The Commission will review a report on the progress of marine climatology activities, including the results of the 3rd International Workshop on Advances in the Use of Historical Marine Climate Data (MARCDAT-III, Italy, May 2011); modernization and restructuring of the Marine Climatology Summaries Scheme (MCSS) including the proposed vision of a new Marine Climate Data System, and the establishment of a network of mirrored Climate Marine Meteorological and Oceanographic Centres (CMOCs); and the proposal for streamlining/integration of the existing centers and data systems. It will also review progress in the development of the JCOMM ODAS Metadata centre (ODASMS), following the Recommendation 3(JCOMM-III). The Commission will be invited to decide on specific actions and recommendations required for their implementation

7.3 Data Management Practices

The Commission will review the development of the IODE Ocean Data Portal (ODP), the WMO Information System (WIS) and the JCOMM-IODE standards process related to ocean data management and exchange. The Commission will finally be invited to make recommendations regarding these activities and provide guidance on future actions.

7.4 WMO Information System (WIS) and designation of Data Collection or Production Centres (DCPC)

The Commission will review recent developments in the WIS of relevance to JCOMM. This will include in particular the designation, to date, of eight existing or potential centres supporting the JCOMM work programme, as JCOMM DCPCs. The Commission will be invited to identify additional existing or potential centres which might also be put forward as candidate DCPCs.

7.5 Future Priority for the Data Management Programme Area (DMPA)

Taking into account the discussion under relevant agenda items, the Commission will review, make necessary modifications and endorse the proposed future priority activities for the next intersessional period for the DMPA.

8. MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES AND FORECASTING SYSTEMS

The JCOMM Services and Forecasting Systems Programme Area (SFSPA) aims to provide coordinated support for national services to enhance capabilities for marine meteorological and oceanographic services. The Commission will review the achievements within the SFSPA and discuss on the workplan for the next intersessional period, with particular attention to the key issues as described under the sub-items. Some SFSPA components related to the Capacity Building, Quality Management, and requirements for satellite observations/data will be dealt with under separate agenda items.

8.1 Forecasting Systems and Services

The Commission will review activities regarding met-ocean monitoring, modelling and services, as well as sea ice and polar region activities. It will also be reported on the progress in developing a Guide to Operational Ocean Forecasting, following the Recommendation 5 (JCOMM-

III). The Commission will then advise on enhancements to this in support of national and international requirements including the forecasting products for marine environmental emergencies.

8.2 Supports for Disaster Risk Reduction, Particularly in Coastal Zones

The Commission will review achievements of JCOMM during the intersessional period, in support of disaster risk reduction and emergency responses, particularly those contributing to a comprehensive marine and coastal multi-hazard forecasting and warning system. The Commission will then discuss and recommend specific actions to address emerging requirements for such services in coastal zones, including the Storm Surge Watch Scheme (SSWS) following the Recommendation 6 (JCOMM-III) and pilot initiatives such as the joint JCOMM/CHy project on Coastal Inundation Forecasting Demonstration Project (CIFDP).

8.3 Safety-Related Marine Meteorological Services

The Commission will be invited to review the status of implementation of user focused marine meteorological and oceanographic services, including those provided within the context of the Global Maritime Distress and Safety System (GMDSS), and to advise on specific actions to improve such services. It should further review expanding and varying requirements for such services, including sea ice and IMO-WMO Worldwide Met-Ocean Information and Warning Service following the Recommendation 7 (JCOMM-III). It will also consider JCOMM's support for activities relevant to marine accident emergencies, and will decided on the Commission's future work related to marine environmental pollution including the Marine Pollution Emergency Response Support System (MPERSS), through SPA coordination with relevant Organizations such as IAEA and IMO. The Commission will finally recommend actions to assist in the provision of such services in the most efficient and effective manner.

8.4 Quality Management

The Commission will be reported on the progress in developing Quality Management Systems (QMSs) for marine meteorology and oceanography, following the Recommendation 8 (JCOMM-III). The Commission will discuss the need for extending an overall Quality Management approach as well as for the implementation and certification of Quality Management Systems by Members delivering marine services, and will advise on the relevant actions to be taken during the next intersessional period.

8.5 Future Priority for the Services and Forecasting Systems Programme Area (SFSPA)

Taking into account the discussion under relevant agenda items, the Commission will review, make necessary modifications and endorse the proposed future priority activities for the next intersessional period for the SFSPA.

9. CAPACITY DEVELOPMENT AND TECHNOLOGY TRANSFER

During the intersessional period, activities related to capacity development, specialized education and training in marine meteorology and oceanography have taken place as part of the work programmes of the Programme Areas (PAs). The Commission will review the relevant activities in collaboration with the other WMO and IOC programmes, such as the IODE Ocean Teacher and Ocean Data and Information Networks (ODINs).

The Commission will also be invited to review ongoing technology transfer and implementation support activities of the WMO and the IOC which are of direct relevance to JCOMM, and to propose new initiatives and projects as appropriate.

10. REVIEW OF TECHNICAL REGULATIONS OF INTEREST TO THE COMMISSION, INCLUDING GUIDES AND OTHER TECHNICAL PUBLICATIONS

According to its terms of reference, the Commission should prepare and keep up-to-date relevant parts of the Technical Regulations of WMO. The Commission will therefore review the Technical Regulations concerned, the marine related guides and manuals of WMO, as well as relevant manuals and guides of IOC, and propose any changes, which may be required.

11. RELATIONSHIP WITH OTHER PROGRAMMES AND BODIES

11.1 Programmes and bodies of WMO and IOC

Close coordination and collaboration with other WMO and IOC programmes and bodies is required for the implementation of the JCOMM work programme. The Commission will review the activities of WMO and IOC programmes and bodies relevant to JCOMM, particularly the WMO Integrated Global Observing System (WIGOS), Global Ocean Observing System (GOOS), Global Climate Observing System (GCOS), WMO Information System (WIS), IOC Integrated Ocean Data and Information Exchange (IODE), IOC Integrated Coastal Area Management (ICAM) and IOC Intergovernmental Coordination Groups for the Tsunami Warning and Mitigation System (ICG/TWS). The Commission It will be invited to advise on the role, contributions and specific actions which JCOMM might be taken to enhance inter-programme coordination.

11.2 Organizations and bodies

Other matters of interest to the Commission, which involve cooperation between WMO and IOC, other organizations and bodies with major marine interests (e.g., UN system agencies; non-UN system organizations and programmes such as GEO, POGO, CEOS, industry and commerce) will be discussed under this agenda item. The Commission will be invited to advise on additional issues and organizations where coordination and cooperation would be of benefit to the work of JCOMM.

12. JCOMM PROGRAMME AND PLANNING

12.1 WMO and UNESCO/IOC Strategic Planning and the JCOMM Strategy

The Sixteenth WMO Congress approved the WMO Strategic Plan for the period 2012-2015. The IOC is operating under a Medium-Term Strategy addressing High-level Objectives for 2008-2013, and will develop a revised Medium-Term Strategy for adoption by the 27th IOC Assembly in 2013. The Commission will be invited to review these Plans as far as they concern Marine Meteorology and Oceanography, in view of streamlining the JCOMM Strategy with these Plans.

12.2 Future Work Programme and Operating Plan

Based on the discussion and decisions on agenda items 5 to 10, the WMO Strategic Plan and the IOC Medium-Term Strategy, the Commission will be invited to develop and adopt a comprehensive work programme and its operating plan for the coming intersessional period.

12.3 Review of Previous Resolutions and Recommendations of the Commission and of Relevant Resolutions of the Governing Bodies of WMO and IOC

The Commission will review the resolutions and recommendations adopted by both CMM, the Joint Committee for IGOSS and JCOMM at previous sessions of these bodies, as well as

relevant resolutions of the Governing Bodies of WMO and IOC, with a view to deciding on those to be kept in force and those to be considered out of date10.

12.4 Establishment of Groups and Expert Teams and nomination of Rapporteurs

The Commission will reestablish a substructure of working groups, expert teams and rapporteurs to carry out the activities decided during the session as appropriate to the implementation of the Commission's terms of reference[11]. As suggested under paragraph 2.3 of this explanatory memorandum, a special committee may be established for the purpose of such nominations. It is planned that discussions on specific elements of a proposed subsidiary structure for JCOMM should take place in conjunction with the relevant technical agenda items.

12.5 Date and place of the fifth session

Delegates of Members/Member States attending the session are invited to present an invitation from their governments for the fifth session of the Commission to be held in their countries[11]. The Commission may wish to consider any such invitations or suggestions regarding the date and venue of the fifth session.

13. SCIENTIFIC AND TECHNICAL CONFERENCE - IMPROVING MARINE AND OCEAN DATA AND PRODUCTS FOR SCIENCE AND SOCIETY: THE ROLE OF JCOMM

Time will be allocated on 24 and 25 May 2012 for a Scientific and Technical Conference on the theme of "*Marine and Ocean Services in support of the GFCS*". Adequate time will be allowed for discussion of this activity for JCOMM, and the Commission may wish to propose follow-up action on issues raised during these discussions.

14. ELECTION OF OFFICERS

The Commission shall elect two co-presidents to hold office until the end of the next session of the Commission[12].

15. CLOSURE OF THE SESSION

The third session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology is scheduled to close on Thursday 31 May 2012.

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[10] in accordance with Regulation 190 of the WMO General Regulations

[11] in accordance with Regulation 187

[12] Details regarding eligibility and procedures for election are given in Regulations 11, 26, 63, 79 through 82, 84, 86, 89 and 183 of the WMO General Regulations and Resolution 37 (Cg-XI). Further guidance regarding the co-presidency is given in the general summaries of the final reports of the Thirteenth WMO Congress (paragraph 3.4.4.5), of the Twentieth IOC Assembly (paragraph 262) and of WMO EC-LII (paragraph 6.4.5).

Annex XI

JCOMM-IV Provisional Documentation Plan: DOC[13]

(Languages: E/F/S/R/A/C; Total words: 60.000)

Agenda item	Short title	Number of words	By	Submission date
2.2	Provisional agenda	500	WMO-IOC Secretariats	20 Sep 2011
2.2	Explanatory memorandum	5000	WMO-IOC Secretariats	20 Sep 2011
3	Report by the co-presidents	2000	Co-presidents	15 Dec 2011
4	Review decisions by Governing Bodies	2000	WMO-IOC Secretariats	15 Oct 2011
5.1	GOOS-GCOS requirements for Climate Observations	1500	Chair OOPC and WMO-IOC Secretariats	15 Oct 2011
5.2	Operational requirements and WMO Rolling Review of Requirements	1500	Chair CBS / ET-EGOS, SPA coordinator, and WMO-IOC Secretariats	15 Nov 2011
5.3	Requirements for integrated data products	1500	Satellite activity leaders and IOC-WMO secretariats	15 Oct 2011
5.4	Climate Services	1000	WMO-IOC Secretariats and co-presidents	15 Oct 2011
6	JCOMM Observations Programme Area: achievements and future priorities	4000	OPA coordinator, TC/DBCP and WMO-IOC Secretariats	15 Dec 2011
6.1	JCOMM OPA Implementation Goals	1000	OPA coordinator	15 Nov 2011
6.2	Global/Regional coordination for Instrumentation issues	1500	WMO-IOC Secretariats	15 Nov 2011
6.3	Coordinated Technical Support for Observing Programmes (JCOMMOPS)	1500	OPA Coordinator, TC/DBCP, TC/Argo and WMO-IOC Secretariats	15 Nov 2011
7	JCOMM Data Management Programme Area: achievements and future priorities	2000	DMPA coordinator and WMO-IOC Secretariats	15 Dec 2011
7.1	Standard setting and Documentation	1500	DMPA chair and WMO-IOC Secretariats	15 Nov 2011
7.2	Marine Climatology	4000	ETMC Chair and WMO-IOC Secretariats	15 Nov 2011
7.3	Data Management Practices	500	DMPA Coordinator	15 Nov 2011
7.4	WIS and designation of DCPCs	500	Co-President, DMPA Coordinator and Secretariat	15 Nov 2011
8	JCOMM SFSPA: achievements and future priorities	3000	SPA coordinator and WMO-IOC Secretariats	15 Dec 2011
8.1	Forecasting Systems and Services	2000	SPA coordinator, ETWS, ETSI, ETOOFS chairs	15 Nov 2011
8.2	Supports for Disaster Risk Reduction, Particularly in Coastal Zones	2000	WMO-IOC Secretariats, SPA coordinator and	15 Nov 2011

[13] DOC – text for inclusion in the general summary of JCOMM-IV (decisions and actions), Draft Recommendations and/or Resolutions, and a background information report containing only relevant topics (when required to understand the context of the draft text for inclusion in the general summary of JCOMM-IV)

Agenda item	Short title	Number of words	By	Submission date
			ETWS Chair	
8.3	Safety-Related Marine Meteorological Services	2000	ETMSS, ETSI, ETOOFS chairs and WMO Secretariat	15 Nov 2011
8.4	Quality Management	2500	QM Activity Leader and WMO Secretariat	30 Sep 2011
9	Capacity Development and Technology Transfer	2500	CB Activity Leader and WMO-IOC Secretariats	30 Sep 2011
10	Review technical regulations, guides and other publications	2000	WMO-IOC Secretariats	30 Sep 2011
11.1	Programmes and Bodies of WMO and IOC	2000	WMO-IOC Secretariats	15 Oct 2011
11.2	Relationship with Organizations and Bodies	2000	Co-presidents and WMO-IOC Secretariats	15 Oct 2011
12.1	WMO-IOC Strategic Planning and JCOMM strategy	2000	WMO-IOC Secretariats and Co-presidents	30 Sep 2011
12.2	JCOMM Work plan and Operating plan	2000	Co-presidents and WMO-IOC Secretariats	15 Jan 2012
12.3	Review previous resolutions and recommendations	1500	WMO-IOC Secretariats	15 Dec 2011
12.4	Establishment of groups, etc.	2500	WMO-IOC Secretariats	30 Sep 2011

JCOMM-IV Documentation Plan: INF[14]
(Languages: English only; Total words: 12.000)

Agenda item	Short title	Number of words	By	Submission date
	Logistics for JCOMM-IV		Conference Officer (IOC)	15 Dec 2011

JCOMM-IV Documentation Plan: BAK[15]
(Languages: E only; Total words: no limit)

Agenda item	Short title	Number of words	By	Submission date
6	Report OPA		OPA Coordinator	15 Jan 2012
7	Report DMPA		DMPA Coordinator	15 Jan 2012
8	Report SFSPA		SFSPA Coordinator	15 Jan 2012
9	Report CB		CB Activity Leader	15 Jan 2012

[14] INFO – progress/activity report
[15] BAK – background information (informal document)

Annex XII

JCOMM-IV Provisional List of Resolutions and Recommendations

1. Resolutions

1) [structure/establishment, item 12.4] Management Committee
2) [structure/establishment, item 6, 12.4] OPA
3) [structure/establishment, item 7, 12.4] DMPA
4) [structure/establishment, item 8, 12.4] SFSPA
5) [item 12.3] Review previous resolutions

2. Recommendations

1) [item 5.3, 13.4] Structure / Coordination for JCOMM Satellite requirements
2) [Item 5.4] JCOMM contribution to GFCS
3) [item 6.2] RMIC *(review/recommendation if there are new applications, short)*
4) [item 6] JCOMMOPS *(only if needed to change ToRs / duties, etc.)*
5) [item 7.1] Data Management Standard and Documentation *(if any, perhaps from the standards project)*
6) [item 7] Provision of instrument platform metadata
7) [item 7.2] Marine Climate Data System, including WMO-IOC Climate Marine Meteorological and Oceanographic Data Centres (CMOCs)
8) [item 8.2, 8.3, 7.1] Guide to Wave Analysis and Forecasting *(update)*
9) [item 8.3] IMO/WMO Worldwide MetOcean Ocean Information and Warning Services (IMO resolution / extension / plan)
10) [Item 8.3] Development of capability for oceanic radiation tracking
11) [item 10, 8.3] Amendments to the WMO Global Maritime Distress and Safety System Marine Broadcast System (if any)
12) [item 10] Amendments to the WMO Technical Regulations, including the Manual on Marine Meteorological Services (WMO No. 558) and the Guide to Marine Meteorological Services (WMO No. 471) (if any)
13) [item 10] Amendments to the Marine Climatological Summaries and the WMO Voluntary Observing Ship Scheme (if any)
14) Review of relevant WMO-IOC Resolutions

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Annex XIII

LIST OF ACTIONS

Para	Action	By whom	When/target
3.1.3	To review the "Prioritized Action Plan for Implementation of the Coastal Module of GOOS" compiled by PICO	SFSPA ETs, coordinated by ETWS	ASAP
3.2.4	To identify the adequacy of the observations for particular purposes (in reviewing OPA implementation targets)	OCG in coordination with ET-EGOS	continuous
3.2.5	To develop quantitative information on ship time requirements (e.g. what is available, what is required, costs), and to include it in the report to JCOMM-IV	OCG with JCOMMOPS	November 2011
3.2.6	To proactively support establishment of RMICs	MAN with input from OCG, Secretariat	continuous
3.2.7	To investigate ways to add training information to OceanTeacher (e.g. instrument practices, network implementation, data exchange)	OCG	December 2011
3.2.7	To assist improving access to near-real-time ocean observations, in integrated datasets, by all scientific and operational users (including researchers, non-meteorological agencies and tsunami warning focal points)	OCG with JCOMMOPS	continuous
3.2.8	To finalize OPA report to JCOMM-IV	OPA Coordinator	November 2011
3.2.11	To develop clearer ways to communicate with the end users, and to include it in the DMPA report to JCOMM-IV	DMPA Coordinator with DMCG	November 2011
3.2.12	To develop new data flow metrics on "How ocean data are getting into the operational systems in real-time (quantity; timeliness)", and update the Data Management Plan	DMCG	ASAP
3.2.13, 4.1.5	To carry out the development of a new Marine Climate Data System (MCDS) and associated strategy	ETMC through TT-MCDS	November 2011
3.2.14	To finalize the "Oceanographer's cookbook for submitting ocean data in real-time and delayed mode"	DMCG, OCG	May 2012 (JCOMM-IV)
3.2.15	To update " JCOMM Catalogue of Practices and Standards"	OCG, SCG, DMCG	continuous
3.2.18	To address the issue of data utilization: how to use the data, and what is the feedback from the user community (including NWP) in terms of impact, quality, etc	DMCG	November 2011 (report to JCOMM-IV)
3.2.19	To finalize DMPA report to JCOMM-IV	DMPA Coordinator	November 2011
3.2.28	To finalize SFSPA report to JCOMM-IV	SFSPA Coordinator	November 2011
3.3.2	To setup a plan to establish a Surface Vector Wind (SVW) group to function like the GHRSST, in close collaboration with the interested satellite and in situ communities, to be submitted to JCOMM-IV	TT-SAT	November 2011 (report to JCOMM-IV)
3.3.3	To prepare a set of recommendations on the work of JCOMM for dealing with satellites and satellite products, and for streamlining JCOMM's activities to deliver requirements	TT-SAT	November 2011 (report to JCOMM-IV)
3.3.4	To amend TT-SAT ToR: replacing "non-climate requirements" with "additional requirements" so that the general non-GCOS requirements such as for the GFCS can also be taken into account	TT-SAT, Secretariat	ASAP

Para	Action	By whom	When/target
3.3.5	To review and revise the JCOMM input to RRR, SoG for Ocean Applications, based on the JCOMM User Requirement Document	Ali Mafimbo	November 2011 (report to JCOMM-IV)
3.3.5	To develop a brief document on satellite product requirements, for endorsement by higher level and wider community	Ali Mafimbo, Secretariat	November 2011 (report to JCOMM-IV)
3.3.11, 4.6.4	To explore ways to develop a training module on QMF for marine meteorological and oceanographic services	Activity Leader on QMF/QMS, Activity Leader on Capacity Building, Secretariat in collaboration with COMET, WMO/ETR and OceanTeacher	ASAP
3.3.12	To continue to have an Activity Leader on QMS/QMF in the JCOMM Structure (in MAN) for the next intersessional period	MAN	continuous
4.1.2 (i)	To complete review of WMO-IOC publications on instrument practices	David Meldrum, Secretariat	December 2011
4.1.2 (ii)	To draft a Recommendation for JCOMM-IV to encourage Member/Member States to collect and submit platform metadata	DMCG, Secretariat	November 2011 (report to JCOMM-IV)
4.1.2 (iii)	To send letters to potential countries for hosting RMICs to extend a RMIC network	Secretariat	May 2012 (JCOMM-IV)
4.1.3, 4.1.4	To establish and/or enhance monitoring institutional arrangements for data flow to end users (particularly those through WIS/GTS system)	OCG, DMCG	November 2011 (report to JCOMM-IV)
4.1.6	To investigate and document issues / problems / proposed solutions regarding operational ocean data flow	OCG, DMCG	November 2011 (report to JCOMM-IV)
4.2.3	To conduct the regular Marine Meteorological Monitoring Survey (MMMS) through PMOs and IMO/IHO contacts and other programmes, and report the results to JCOMM-IV	ETMSS, Secretariat	December 2011 (report to JCOMM-IV)
4.2.10	To finalize and submit an outline of a Strategy for the JCOMM Activities on the Marine Accident Emergency	SCG, WMO Secretariat	November 2011 (report to JCOMM-IV)
4.2.10	To develop/enhance JCOMM activities on marine accident emergency, based on the developed strategy (above)	MAN, ETMSS, WMO Secretariat	continuous
4.3.2	To develop proposals to include information on complex sea states as well as associated terminology in weather and sea bulletins to be disseminated through SafetyNET and NAVTEX	ETMSS, ETWS	JCOMM-V
4.3.3	To continue to support Storm Surge Watch Scheme (SSWS), , including the series of training workshop on storm surge and wave forecasting	WMO Secretariat, ETWS, with TCP	continuous
4.3.4	To convene the 8th JCOMM/TCP training workshop on storm surge and wave forecasting for the South/East African and West Indian Ocean countries	WMO Secretariat, ETWS, with TCP	2012
4.3.10	To document the established procedure and best practice through CIFDP, for guide/reference of Members / Member States	CIFDP PSG, WMO Secretariat	Continuous until 2013
4.3.10	To discuss on the data availability issue in the national/regional level (e.g. bathymetry) among the CIFDP stakeholders	CIFDP PSG, National Coordination Teams	December 2011 (stakeholders workshop)

Para	Action	By whom	When/target
4.4.3 3.2.25	To review and provide input to a Zero Order draft of the GFCS Implementation Plan (particularly, potential new strategic direction of including technical coordination for operational seasonal forecasting systems)	Co-president, MAN	February 2012
4.5.2	To continue efforts for initiative in collaboration with the ITU and WMO, to identify ocean / climate / disaster warning needs	David Meldrum	continuous
4.6.1, 4.6.2	To revise the current version of the JCOMM Capacity-Building Principles	Activity Leader on CB, Secretariat	ASAP
4.6.4	To initiate a survey, possibly jointly with IODE, on the training requirements/need for qualification and competency of national marine forecasters	Activity Leader on CB	ASAP and before November 2011
4.6.5	To enhance and/or ensure appropriate links with the WMO/ETR and IODE/OceanTeacher for JCOMM training activities	Activity Leader on CB	continuous
5.1.2	To discuss on and prepare response to the proposed change in name/ToR for ETWS, into “Expert Team on Coastal Hazards Forecasting System (ETCH) “	SCG/ETWS	November 2011 (by SCG-VI)
5.2.3	to set a plan to secure positions of vice-chair in each CG and explore suitable candidates, to ensure succession plans for key posts	All PA Coordinators and Team/Group chairs	May 2012 (JCOMM-IV)
5.4.1	To review and revise the JCOMM Strategy and Operating Plan	Co-President, PA Coordinators, Eric Lindstrom	November 2011 (report to JCOMM-IV)
6.2.2	To ensure schedule and quality of JCOMM-IV documentation (particularly DOCs)	Co-President, PA Coordinators, Activity Leaders, Secretariat	December 2011 (report to JCOMM-IV)
6.2.3	To make necessary arrangement for the Keynote lecture at Opening (Dr. Won-Tae Kwon) and the George Needler memorial lecture (Dr Neville Smith)	Secretariat	ASAP
6.2.4	To finalize the arrangement for JCOMM Certificates of Outstanding Service	Secretariat	March 2012
6.2.8	To work on the preparation of the Scientific and Technical Conference	David Meldrum, Seung-Hyup You	May 2012

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Annex XIV

ACRONYMS AND OTHER ABBREVIATIONS

AMOCs	Area Meteorological and Oceanographic Coordinators
CAeM	WMO Commission for Aeronautical Meteorology
CAgM	WMO Commission for Agrometeorology
CB	Capacity Building
CBS	Commission for Basic Systems (WMO)
CCl	WMO Commission for Climatology
CDS	Marine Climate Data System
CHy	WMO Commission for Hydrology
CIFDP	JCOMM/CHy Coastal Inundation Forecasting Demonstration Project
CIMO	Commission for Instruments and Methods of Observation
DCPC	Data Collecting and Production Centre
DMCG	Data Management Coordination Group (JCOMM)
DMPA	Data Management Programme Area
DNA	Definitive National Agreement
DRR	Disaster Risk Reduction
ECV	Essential Climate Variables
EOVs	Essential Ocean Variables
ESA	European Space Agency
ETCH	Expert Team on Coastal Hazards Forecasting System
ETDMP	IODE/JCOMM Expert Team on Data Management Practices
ET-EGOS	CBS Expert Team on the Evolution of the Global Observing System
ETMAES	Expert Team on Marine Accident Emergency Support
ETMC	Expert Team on Marine Climatology (DMPA)
ETMSS	Expert Team on Maritime Safety Services
ETOOFS	Expert Team on Operational Ocean Forecast System (SPA)
ETRP	WMO Education and Training Programme
ETWS	Expert Team on Wind Waves and Storm Surges
FOO	Framework for Ocean Observations
GCOS	Global Climate Observing System
GCOS-IP	Global Climate Observing System Implementation Plan
GCW	Global Cryosphere Watch
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GFCS	Global Framework for Climate Services
GHRSST	Group for High Resolution Sea Surface Temperature
GLOSS	Global Sea Level Observing System
GMDSS	Global Maritime Distress and Safety System
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GSC	GOOS Steering Committee
GTS	Global Telecommunication System (WWW)
ICSU	International Council for Science
IHO	International Hydrographic Organization
IODE	IOC International Oceanographic Data and Information Exchange
JCOMMOPS	JCOMM *in situ* Observing Platform Support Centre
KMA	Korea Meteorological Administration
LDP	Light Data Provider
MCDS	Marine Climate Data System
MCSS	Marine Climate Summaries Scheme
MMMS	Marine Meteorological Monitoring Survey
MPERSS	Marine Pollution Emergency Response Support System
MSI	Maritime Safety Information

NCT	National Coordination Team
NEAMTWS	North-East Atlantic and Mediterranean Tsunami Warning System
NMHS	National Meteorological and Hydrological Service
OCG	Observations Coordination Group (JCOMM)
ODP	Ocean Data Portal
OO CoP	GEO Ocean Observations Community of Practice
OPA	Observations Programme Area
OPA-IG	JCOMM OPA Implementation Goals
PAs	Programme Areas
PANGEA	Partnerships for New GEOSS Applications
PICO	Panel for Integrated Coastal Observing
PMOs	Port Meteorological Offices
PSG	Project Steering Group
QMF	Quality Management Framework
RMICs	Regional Marine Instrument Centres
RRR	WMO Rolling Review of Requirements
SAR	search and rescue
SFSPA	Services and Forecasting Systems Programme Area
SoG	Statement of Guidance
SOLAS	International Convention for the Safety of Life at Sea
SSS	Sea Surface Salinity
SST	Sea-Surface Temperature
SSWS	Storm Surge Watch Scheme
SVW	Surface Vector Wind
SWFDP	Severe Weather Forecasting Demonstration Project
TCP	Tropical Cyclone Programme
TOWS-WG	The IOC Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems
TT-SAT	JCOMM Task Team on Satellite Data Requirements
WCRP	World Climate Research Programme (WMO/IOC/ICSU)
WDCs	World Data Centres
WDS	Weather and Disaster Risk Reduction Services Department
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO-No. 471	WMO Guide to Marine Meteorological Services
WMO-No. 558	WMO Manual on Marine Meteorological Services