

**SERVICES AND FORECAST SYSTEMS
PROGRAMME AREA COORDINATION GROUP
SIXTH SESSION**

Seoul, Republic of Korea, 8-11 November 2011

FINAL REPORT

JCOMM Meeting Report No. 89

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NOTES

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In the case of a recommendation made by a working group between sessions of the responsible constituent body, either in a session of a working group or by correspondence, the president of the body may, as an exceptional measure, approve the recommendation on behalf of the constituent body when the matter is, in his opinion, urgent, and does not appear to imply new obligations for Members. He may then submit this recommendation for adoption by the Executive Council or to the President of the Organization for action in accordance with Regulation 9(5).

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1 OPENING OF THE SESSION

1.1 Opening

1.1.1 The sixth session of the Services and Forecast Systems Programme Area (SFSPA) Coordination Group (SCG) of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was opened by the Systems Programme Area (SPA) coordinator, Dr Ming Ji, at 0900 hrs on Tuesday 8 November 2011, in the conference room of the Lexington Hotel, Seoul, Republic of Korea. Dr Ji welcomed participants to the session, and expressed his sincere appreciation to the Korea Ocean Research and Development Institute (KORDI) and Dr Moon-Sik Suk for hosting the meeting.

1.1.2 Dr Ji noted that the focus during this session was to prepare for the 4th Session of JCOMM (JCOMM-IV, 23-31 May 2012, Yeosu, Republic of Korea), in particular, to document the achievements and future priorities of the Programme Area (PA). All members of the Group agreed to restrict the discussion to key issues and those decisions required to facilitate the work for the next intersessional period, and focus on finalizing the SFSPA workplans and associated documentation for JCOMM-IV.

1.1.3 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 Group adopted its agenda for the session based on the provisional agenda that had been prepared by the Secretariat. This agenda is provided in *Annex II* to this report.

1.3 Working arrangements

1.3.1 The Group agreed its hours of work and other practical arrangements for the session.

2 GUIDANCE AND REQUIREMENTS FROM THE GOVERNING BODIES AND JCOMM MANAGEMENT COMMITTEE

2.1 Guidance and requirements from WMO Congress and IOC Assembly – impacts on Services Programme Area priorities and workplan

2.1.1 The Group noted that the IOC Assembly at its 26th session (June 2011, Paris) congratulated JCOMM on its achievements. In the meantime, the Group took note of the Assembly's remark encouraging JCOMM's stronger engagement with IOC's High Level Objectives, such as issues in coastal zones and disaster warning and mitigation, to better represent IOC's requirements of JCOMM.

2.1.2 The Group then heard that the 16th Session of the World Meteorological Congress (May-June 2011) had reaffirmed the success of a jointly sponsored technical commission in bringing together the marine meteorological and oceanographic communities. The Group noted WMO Resolution 24 (Cg-XVI) on the Marine Meteorology and Oceanography Programme, including the following decisions:

- detailed planning and implementation of the Marine Meteorology and Oceanography Programme should form an integral part of the WMO Strategic Plan, and assist Members to arrange for enhanced services provision, including new operational ocean forecast and warning systems to be developed in close coordination with users;

- the WMO Marine Meteorology and Oceanography Programme, advised and implemented through JCOMM, should be strengthened and expanded to address new emerging challenges and issues, especially on Disaster Risk Reduction, Coastal Management and Climate Services;
- additional funding should be sought for high-priority and emerging activities in the areas of training, capacity building and support for Least Developed Countries and Small Island Developing States; and
- the WMO Strategy for Service Delivery should guide the implementation of the Marine Meteorology and Oceanography Programme.

2.2 Outcomes of the actions arising from the JCOMM Management Committee

2.2.1 The Group reviewed the actions arising from the ninth session of the JCOMM Management Committee (MAN-IX, Geneva, Switzerland, September 2011) related or relevant to the SFSPA. The Management 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, and therefore agreed that retaining the current structure of the Commission should be proposed at JCOMM-IV to continue during the next intersessional period. Therefore, the PA Coordinators and the chairs of Teams/Groups, including the Group members, were requested to consider retaining their positions for the next intersessional period, and to explore any procedures that might in consequence be necessary according to national and WMO-IOC regulations (**Recommendation**). The Group also recommended that, following the practice during the current intersessional period, each Team should consider assigning specific activity/responsibility to each member taking into account the new requests and requirements given for the next intersessional period (**Recommendation**). The Group also noted the decision at MAN-IX that each Team should name a Vice-chairperson in order to ensure a succession plan and to share responsibilities during the intersessional period (**Action**).

2.2.2 The Group noted a suggestion by MAN-IX that the Expert Team on Wind Waves and Storm Surges (ETWS) be renamed to take into account the increasing requirement to address coastal hazard forecasting issues, primarily associated with storm surges, while continuing to carry out its current work regarding the global coordination for waves and storm surges. The Group proposed that ETWS should be re-named as the Expert Team on Waves and Coastal Hazards Forecast Systems (ETWCH), with draft Terms of Reference (ToR) as reproduced in *Annex III*. The Group requested the ETWS Chair and the Secretariat to finalize the Terms of Reference and a Draft Resolution on SFSPA for JCOMM-IV, and circulate it for review (**Action**).

2.2.3 The Group reviewed guidance and requests by MAN-IX under respective agenda items 3 to 6, and agreed on its actions accordingly.

3 REVIEW OF THE SFSPA WORKPLAN FOR THE CURRENT INTERSESSIONAL PERIOD

3.1 The Group recalled the major thrust areas for the SFSPA during the current intersessional period, including:

- To ensure maritime weather and sea ice safety including the operational implementation of five new Arctic Ocean METAREAs by July 2011;
- To implement operational ocean forecasting capability, initially by developing a Guide for Operational Ocean Forecasting; and
- To reduce the impact of weather hazards on coastal communities in response to the expected consequences of global climate change and sea level rise by implementing recommendations from the first JCOMM Storm Surge Symposium.

3.2 The Group reviewed the status of the SFSPA workplan / priority projects, in order to define the actions and plans for next intersessional period. Detailed information on each priority project is available at <http://www.jcomm.info/SPAWP>. The Group noted with satisfaction that many SFSPA projects had been successfully completed or have made significant progress, although the intersessional period between JCOMM-III and JCOMM-IV had been unusually short. Regarding the remaining actions and ongoing activities, the Group agreed to continue its effort through the next intersessional period **(Action)**.

3.3 The Group agreed to prepare a background document for JCOMM-IV in order to provide a detailed report on the achievements of SFSPA, adding to a formal SFSPA document describing significant achievements of the Programme Area (PA) **(Action)**.

4 DISCUSSION ON PRIORITY ISSUES IN OCEAN/MARINE SERVICES

4.1 Global Framework for Climate Services (GFCS)

4.1.1 The Group noted that implementation of a Global Framework for Climate Services (GFCS) had been identified as a top priority of the WMO at its 16th Congress in 2011. A GFCS Office had 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 that would be needed to support the development of the GFCS draft implementation plan and to prepare the Extraordinary Session of the World Meteorological Congress in the last quarter of 2012.

4.1.2 The Group took note of the decision at MAN-IX regarding the JCOMM input to the GFCS Implementation Plan, currently being developed. The Executive Council (of WMO) Task Team on GFCS would circulate for review and comments a Zero Order draft of the Implementation Plan, including the governance aspects, by mid-February 2012. A First Order Draft for submission to WMO Executive Council would then 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. JCOMM as a Technical Commission had been requested to provide input to and be engaged in the drafting process. The Group was requested to work with the Co-President and provide input to the process as appropriate **(Action)**.

4.1.3 The Group noted that the SFSPA had a number of core mandate areas that directly supported GFCS, including the following areas/activities:

- Polar metocean and sea ice information services, through activities by the Expert Team on Maritime Safety Services (ETMSS), the Expert Team on Sea Ice (ETSI) and the WMO Global Digital Sea Ice Database (GDSIDB) Project;
- Reducing coastal natural hazard impacts, through demonstration and capacity building in storm surge and coastal inundation forecasting, including Expert Team on Wind Waves and Storm Surges (ETWS) activities for the JCOMM-CHy Coastal Inundation Forecasting Demonstration Project (CIFDP), wave climate project and storm surge climatology;
- Ocean observations and modelling in support of coupled seasonal climate forecasting systems, coordination by the Expert Team on Operational Ocean Forecast System (ETOOFS).

4.1.4 The Group noted that the SFSPA should play a role not only to facilitate engagement of and interaction with user groups and other JCOMM entities that are interested in climate services, but also to provide scientific and technical input to the proposed Climate Services Information System.

4.1.5 The Group noted that the proposed GFCS would call for collaborative efforts by all PAs within JCOMM. For example, the International Workshop on Climate and Oceanic Fisheries (October 2011, Rarotonga, Cook Islands) had identified potential JCOMM contributions to GFCS for the metocean and fishery communities, through the coordination of improved climate monitoring and modelling, as well as in providing reliable ocean climate datasets and metocean data standards. The Group also agreed that partner organizations, including IOC, should be closely involved in the ongoing process of identifying user requirements relevant to JCOMM. It therefore asked the IOC Secretariat to work closely with the WMO Secretariat to ensure that an adequate dialogue would take place **(Action)**.

4.1.6 The Group agreed on a draft input to a document for JCOMM-IV on GFCS based on the discussion described above, and requested the Secretariat to finalize it for review **(Action)**.

4.2 Maritime Safety Services (MSS)

4.2.1 Following the relevant discussion under agenda item 3, the Group reviewed the progress report to JCOMM-IV including the intersessional workplan for maritime safety issues. The Group took note of the following major achievements and workplan/recommendations for the next intersessional period:

- Implementation of the WMO component of the Global Maritime Distress and Safety System (GMDSS) in the Arctic Ocean with full operational capacity in July 2011;
- Introduction of the International Maritime Organization (IMO)/WMO World-Wide Met-Ocean Information and Warning System (WWMIWS);
- Update and maintenance of WMO standards relating to sea ice;
- Quality Management for Maritime Safety Information (MSI). Recalling that International Organization for Standardization (ISO) practices or certificates, that, though not yet mandatory, might be required in the future by bodies in charge of the coordination of international systems, the Group considered that Members / Member States should include the provision of Maritime Safety Services in their Quality Management System (QMS) once implemented **(Recommendation)**. The Group agreed that ETMSS should coordinate annual self-assessment of all Issuing Services / METAREA Co-ordinators using the template used during the current intersessional period **(Action)**;
- Continuous update of the GMDSS-Weather website with updated MSI by Members / Member States;
- Provision of graphical products for mariners, as a set of Intergovernmental Hydrographic Organization (IHO) S-1xx formats. In order to address the potential increase in transmission costs, the ETMSS agreed to explore possibilities of issuing MSI in a text format that could be interpreted and be displayed by Electronic Navigational Charts (ENC) systems **(Action)**.

4.2.2 The Group noted that an updated version of the Manual on Marine Meteorological Services (WMO-No. 558) is being published in November 2011, and that the Guide on Marine Meteorological Services (WMO-No. 471) is also to be updated before JCOMM-IV. The ETMSS proposed several additional changes to these publications including: 1) the provision of sea ice information; 2) the availability of MSI prepared for the GMDSS on the Global Telecommunication System (GTS); 3) simplification of the Volume II (Regional Aspects) consistent with WMO Regional Association Operating Plans; and 4) modifications related to the new WWMIWS. It was agreed that the SFSPA Expert Teams, Expert Team on Marine Climatology (ETMC) and the Secretariat prepare a Draft Recommendation for JCOMM-IV on the amendment of these publications **(Action)**.

4.2.3 The Group recalled the discussion at MAN-IX on JCOMM's role in Marine Environmental Accident Responses. The recent nuclear accident at Fukushima had proved that the current coordination system for the Marine Pollution Emergency Response Support System (MPERSS) suffered from a capability and service gap with regard to its ability to respond to marine environmental incidents such as radioactive material discharges. The Group therefore reviewed and updated the outline for a JCOMM strategy on developing its work related to a wider range of marine pollution emergencies, as reproduced in Annex IV, and agreed to submit it to JCOMM-IV for consideration and endorsement by Members / Member States **(Action)**. Through this draft Strategy, the Group emphasized that JCOMM should make focused efforts to enhance the technical capability for forecasting radioactive material dispersion, and to ensure that this new capability would have benefits for other applications within Marine Accident Emergency Support (MAES).

4.2.4 For the next intersessional period, the Group agreed that ETMSS should: 1) lead setting/streamlining a procedure to provide metocean products and services in collaboration with other Organizations such as the IMO, IHO & the International Atomic Energy Agency (IAEA); 2) review the MPERSS in the light of METAREA coordination and the Regional Specialized Meteorological Centres (RSMCs) responsible for long-range pollutant transportation in the atmosphere, and 3) identify ways to improve MAES implementation at national, regional, and global levels. For its part, ETOOFS should: 1) review and re-define needs and requirements, including essential metocean information for relevant applications; 2) catalogue / document currently available tools for MAES support (e.g. models), and 3) identify gaps (particularly regional gaps) in cooperation with other competent bodies.

4.2.5 The Group agreed on a draft input to a document for JCOMM-IV on MSS based on the discussion described above, and requested the Secretariat to finalize it for review **(Action)**.

4.3 Coastal Hazard Forecasting

4.3.1 Following the discussion under agenda item 3, the Group reviewed its progress report to JCOMM-IV, including the intersessional workplan on coastal hazard forecasting. The Group noted the increasing requirements by Members / Member States for JCOMM coordination/support in developing and improving forecast capabilities and service delivery in coastal risk reduction, as well as the emerging importance of coastal zones within climate services. The Group therefore welcomed the direction of the Management Committee to identify activities related to marine and coastal hazards as a priority during the next intersessional period, through the leading activities of the Expert Team on Wind Waves and Storm Surges (ETWS) for scientific and technical support for coastal hazard forecasting and warning services. The Group took note of the following major achievements and workplan/recommendations for the next intersessional period:

- To develop a white paper on complex sea states, and to propose a guideline on MSI **(Action)**. The ETWS and ETMSS would carry out these tasks during the intersessional period and thereafter, with a view to amending the WMO Manual on Marine Meteorological Services (WMO-No. 558) as well as the Catalogue on MetOcean Object Classes and Attributes;
- Publication of the “Guide to Storm Surge Forecasting” (WMO-No.1076) and its dynamic part;
- The ETWS-ETMC collaborative initiative to develop and maintain an Extreme Wave Dataset, as well as the ETWS effort to coordinate the development of storm surge climatologies by Members/Member States.

4.3.2 In the same context as paragraph 2.1.1, the Group took note of the recommendation by the Management Committee on cooperation between JCOMM and the IOC Integrated Coastal Area management (ICAM) programme and the tsunami and sea level programmes, and recommended to strengthen the joint activities during the next intersessional period

(Recommendation). The Group agreed to review the “Prioritized Action Plan for Implementation of the Coastal Module of GOOS” (<http://ioc-goos.org/index.php?option=comoe&task=viewDocumentRecord&docID=7702&lang=en>) that had recently been compiled by the Global Ocean Observing System (GOOS) Panel for Integrated Coastal Observing (PICO), which had just been published, with a view to articulating JCOMM support for delivery of services in the coastal zone, in particular related to coastal hazards **(Action)**.

4.3.3 The Group also noted the request by MAN-IX to extend an invitation from JCOMM to the working groups and/or task teams of the Intergovernmental Coordination Groups of Tsunami Early Warning and Mitigation Systems (ICG-TEWS). The Group suggested identifying collaborative activities between ETWS and the IOC Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG), as the first step **(Recommendation)**.

4.3.4 The Group was informed of recent developments in the implementation of the JCOMM-CHy Coastal Inundation Forecasting Demonstration Project (CIFDP, <http://www.jcomm.info/CIFDP>), and took note of the CIFDP strategy, as follows:

- The project would be implemented under each regional/national sub-project, launched only for countries that meet the essential requirements for initiating a national agreement between national institutions with relevant responsibilities, and the provisional establishment of a National Coordination Team (NCT) that included operator(s) of the NMHS;
- The project would be built based on users’ perspectives and requirements, considering only existing and available open source techniques. Final products of the Demonstration Project should be operated and maintained by a national operational agency which had the responsibility/authority for storm surge warning and flood warning;
- The developed procedure / best practice should be applicable to other (neighbouring) countries with common issues and interests, should be closely linked with related projects and activities such as the regional Severe Weather Forecasting Demonstration Project (SWFDP) in building a “cascading forecasting process” to develop services for coastal zones.

4.3.5 The Group noted that two CIFDP sub-projects were being initiated under the guidance of the Project Steering Group (PSG) in which the ETWS members were taking a leading role. The Group agreed that the established procedure that was emerging should be documented as guidance for Members / Member States as soon as the Project became mature **(Recommendation)**.

4.3.6 The Group agreed on draft input to a document for JCOMM-IV on this issue based on the discussion described above, and requested the Secretariat to finalize it for review **(Action)**.

4.4 Ocean Forecasting Systems

4.4.1 Following the discussion under agenda item 3, the Group reviewed the progress report to JCOMM-IV including the intersessional workplan for this topic. Noting that operational ocean forecasting would remain a priority of JCOMM for the intersessional period, the Group agreed that the ETOOFS should continue close collaboration with the Global Ocean Data Assimilation Experiment (GODAE) OceanView (GOV) in planning and implementing the work of JCOMM in this area. The Group took note of the following major achievements and workplan/recommendations for the next intersessional period:

- Developing a Guide to Operational Ocean Forecasting Systems;

- Routine monitoring of operational quality control systems for operational ocean forecasting;
- Coordination of an extension of capability to fill the gap identified following the recent Fukushima nuclear accident, in collaboration with ETMSS (see item 4.2).

4.4.2 Following the discussion under agenda item 4.1 on JCOMM contributions to GFCS, it was agreed that the ETOOFS should work with other relevant international groups (e.g. Working Group on Numerical Experimentation (WGNE), GODAE Ocean View Science Team (GOVST)) and the seasonal climate forecasting community to develop a coordination framework for operational coupled seasonal climate forecast systems (**Action**). The focus of the JCOMM contribution should be the ocean component. ETOOFS would identify the best approach for the coordination of seasonal climate forecasting and in particular prepare a recommendation specifying the role required from JCOMM, in particular, to facilitate the implementation of the approved recommendation.

4.4.3 The Group agreed on draft input to a document for JCOMM-IV on this issue based on the discussion described above, and requested the Secretariat to finalize it for review (**Action**).

4.5 Quality Management and Capacity building

4.5.1 The Group welcomed the successful conduct of the JCOMM Pilot Project for Quality Management (QM) of Marine Weather and Ocean Service that had been conducted by the Australian Bureau of Meteorology. Taking note of the case of the WMO Commission for Aeronautical Meteorology (CAeM) that had successfully led the Quality Management Framework (QMF)/QMS application in the associated services, the Group recommended that the National Meteorological and Hydrological Services (NMHSs) could apply the developed framework of practice described in the new Practical Guide for the Implementation of Quality Management System for NMHSs (see paragraph 4.2.1). In doing so, it was recommended that the interested Members / Member States could develop Demonstration Projects during the next intersessional period in the QM exercise for marine/oceanographic services. The Group agreed that ETMSS should consult with Members / Member States to initiate (a) pilot project(s) accordingly (**Action**).

4.5.2 The Group took note of the discussion at MAN-IX on the general direction and principles that should be kept for the next intersessional period, as following:

- Preparation and management of technical guidance material, in conjunction with the regular review and update of the Guides and Manuals;
- Development of a web-based tool to document/consolidate/visualize overall JCOMM Capacity Building (CB) activities, particularly those initiated and directly supported by the Members / Member States. As a first draft, a consolidated list of JCOMM CB activities was now published on the JCOMM website: <http://www.jcomm.info/CB>;
- Enhanced support for time-bound projects with clear objectives and plans for delivery, which support Members' / Member States' capacity development and technology transfer (e.g. Coastal Inundation Forecasting Demonstration Project: CIFDP);
- Strengthened liaison and contacts with the wider WMO-IOC capacity development programmes, through an active membership of the Management Committee 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.

4.5.3 Following the discussion under agenda item 3, the Group reviewed the Capacity Building progress/activity report and the proposed future workplan. Among a number of CB plans, the Group noted the following hands-on training plans in particular:

- Capacity building for the development of operational ocean forecast systems. ETOOFS would provide a supporting role to planned workshops during the next intersessional period, including a planned GODAE summer school and operational ocean forecasting training jointly organized by the Data Buoy Cooperation Panel (DBCP) and the Indian Ocean Global Ocean Observing System (IOGOOS).
- Continuous support for training on wave and storm surge forecasting. In particular, noting that the South and East African coast suffers from recurrent coastal inundation by storm surges, it was suggested that the 8th JCOMM- Tropical Cyclone Programme (TCP) training workshop on wave and storm surge forecasting would be held in Kenya, for East African /West Indian Ocean countries;
- Continuous support for the Ice Analysts Workshops, as a successful platform for training, exchange of experience and organization of services (including GMDSS) in Polar Regions.

5 PREPARATIONS FOR JCOMM-IV

5.1 Proposed SPA work plan for the next intersessional period

5.1.1 The Group reviewed and revised the SFSPA priority and workplan for the upcoming intersessional period (2012-2017) as well as emerging opportunities, as presented in *Annex V*. The Group requested the PA Coordinator and the ET Chairs to finalize the document and submit it to JCOMM-IV **(Action)**. The Group also requested the Secretariat to update the SFSPA web page (<http://www.jcomm.info/SFSPA>) with the workplan for new intersessional period **(Action)**.

Rolling Review of Requirements (RRR) and Statement of Guidance (SoG)

5.1.2 The Group agreed the importance of an integrated approach between in situ and satellite observations when considering the overall requirements of JCOMM. The Group noted with appreciation that the WMO-CEOS database (<http://www.wmo-sat.info/db/>) now contained a new sub-set relevant to marine meteorology and operational oceanography, allowing an accurate assessment of how the existing in situ and satellite ocean observing systems were addressing JCOMM's own service requirements for such data. The Group agreed to ensure that the set of observational data requirements to support met-ocean applications and SoG continue to be reviewed **(Action)**.

5.1.3 The Group noted a request by MAN-IX for a general document to be taken to the higher JCOMM level for consideration by Members / Member States including the Space Agencies, to address broader requirements for satellite information. Mr Ali Mafimbo, the SCG Vice-Chair and JCOMM focal point for the Rolling Review of Requirements (RRR), worked with the Group members to draft such a document as reproduced in *Annex VI*. The revised documents would be submitted to JCOMM-IV for endorsement by the higher level and the wider community. The Group agreed to finalize this document and submit it to the Co-President and Secretariat **(Action)**.

5.2 Documentation for JCOMM-IV

5.2.1 The Group was informed that documents for JCOMM-IV relevant to SFSPA consist of a single document on the activities carried out during the preceding intersessional period and workplan for the next intersessional period (JCOMM-IV/Doc.8), and various documents on priorities issues (JCOMM-IV/Doc.8.X) concentrating on decisions expected to be made during JCOMM-IV. The Group also noted that the detailed report on the achievements and plans could be included in a background document (JCOMM-IV/Bak.8), which would be submitted to JCOMM-IV in English only.

5.2.2 The Group noted that draft text in the session documents (JCOMM-IV/Doc.X.X) must lead to a decision, implementation action, request for a new action or adoption of a Resolution. In this context, the Group was requested to work with the Secretariats to ensure that all the session documents would follow the guidelines **(Action)**.

5.3 Draft Resolution/Recommendations for JCOMM-IV

5.3.1 The Group agreed on the formal recommendations to propose to JCOMM-IV, as follows:

[Draft Resolution]

- Services and Forecast Systems Programme Area (with a proposed ToR for ETWCH)

[Draft Recommendations]

- Enhancement of capability for marine environmental emergencies
- Amendment to the WMO Technical Regulations, including WMO-No.558
- Amendment to the WMO Technical Regulations, including WMO-No.471

6 ANY OTHER BUSINESS

6.1 The Group noted a plan to hold a two-day Scientific and Technical Workshop during JCOMM-IV, on 24 and 25 May 2012. The Group, with Dr Sung Hyup You representing the local organizer, reviewed a draft format for the Workshop, taking into account that the Workshop should be an opportunity not only to review the *status quo* but to consider what science and technology would be important over the years to come. The Group agreed on the draft timetable for the Workshop as reproduced in *Annex VII*, and agreed that this offered sufficient flexibility for a varied programme of keynote addresses, presentations and posters.

6.2 The Group noted that the IEEE OCEANS-12 conference would run immediately prior to the Workshop, and urged Mr Meldrum and Dr You to engage proactively with this community to ensure a suitable cross-fertilization of ideas, applications and presentations **(Action)**. The Group concluded by asking the co-organisers to proceed with soliciting self-funded presentations from as wide a community as possible, with a view to arriving at a balanced and stimulating programme **(Action)**.

7 CLOSURE OF THE SESSION

7.1 Adoption of the list of action

7.1.1 At 11/11/11, 1111 hours, the Group reviewed and approved the draft final report, including actions and recommendations raised from the meeting.

7.2 Closure

7.2.1 In closing the meeting, the SFSPA coordinator, Dr Ming Ji, expressed his appreciation to all participants for their devoted efforts in implementing the intersessional workplan and projects and the very positive and valuable input to the discussions during the session, all of which had enabled substantial progress in preparation for JCOMM-IV. On behalf of the Group, Dr Ji expressed his sincere thanks to the host of this Session, Dr Moon-Sik Suk and KORDI, for excellent support and arrangement of the meeting.

7.2.2 The sixth session of the Services and Forecast Systems Programme Area Coordination Group (SCG-VI) closed at 1245 hours on Friday 11 November 2011.

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AGENDA

1 Organization of the session

- 1.1 Opening
- 1.2 Adoption of the agenda
- 1.3 Working Arrangements

2 Guidance and requirements from the Governing Bodies and JCOMM Management Committee

- 2.1 Guidance and requirements from WMO Congress and IOC Assembly – impacts on Services Programme Area priorities and work plan
- 2.2 Outcomes of the actions arising from the JCOMM Management Committee

3 Review of the SFSPA Workplan for the current intersessional period

4 Discussion on priority issues in Ocean/Marine services

- 4.1 Global Framework for Climate Services (GFCS)
- 4.2 Maritime Safety Services (MSS)
- 4.3 Coastal Hazard Forecasting
- 4.4 Ocean Forecasting Systems
- 4.5 Quality Management and Capacity building

5 Preparations for JCOMM-IV

- 5.1 Proposed SPA work plan for the next intersessional period
- 5.2 Documentation for JCOMM-IV
- 5.3 Draft Resolution/Recommendations for JCOMM-IV

6 Any Other Business (AOB)

7 Closure of the session

- 7.1 Adoption of the list of action
 - 7.2 Closure
-

**DRAFT TERMS OF REFERENCE FOR
EXPERT TEAM ON WAVES AND COASTAL HAZARDS FORECAST SYSTEMS**

The Expert Team on Waves and Coastal Hazards (ETWCH) shall:

- (a) Provide advice to Members/Member States on the development of real time operational forecast capability for wind waves and storm surge, as part of marine multi-hazard warning systems, to enhance their capacities to issue more accurate, consistent and timely operational forecast products;
- (b) Develop a component of the Global Framework for Climate Services for coastal inundation forecasting and warning, through relevant demonstration projects as well as through continuous work to establish a storm surge climatology by coordinating relevant activities of Members/Member States
- (c) Develop technical advice and guidance material on wind wave and storm surge modelling, forecasting and service provision as part of marine multi-hazard warning systems, including coastal inundation modelling, forecasting and risk assessment, and provide assistance and support to Members/Member States as required;
- (d) Provide advice to Members/Member States on the development of capability to provide marine multi-hazard warning services, with special attention to least developed countries and small island developing States, through capacity-building activities;
- (e) Ensure effective coordination and cooperation with other WMO and appropriate Global Ocean Observing System bodies, particularly on requirements for, and implementation of, wind wave and storm surge data, products and services.

As a general principle, these terms of reference will be implemented through specific, defined, time-limited projects.

General membership

The membership will consist of a core membership of up to eight members, representing the subject areas of waves, storm surges, and inundation forecasting, including the chairperson and vice-chair, selected to ensure an appropriate range of expertise in all areas.

Additional experts may be invited as appropriate, representative of a range of activities related to wind waves, storm surges and coastal marine hazards, including coastal inundation, on a self-funded basis, and in general with no resource implications to JCOMM.

**PROPOSED OUTLINE FOR
A STRATEGY FOR THE JCOMM ACTIVITIES
ON THE MARINE ENVIRONMENTAL EMERGENCIES**
(as adopted at JCOMM SCG-VI, November 2011)

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 (IAEA), 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)
- MPERSS

2 Emerging issues of marine environmental emergencies

- oil and other noxious substance spills
- accident related to objects (Search And Rescue: 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 Environmental Emergency Response

3.1 JCOMM Goals/objectives in this area:

- to support NMHS in developing/enhancing capacity to provide a consistent level of met/ocean information and drift information in the event of a range of marine environmental incidents, including;
 - spills of oil and other noxious substance
 - accidents related to objects (SAR)
 - Radioactive material discharges in marine and coastal zones
 - other marine environmental hazards (e.g. harmful algal blooms).
- to enhance the coordination for JCOMM's basic responsibility to support Marine Accident Emergency Support (MAES), through targeted activities during the intersessional period.

3.2 Strategy

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

3.3.2 Post-event analysis of the Fukushima accident identified a capability and service gap for the modelling of radioactive material discharge; in the light of this, there is

an opportunity for JCOMM to focus, during the next intersessional period, on enhancing the technical capability for forecasting support in marine & coastal zones.

- 3.3.3 The International Atomic Energy Agency (IAEA), the world's centre of cooperation in the nuclear field under the united nations framework, has initiated a Coordinated Research Project (CRP) for Benchmarking models for the Ocean Dispersion and Transfer of Radionuclides from the Tokyo Electric Power Company (TEPCO) Fukushima Nuclear Power Plant (NPP).
- 3.3.4 The CRP represents an opportunity for JCOMM to leverage existing expert teams and partner organisations to coordinate the development of this capability and the framework necessary to effectively deliver these services through the member states
- 3.3.5 Undertaking this initiative as a focus for JCOMM-IV will deplete resources for other MAES applications already established within JCOMM. The strategy must include maintenance of established capability.
- 3.3.6 Taking into account related international initiatives to develop dispersion modelling and forecasting capability such as the planning activity for the IAEA's CRP by USA/NOAA, Japan/JAMSTEC, France and others;
- 3.3.7 Establishing this new capability will have benefits for other applications within MAES, however during JCOMM-IV this should stay focused on the application for radioactive material discharge. It is anticipated that the outcome and developed capabilities could be adapted to other MAES related applications.
- 3.3.8 The respective task/responsibility of each Team (mainly in SFSPA) is agreed as following:

[Co-Presidents and MAN]

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

[ETMSS]

- continued coordination of the Marine Pollution Emergency Response Support System (MPERSS), including the update/streamlining of MAES-MPERSS Website (<http://www.maes-mperss.org>) with support by the Secretariat;
- review the role of the Area Meteorological and Oceanographic Coordinators (AMOCs) in support of marine pollution monitoring and response, marine SAR, and their applicability in the context of any response to radioactive material discharge;
- liaise with international organizations, in particular IAEA, on the requirements for the delivery of information in support of radioactive material discharge;
- to plan and support update of WMO-Nos. 471 and 558, and related training initiatives.

[ETOOFs]

- Take responsibility for coordination of extension of capability to fill the identified gap, in cooperation with GOV, IAEA and other partners;

- Liaise with ETMSS on the international coordination for meeting the service requirements.

3.3.9 The implementation of this strategy will be in parallel to and in collaboration with national and international initiatives. A small number of experts in MAES (e.g. Activity Leaders) should be appointed within the members of the responsible Teams (including ETOOFS and ETMSS). Their tasks will include coordinating and facilitating the identified initiatives of relevance, and set the Commission's workplan to support them. They will work directly with the Co-Presidents, SFSPA Coordinator and the Secretariat for the task.

Resource required:

- 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)
-

**SFSPA PRIORITY, WORKPLAN AND EMERGING OPPORTUNITIES
FOR THE UPCOMING INTERSESSIONAL PERIOD (2012-2017)**
(as adopted at JCOMM SCG-VI, November 2011)

SFSPA Priority for Intersessional Period (2012-2017)

Supporting the implementation of the Global Framework for Climate Services (GFCS) for marine and coastal community, through:

- Maintain and extend maritime weather and sea ice safety services, including the enhanced coordination for marine pollution emergency responses;
- Reduce risks of meteorological and oceanographic hazards in coastal zones, by implementing recommendations from the first JCOMM storm surge symposium and supporting research effort for marine climate projection;
- Implement operational ocean forecasting capability including operational coupled seasonal climate forecast systems, and develop technical guidance material.

SFSPA Work Plan (2012-2017)

Safety-related Marine Meteorological Services

- Continue supporting Maritime Safety Information services (with IMO and IHO) including ice navigation services and information on complex sea states; and develop ENC/ECDIS displaying capability for met-ocean objects
- Maintain and update technical documentation, including the Manual on Marine Meteorological Services (WMO-No. 558), Guide on Marine Meteorological Services (WMO-No.471), relevant parts of the Global Data Processing and Forecasting System (GDPFS, WMO-NO. 485) and sea-ice standards and manuals
- Develop and implement JCOMM Strategy for enhanced marine pollution emergency responses, with focus on radioactive material discharges
- Enhance interaction with marine users to keep abreast of user requirements and for improvement of services, and improve service / information interface

Support Disaster Risk Reduction in Coastal Zones

- Maintain and update technical documentation (and their dynamic parts), including the Guide to Storm Surge Forecasting (WMO-No.1076), Guide to Wave Analysis and Forecasting (WMO-NO.702), and relevant parts of the Global Data Processing and Forecasting System (GDPFS, WMO-NO. 485)
- Continue Supporting Members / Member States to develop and implement the regional sub-projects of the Coastal Inundation Forecasting Demonstration Project (CIFDP)
- Support Members / Member States in establishing Extreme Wave dataset and storm surge climatologies
- Extend cooperative activities with IOC Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG) for multi-hazard approach

- Lead research effort for coordinated wave climate projection (COWCLIP)

Operational Forecasting Systems and Services

- Develop technical documentation, particularly the new Guide to Operational Ocean Forecasting Systems
- Develop a coordination framework for operational coupled seasonal climate forecast systems
- Coordinate developing capability for radioactive material dispersion modelling
- Maintain and update requirement documents for ocean applications, including RRR and SoG
- Develop performance metrics for operational ocean forecasting
- Continue leading the wave forecast verification scheme (<http://www.jcomm.info/wave>), and support verification/evaluation activities through the Pilot Project on Wave Evaluation and Test (PP-WET, <http://www.jcomm.info/wet>)

Quality Management and Capacity Building

- Support Members / Member States to implement a Quality Management System (QMS) that includes the provision of Maritime Safety Service, through developing training material as well as providing appropriate trainings
- Support trainings for operational ocean forecasting
- Continue supporting Storm Surge Watch Scheme (SSWS) including train workshops on storm surge and wave forecasting (JCOMM/TCP training workshop series)

Emerging Programmatic Priorities and Opportunities

- Marine volcanic ashfall hazard advisory (Maritime Safety):
 - Severe Space Weather events (Maritime Safety):
 - Oceanic dispersion modelling (Operational Ocean Forecasting and Marine Emergency Response)
 - Advisory for regional and national forecast/warning systems for coastal meteorological / oceanographic hazards (Coastal Hazards Forecasting)
-

OPERATIONAL REQUIREMENTS AND WMO ROLLING REVIEW OF REQUIREMENTS

1. Ocean Applications are of global importance, serving a wide range of users from the open ocean to the near-shore, and embracing diverse activities such as shipping, fishing, resource exploitation, leisure, hazard warning and mitigation. To help prepare the analyses, forecasts and warnings needed by this user community, detailed knowledge is required of the present state of the ocean and the atmosphere. In other words, highly accurate and timely observations of metocean parameters are critical to those application areas that model and forecast the state of the ocean and atmosphere, including storm-surge and extreme wave prediction, in addition to ocean, meteorological and ice services.

2 A Statement of Guidance (SoG) has been developed, drawn from a consensus of the metocean modelling, forecasting and services communities, to document the observational requirements that underpin ocean applications, based on the JCOMM User Requirement Document. This SoG provides a brief discussion on how well the present and planned metocean observing systems meet the stated user requirements for metocean services.

3 The Statement, which both derives from and contributes to the WMO Rolling Review of Requirements (RRR), is reviewed at appropriate intervals by the JCOMM Services and Forecast Systems Programme Area Coordination Group, in order to ensure that it also remains consistent with the current state of the relevant science and technology, and that its aims are reasonable and achievable.

4 It is recognized that satellite data are the primary source of information for the global ocean, and are often the only reliable source where *in situ* observations are sparse or absent. While many variables can be derived from satellite observations, including sub-surface information, nonetheless *in situ* ocean observations are always required for ground truth and the validation of satellite algorithms and products. *In situ* data may also be the only reliable source of information during extreme events, and are invaluable in validating the numerical models that are the core of our predictive capability. Given that *in situ* observations are an essential complement to satellite observations, and it is therefore essential that both present and planned composite observing systems properly integrate both satellite and *in situ* components. This requires a close dialogue between both communities that has until now often been lacking. The composite systems of the future must also be fully documented and archived such that their data will continue to be freely of use for many decades, particularly in support of climate studies.

5. Furthermore, careful attention must be given to ensuring that an adequate and sustainable data communications infrastructure exists to meet the expanding requirements for environmental data that are implicit in both the SoG and the RRR.

**SCIENCE AND TECHNOLOGY WORKSHOP AT JCOMM-IV, YEOSU
IMPROVING MARINE AND OCEAN DATA AND PRODUCTS FOR SCIENCE AND SOCIETY: THE ROLE OF JCOMM**

Draft timetable

Thurs 24 May		Fri 25 May		Sat 26 May	
0900	Workshop opening: KMA host and chairs	0900	Present draft workshop statement	0900	Note: Local host plans excursions all day! Additional sessions and breakout groups as required
0920	Keynote address: Socio-economic benefits and impacts of ocean products and services	0920	Keynote address:		
	SESSION 1: Reducing uncertainty in ocean data and products		SESSION 3: Marine meteorological and ocean prediction, services, applications and user interfaces		
1000	Speaker 1	1000	Speaker 13		
1030	Speaker 2	1030	Speaker 14		
1100	Break	1100	Break	1100	Break
1130	Speaker 3	1130	Speaker 15		
1200	Speaker 4	1200	Speaker 16		
1230	Speaker 5	1230	Speaker 17		
1300	Lunch	1300	Lunch	1300	Close
	SESSION 2: Improved data accessibility and management as the link between observations and services		SESSION 4: JCOMM contribution to climate services		
1400	Speaker 6	1400	Speaker 18		
1430	Speaker 7	1430	Speaker 19		
1500	Speaker 8	1500	Speaker 20		
1530	Break	1530	Break		
1600	Speaker 9	1600	Speaker 21		
1630	Speaker 10	1630	Speaker 22		
1700	Speaker 11	1700	Speaker 23		
1730	Speaker 12	1730	Speaker 24		
1800	Close and poster session	1800	Close and finalise workshop statement		

LIST OF ACTIONS

Item	Action	By whom	When/target
2.2.1	To draft a Draft Resolution for each ET's membership, naming Vice-chairperson , to submit to JCOMM-IV	ET Chairs, Secretariat	ASAP
2.2.2	To finalize the ToR for a new ET on Wind Waves and Coastal Hazards Forecast Systems (ETWCH) and associated Draft Resolution for JCOMM-IV, and circulate them for review	Secretariat, ETWS Chair	Immediately
3.1.2	To continue working on the remaining actions and ongoing activities of the priority projects for each Teams	ETs / led by ET Chairs	Continuous
3.1.3	To finalize a detailed background document for JCOMM-IV on the achievements of SFSPA	ET Chairs / led by SFSPA Coordinator	ASAP
4.1.2	To provide input to a draft GFCS Implementation Plan	ET Chairs / led by SFSPA Coordinator	August 2012
4.1.5	To ensure adequate dialogue between IOC and WMO secretariat for the process of identifying user requirements relevant to JCOMM	Secretariats	Continuous
4.1.6	To finalize a draft for SFSPA input to JCOMM-IV document on GFCS	Secretariats	15 November
4.2.1	To coordinate annual self assessment of all Issuing Services / METAREA Co-ordinators on QMF/QMS implementation	ETMSS chair	Annual / Continuous
4.2.1, 4.2.2	To finalize a Draft Recommendations for JCOMM-IV on the amendment of WMO-No.558 and WMO-No.471	ETMSS, ETSI, ETMC Chairs	15 November
4.2.3	To finalize the outline for a Strategy for the JCOMM Activities on the MAES (Annex IV), to submit to JCOMM-IV	ETMSS Vice-Chair, ETOOFS Chair and Secretariat	ASAP
4.2.4	To finalize a JCOMM-IV document on MSS	Secretariats	15 November
4.3.1	To develop a white paper on complex sea states	ETWS and ETMSS / led by ETWS chair	JCOMM-IV (first draft) and thereafter
4.3.2	To review the Implementation Plan for coastal GOOS	ET Chairs	Continuous
4.3.6	To finalize a JCOMM-IV document on coastal hazards	Secretariats	15 November
4.4.2	To plan and work to develop a coordination framework for operational coupled seasonal climate forecast systems	ETOOFS	Continuous
4.4.3	To finalize a JCOMM-IV document on OFS	Secretariats	15 November
4.5.1	To identify and design a pilot project on QM application to maritime safety information services	ETMSS	Intersessional period
5.1.1	To finalize SFSPA priority and workplan	PA Coordinator and ET Chairs	15 November
5.1.1	To update the SFSPA website with a new workplan for next intersessional period	Secretariat	JCOMM-IV

Item	Action	By whom	When/target
5.1.2	To keep the RRR and SoG updated with the ocean applications requirements	ET Chairs and Coordinator / led by Ali Mafimbo	Continuous
5.1.3	To finalize a high level statement on ocean application requirements (focus on satellite product requirements)	Ali Mafimbo	ASAP
5.2.2	To ensure that the JCOMM-IV Documents will be consistent with the guidelines	PA Coordinator, ET Chairs and Secretariat	JCOMM-IV
6.2	To engage with the community linked to IEEE OCEANS-12 to ensure interaction in organizing the JCOMM-IV S&T Conference	David Meldrum, S.H.You	Until JCOMM-IV
6.2	To proceed with soliciting self-funded presentations at JCOMM-IV S&T Conference	PA Coordinator, ET Chairs and Secretariat	ASAP and until JCOMM-IV

ACRONYMS AND OTHER ABBREVIATIONS

AMOCs	Area Meteorological and Oceanographic Coordinators
CAeM	WMO Commission for Aeronautical Meteorology
CB	Capacity Building
CIFDP	JCOMM-CHy Coastal Inundation Forecasting Demonstration Project
CHy	WMO Commission for Hydrology
CRP	Coordinated Research Project
DBCP	Data Buoy Cooperation Panel
EMSA	European Maritime Safety Agency
ENC	Electronic Navigational Charts
ERA	WMO Emergency Response Activities
ET	Expert Team
ETMC	Expert Team on Marine Climatology
ETMSS	Expert Team on Maritime Safety Services
ETOOFS	Expert Team on Operational Ocean Forecast System
ETSI	Expert Team on Sea Ice
ETWCH	Expert Team on Waves and Coastal Hazards Forecast Systems
ETWS	Expert Team on Wind Waves and Storm Surges
GDSIDB	WMO Global Digital Sea Ice Database
GFCS	Global Framework for Climate Services
GFCS-IP	GFCS Implementation Plan
GMDSS	Global Maritime Distress and Safety System
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GOV	GODAE OceanView
GOVST	GODAE Ocean View Science Team
GTS	Global Telecommunication System
IAEA	International Atomic Energy Agency
ICAM	Integrated Coastal Area Management
ICG-TEWS	Intergovernmental Coordination Groups of Tsunami Early Warning and Mitigation System
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IOGOOS	Indian Ocean GOOS
JAMSTEC	Japan Agency for Marine-Earth Science and Technology
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
KORDI	Korea Ocean Research and Development Institute
MAES	Marine Accident Emergency Support
MAN	JCOMM Management Committee
MARPOL	International Convention for the Prevention of Pollution from Ships
MEPC	Marine Environment Protection
MESL	IAEA Marine Environmental Studies
METAREA	Meteorological Area
MPERSS	Marine Pollution Emergency Response Support System
MSC	Maritime Safety Committees
MSS	Maritime Safety Services
MSI	Maritime Safety Information
NCT	CIFDP National Coordination Team
NMHS	National Meteorological and Hydrological Service
NOAA	National Oceanic and Atmospheric Administration (USA)
NPP	Fukushima Nuclear Power Plant
OFS	Ocean Forecast System

PA	Programme Area
PICO	GOOS Panel for Integrated Coastal Observing
PSG	Project Steering Group
QM	Quality Management
QMF	WMO Quality Management Framework
QMS	Quality Management System
RRR	Rolling Review of Requirements
RSMCs	Regional Specialized Meteorological Centres
SAR	Search and Rescue
SCG	SFSPA Coordination Group
SFSPA	Services and Forecast Systems Programme Area
SoG	Statement of Guidance
SWFDP	Severe Weather Forecasting Demonstration Project
TCP	WMO Tropical Cyclone Programme
TEPCO	Tokyo Electric Power Company
ToR	Terms of Reference
TOWS-WG	IOC Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems
WGNE	Working Group on Numerical Experimentation
WMO-No. 471	Guide on Marine Meteorological Services
WMO-No. 558	Manual on Marine Meteorological Services
WMO-No.1076	Guide to Storm Surge Forecasting
WWMIWS	IMO/WMO World-Wide Met-Ocean Information and Warning System
