



JOINT WMO/IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY

**SERVICES AND FORECASTING SYSTEMS
PROGRAMME AREA COORDINATION GROUP
SEVENTH SESSION**

Tokyo, Japan, 4 – 6 March 2013

FINAL REPORT

WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC
COMMISSION (OF UNESCO)

**SERVICES AND FORECASTING SYSTEMS
PROGRAMME AREA COORDINATION GROUP
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JCOMM Meeting Report No. 101

NOTES

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1 OPENING OF THE SESSION

1.1 Opening

1.1.1 The seventh session of the Services and Forecasting Systems Programme Area (SFSPA) Coordination Group (SCG) of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was opened by the SFSPA Coordinator, Dr Ming Ji, at 0900 hrs on Monday 4 March 2013, at the headquarters of Japan Meteorological Agency (JMA), Tokyo, Japan. Dr Ji welcomed participants to the session, and expressed his sincere appreciation to JMA for hosting the meeting.

1.1.2 On behalf of JMA, Mr Hideyuki Sasaki, Director General of Earth Environment and Marine Department, welcomed all participants to Japan. He noted that the importance and need for marine meteorological and oceanographic services have been expanding particularly along with the Global Framework for Climate Services (GFCS), and emphasized that JCOMM should continue to play a key role in the international coordination in this area. Mr Sasaki expressed his special interest and expectation in the Group's discussion on clear intersessional workplan for 2012-2017, including those to enhance JCOMM response to marine environmental emergencies. In closing, Mr Sasaki wished all participants a very successful meeting and an enjoyable stay in Japan.

1.1.3 Dr Ji noted that the focus during this session was to set clear, achievable and harmonized plans for the intersessional activities by the Teams of SFSPA for the current intersessional period (2013-2017), with a list of high priority activities, clear timelines and deliverables.

1.1.4 The list of participants is provided in [Annex I](#).

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 WMO Secretariat. This agenda is provided in [Annex II](#).

1.3 Working arrangements

1.3.1 The Group agreed its working hours and other practical arrangements for the session. Following the usual exercise of JCOMM meetings, the meeting (including the documentation) was conducted in English only, and all documents and information were provided through the meeting web site: <http://www.jcomm.info/SCG7>.

2 GUIDANCE AND REQUIREMENTS FROM JCOMM-4 AND WMO-IOC GOVERNING BODIES

Outcome and Decisions of JCOMM-4, regarding the SFSPA activities

2.1 The Group noted that, at the 4th session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM-4, May 2012, Yeosu, Republic of Korea), the Group and Teams of the SFSPA were re-established with revised Terms of References (see <http://www.jcomm.info/SFSPA>).

2.2 Dr Ming Ji provided a brief summary of guidance, requests and decisions by JCOMM-4. The Group discussed on those issues under respective agenda items 3 to 5, in reviewing the SFSPA intersessional workplan (2012-2017), and agreed on its actions accordingly.

Decisions of WMO governing bodies relating to SFSPA activities

2.3 Dr Boram Lee, WMO Secretariat, reported on the relevant decisions to the work of SFSPA, which were made at the 64th session of the WMO Executive Council (June 2012, Geneva, Switzerland). All the decisions, resolutions and recommendations of JCOMM-4 were adopted through the *WMO Resolution 2 (EC-64) – Report of the fourth session of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology*.

2.4 The Group noted the request of WMO Executive Council to all technical commissions including JCOMM to align their activities to Quality Management System (QMS) principles, considering that QMS is primarily a management tool to ensure customer focus, corrective and preventive action, and continuous improvement of products and services. Building on the successful and ongoing JCOMM QMS pilot project implemented by the Australian Bureau of Meteorology, it was decided at JCOMM-4 to develop competency requirements for marine meteorology and oceanography through an ad hoc Task Team on Marine Competency Requirement (<http://www.jcomm.info/TT-MCR>), following the Recommendation 5 (JCOMM-4). The Group noted that the work of the Task Team would require input (through the identified Task Team members) and timely review by the SFSPA Teams, and agreed to provide necessary input to the Management Committee in reviewing the draft requirements. The detailed discussion and decisions are recorded under agenda item 5.

2.5 The Group took note of WMO's ongoing efforts for, and progress in, the establishment of the Global Framework for Climate Services (GFCS). Recalling that contributing to GFCS implementation for marine and coastal communities should be a high priority for the intersessional period, and that SFSPA have a number of core mandates of JCOMM that directly support the GFCS, the Group agreed to continue its efforts along with fulfilling the Commission's core service mandates in providing maritime safety services as well as supporting marine and coastal emergency responses and risk reduction. Further discussion was recorded under agenda item 5.

Decisions of IOC governing bodies

2.6 IOC Executive Council at its 45th Session (June 2012, Paris, France) congratulated on the achievements of JCOMM and its successful 4th Session at Yeosu, Republic of Korea. The IOC Executive Council accepted recommendations in the JCOMM-4 Session Report. The commission appreciated the success of JCOMM programmes, and encouraged further development of operational oceanography for sustained observations and services. On a related note, the Group re-emphasized the importance of sustaining observing networks by research-funding.

3 REVIEW OF THE DRAFT SERVICES AND FORECAST SYSTEMS PROGRAM AREA WORK PLAN FOR THE CURRENT INTERSESSIONAL PERIOD

3.1 The Group noted that this was the main objective of the session, to identify 1) expected outcomes; 2) key activities, 3) timeline/milestones; and, 4) responsible person(s) for key activities during the 2012-2017 intersessional period. The agreed work plan of the SFSPA Teams are documented at JCOMM web site (<http://www.jcomm.info/SPAWP>), while it remains as a dynamic document for necessary update.

3.2 The Group, in reviewing the work plan, recalled the list of priority activities endorsed at JCOMM-4, for SFSPA:

[Operational Ocean Forecasting Systems and Services]

- Develop technical documentation, particularly the new *Guide to Operational Ocean Forecasting Systems*, and provide relevant contributions to the *Manual on the Global Data-Processing and Forecasting System* (GDPFS, WMO-No. 485);
- Continue implementing operational ocean forecasting services for daily to seasonal time scales, including developing performance metrics and coordinating data management and dissemination standards through close collaboration with DMPA and CBS;
- Coordination of ocean metrics for monitoring ocean extremes in close collaboration with OOPC;
- Develop a JCOMM coordination framework to support ocean and marine requirements for operational coupled seasonal climate forecasting systems, in support of the GFCS;
- Coordinate the development of oceanic dispersion modelling, prediction and impact assessment capabilities through partnerships with the Global Ocean Data Assimilation Experiment (GODAE) Ocean View Science Team (GOVST), IAEA, and IMO/IHO to address the marine emergency response needs for oceanic discharge of radioactive hazards;
- Maintain and update requirements documents for ocean applications, including RRR and SoG;
- 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>).

[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 *Manual on 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). This work further aims to provide advice for regional and national forecast/warning systems for coastal meteorological/oceanographic hazards;
- Support Members/Member States in establishing Extreme Wave datasets 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 efforts for coordinated wave climate projection (COWCLIP).

[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 enhance ENC/Electronic Chart Display Information System (ECDIS) or other display capabilities for met-ocean safety information, under the agreed scheme for IMO e-Navigation;
- Maintain and update technical documentation, including the Manual on Marine Meteorological Services (WMO-No. 558), Guide to Marine Meteorological Services (WMO-No. 471), relevant parts of the Manual on the Global Data-Processing and Forecasting System (GDPFS, WMO-No. 485), and sea-ice standards and reference material;
- Assess services requirements for marine pollution emergency response, through enhanced partnerships with IAEA, IMO, IHO and other partners. This work will be conducted in parallel with the development and implementation of a JCOMM Strategy for enhanced marine pollution emergency response, with a focus on radioactive material discharge;
- Enhance interaction with marine users to keep abreast of user requirements for improvement of services, and improve service/information interface;
- Address emerging requirements for extended maritime safety information, including marine volcanic ash fall hazard advisories and developing warnings for high impact space weather events.

[Quality Management and Capacity Building]

- Leverage on the successful implementation of a Quality Management System (QMS) at several advanced Services to expand the QMF/QMS approach in NMHSs in developing Members/Member States through training and pilot demonstrations;
- Support training for operational ocean forecasting;
- Continue supporting the Storm Surge Watch Scheme (SSWS), including training workshops on storm surge and wave forecasting (JCOMM/TCP training workshop series);
- Continue supporting and harmonizing sea-ice related training (e.g. IAW, COMET, manual for ice experts —ice observers).

3.3 The Group then received brief reports by Chairs of the Expert Teams, Mr Henri Savina (ETMSS), Dr Gary Brassington (ETOOFS), Dr Kevin Horsburgh (ETWCH) and Dr Vasily Smolyanitsky (ETSI) on the status of the SFSPA workplan / priority projects. The updated and agreed plan (after discussion) for each priority project is reproduced in [Annex III](#) to this report, as well as at <http://www.jcomm.info/SPAWP>. All identified leaders of the project would regularly report on the progress to SCG, with a view to achieving the goal following the agreed timeline (**Action; by all Teams and experts; continuous during the intersessional period**).

3.4 During the discussion, the Group took note of the issues relating to the Teams' intersessional work, and agreed on the actions as follows:

- (a) Guide for operational ocean forecasting systems (Project #1): The Group took note of the plan of ETOOFS to review and consolidate the first draft of the Guide immediately after the 4th session of ETOOFS (25-29 March 2013, Washington

D.C., USA). The Group noted that the Guide is designed to address operational requirements for ocean forecasting, and advised to involve various expert groups in the review process; such as groups within the GOOS Regional Alliances, GODAE OceanView and other scientific communities including Ocean Surface Topography Science Team (OSTST), Group for High Resolution Sea Surface Temperature (GHRSSST) and Argo Steering Committee (**Action; by ETOOFS; continuous until 2016**). All members of the Group were requested to review the draft Guide and provide feedback (**Action; by all SCG members; by ETOOFS-4 and continuous until 2016**).

- (b) Observational requirements (Project #2 and part of Project #10): The Group noted that the WMO Commission for Basic Systems (CBS) established the Inter-Programme Expert Team on the Observing System Design and Evolution (IPET-OSDE) as successor of the Expert Team on Evolution of the Global Observing Systems (ET-EGOS), in charge of the WMO Rolling Review of Requirements (RRR). The first session for IPET-OSDE was planned in July 2014. Noting that the review of RRR and Statement of Guidance (SoG) for marine/oceanographic aspects were to be conducted by ETOOFS and ETWCH, the Group agreed that JCOMM input should be reviewed and coordinated to avoid the potential conflicts. The Group requested the Chairs of ETOOFS and ETWCH, and the responsible member of the Management Committee (Ali Mafimbo) to organize review of the marine and ocean components of current SoG and RRR, in advance to providing input to IPET-OSDE, and prepare harmonized and consolidated comments out of those from different Teams (**Action; by G.Brassington, K.Horsburgh and A.Mafimbo; by July 2014**).
- (c) Ocean Extreme Monitoring System (project #4) and Coordination for Climate Forecast System (Project #6): The Group requested the ETOOFS at its 4th session (25-29 March 2013, Washington D.C., USA) to discuss with the Expert Team on Extended and Long-range Forecasting (ET-ELRF) on the SoG for Seasonal to Inter-annual Forecasts (**Action; by M.Ji and G.Brassington; by ETOOFS-4 in March 2013**).
- (d) Implement recommendations from JCOMM Storm Surge Symposium (Project #9): The Group noted that a number of activities had been initiated and achieved from the 1st Storm Surge Symposium (September 2007, Seoul, Republic of Korea) with regard to storm surge applications. The Group agreed that the 2nd Storm Surge Symposium should be organized during the intersessional period as a matter of priority, and requested the ETWCH to take the lead, starting from the discussion at its 4th meeting (April 2013, Paris, France) (**Action; by ETWCH with K.Horsburgh lead; ASAP and by December 2013**). The Group suggested several topics to be addressed at the Symposium, including; 1) sharing best practices and monitoring progress in storm surge applications; and, 2) enhancing links with ETOOFS in the context of boundary conditions for coastal modelling.
- (e) Wave Forecast Verification (Project #11): The Group, recognizing the benefit of participating centres to Wave Forecast Verification in assuring the quality of wave forecast model products, advised that closer connection to the downstream application and day-to-day forecasting products from the models would be taken into account in the future verification exercise, in view of an end-to-end warning system verification.
- (f) Coastal Inundation Forecasting Demonstration Project (Project #14): The Group noted with pleasure the rapid development and expansion of the WMO JCOMM-CHy Coastal Inundation Forecasting Demonstration Project (CIFDP:

<http://www.icomm.info/CIFDP>), in line with WMO priority of supporting Members for Disaster Risk Reduction (DRR). Meanwhile, the Group understood that significant human resources for the Secretariat and experts (particularly those of ETWCH) were required to coordinate and support the increasing number of CIFDP National Sub-Projects, and suggested that the CIFDP Steering Group and ETWCH would consider an efficient way of distributing experts' time and involvement (**Action; by CIFDP PSG and Secretariat; ASAP**). Noting the essential component of capacity development / technology transfer in CIFDP implementation, the Group noted that there is no room for complacency – even those countries with advanced modelling capability – in terms of integrated and coordinated service delivery for coastal inundation. The Group therefore suggested that the CIFDP framework should be considered not only for the developing countries but also for all countries with issues of coastal inundation.

- (g) The Group was reported on the discussion at the 4th session of ETMSS (27 February – 2 March 2013, Tokyo, Japan) regarding the WMO Manual on Marine Meteorological Services (WMO-No.558) and WMO Guide to Marine Meteorological Services (WMO-No.471), and took note of the new project in the SFSPA workplan to review overall structure of WMO-No. 558 & WMO-No. 471, in view of making a recommendation for a new structure of those mandatory publications without duplication and/or potential conflict in contents. The Group also noted the decision at ETMSS-4 to clearly document guidelines for Members applying to be Preparation / Issuing Services for the Global Maritime Distress and Safety System (GMDSS) Marine Broadcasting System (see new [Project #15](#) in [Annex III](#)).
- (h) Mr Henri Savina, ETMSS Chair, informed the Group of a new project agreed at ETMSS-4, to review and standardize text format(s) for Maritime Safety Information (MSI), in order to allow decoding and display of Electronic Navigation Charts (ENC), and in line with the ongoing development of e-Navigation (see new [Project #16](#) in [Annex III](#)).
- (i) The Group agreed on the usefulness of the regular survey conducted by ETMSS and WMO Secretariat on Maritime Safety Information broadcast, as a primary component of the Quality Management (QM). The Group advised that the survey should be designed based on clear goals (to obtain the feedback on the quality of broadcasting and usefulness of information, rather than the quality of national products).
- (j) Taking into account the increasing number of common issues and joint activities, the Group agreed on the need for enhanced and well-planned cooperation with the International Maritime Organization (IMO) and International Hydrographic Organization (IHO). The Group agreed to set a clear workplan for the intersessional period in this regard. The related decision is described under agenda item 6.
- (k) The Group reviewed the related projects to the issues of enhanced JCOMM coordination for marine environmental emergency responses, and agreed on the revision (see [Projects #24, #25, and new #30](#) in [Annex III](#)). Related decisions are recorded under agenda item 4.
- (l) With regard to the Search and Rescue (SAR), the Group noted that the Manual on Marine Meteorological Services (WMO-No. 558), in Part 1, section 3.2, as well as in Part 2, section 3.2.4, broadly describes the services to be provided in support of Search & Rescue. The Group agreed that this part should be reviewed

and revised to reflect current operation and available technologies. It particularly pointed out that the concept of METAREAs would not serve efficiently for SAR or response to marine environmental accidents. In this regard, the Group agreed that the established task team should submit to the ETMSS then to the SCG a recommendation to re-structure the global coordination of SAR and marine environmental accident response (see *Projects #25 and #30*, as well as item 4 of this Report). The recommended changes, once agreed and approved, should be included in the next revision of the WMO-No.558 (**Action; by WMO Secretariat; by the next revision of WMO-No.558 and after reception of recommendations**). Related decision and actions are also noted under agenda item 5.

- (m) The Group reviewed and agreed on the Projects to be carried out by the ETSI, relating to enhanced ice services of GMDSS (*Project #26*) and ENC/ECDIS for ice navigation (*Project #27*). Related effort and outcome of ETSI included the “Ice Objects Catalogue” (version 5.2, by March 2013), documentation for ice in ENC as a new IHO S-10x standard, input to weather and ice safety related to Polar Code, in coordination with the IHO TSMAD and collaboration with the International Ice Charting Working Group (IICWG). The Group also noted the contribution to the GCW Cryonet and IPI implementation, through the updated WMO sea ice standards and technical publications (*Project #28*). The Group requested the ETSI, in coordination with the WMO Secretariat, to revise the electronic versions of documentation through the “fast-track” process similar to WMO-No.558 (**Action; by ETSI and WMO Secretariat; ASAP and before end 2014**). Following discussion and remarks from the co-presidents, a new ETSI Project #31 was proposed, for the enhancement of integrated ice services and numerical ice forecasting. Related discussion is recorded under agenda items 5.4 and 6.

4 ENHANCEMENT OF JCOMM CAPABILITY FOR MARINE ENVIRONMENTAL EMERGENCIES

4.1 The Group recalled the decision at JCOMM-4, through Recommendation-4 (JCOMM-4), that an ad hoc task team led by the SCG Vice-Chairperson should develop the implementation strategy and plan to for an international coordination framework to support response to marine environmental emergencies (with a focus on the maritime discharge of radioactive hazard). It was also included in the SFSPA intersessional Workplan for 2012-2017 (*Projects #24, #25 and #30* in [Annex III](#)).

4.2 Mr Nick Ashton, SCG Vice-chairperson, reported on the progress since JCOMM-4. While there had been no move to establish a task team, an initial meeting of the WMO Secretariat and Mr Ashton was held on 1 February 2013, to consider how this work might progress, and to highlight any particular issues that might need to be resolved. The discussion was mainly on hearing the experience of coordinating response for atmospheric and terrestrial emergencies relating to radiological material discharge, and exploring ways to relate the expertise and framework to marine emergencies. Based on the discussion, Mr Ashton identified several priority issues that the future task team should consider, as follows:

- (a) Identifying, with any authoritative parties, the exact requirements for specific information;
- (b) Which, if any, stakeholders there might be for this work – who has the need for this information?

- (c) Identifying who has responsibility for the deep oceans in respect of pollution, radioactive or otherwise – is there, for example, an international/inter-governmental organisation with clear responsibility for the area?
- (d) What arrangements can be put in place to test and validate any changes and enhancements, which may be introduced?
- (e) What is the process to implement any changes to current practices, particularly if they influence international legislation, for example, the MARPOL Convention?

4.3 The Group expressed its concerns that little progress has been made since JCOMM-4 to establish the task team, to draft a JCOMM strategy based on the approved outline – Annex to Recommendation-4 (JCOMM-4) – and to set a work plan to pursue this task. The Group noted the relevant discussion at the ETMSS-4 session (27 February – 2 March 2013, Tokyo, Japan) which identified several members of ETMSS to become a member of the task team. The Group also acknowledged JMA's notification to contribute to the work of the task team through an expert as member of the task team.

4.4 The Group noted that, adding to the issues presented by Mr Ashton (see paragraph 4.2), the future framework should consider the type of service products depending on available models/tools. The Group considered that, various aspects of marine environmental aspects (e.g. radioactive material discharge, Search and Rescue, oil spill) might require different technologies and coordinating framework. The Group also noted that, approaches to specific observing requirements for material dispersion upon occurrences should also be considered.

4.5 The Group noted that the existing mechanism of Regional Specialized Meteorological Centres (RSMCs) of WMO to support response to atmospheric nuclear environmental emergencies. Recalling the similar discussion at JCOMM-4, the Group reaffirmed that the proposed framework should be built on the existing mechanism and capabilities while identifying gaps and propose ways to fill them for oceanic aspects. The Group also noted the existing regional and global coordination bodies in this area, such as European Maritime Safety Agency (EMSA) and Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC).

4.6 The Group agreed that this ad hoc task team should be active during the defined period under the Group's guidance, to; 1) firstly, submit a draft proposal for an international framework for responses to marine radioactive material discharge, as well as a JCOMM work plan to accomplish this goal; then, 2) submit a proposal to streamline the global coordination of marine environmental emergency responses, to ensure that existing capabilities within the Marine Pollution Emergency Response Support System for the high seas (MPERSS, including SAR) are not compromised by any reapportionment of resources. The Group agreed on the team's Terms of Reference, as well as the membership as reproduced in [Annex IV](#), and requested Mr Ashton to report to the Group on the results/deliverable in the given timeline (**Action; by N.Ashton and the established task team; by mid 2014 and December 2014 upon agreed timeline for Project #30**).

4.7 The Group recalled that the MPERSS website (<http://www.maes-mperss.org>), currently maintained by Météo-France, contained mostly descriptive information, which could be maintained together with the general JCOMM information. The Group requested the Secretariat, until the new proposed framework would be approved, to transfer information from the Météo-France server to JCOMM web site (<http://www.jcomm.info>) and maintain the page together with other information of JCOMM (**Action; by Secretariat in coordination with P.Daniel (Météo -France); ASAP and before May 2013**). The current URL would be

maintained and re-directed to the new page, and the MAES-MPERSS domain would be sustained until all information at the new page would be verified.

5 OTHER KEY CROSS-CUTTING ISSUES IN MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES

Quality management implementation for JCOMM

5.1 The Group recalled the decision at JCOMM-4 that the JCOMM should continue to encourage a quality management approach to the delivery of met-ocean data, products and services. The Management Committee (MAN) was tasked to coordinate the activities regarding quality management approach, to; 1) assist the efficient and effective management and operation of a service; 2) assist Members/Member States in adopting good management practices; and, 3) enhance user confidence in the quality of data, products and services. In this context, a MAN member, Mr Bryan Boase, was designated to lead the relevant activities during the intersession period in coordination with the WMO Task Team on Quality Management Systems (QMS) Implementation.

5.2 A member of the Management Committee, Mr Bryan Boase, has led JCOMM implementation of QMS following Recommendation 5 (JCOMM-4). The Group took note of the progress in establishing an ad hoc Task Team on Marine Competency Requirements (TT-MCR: see <http://www.jcomm.info/TT-MCR>), to develop a generic set of marine weather forecast competencies based on existing examples of the WMO Commission for Aeronautical Meteorology (CAeM) and of several countries including USA, Canada and Australia. The Group noted that the developed document would address competencies in service provision while training and educational requirement would naturally be driven from the agreed competency requirements. The Group agreed to provide input to the Management Committee for the internal review of the draft requirement document, once submitted by the ad hoc Task Team (**Action; SCG led by ETMSS, when the draft document is submitted and not later than December 2013**).

5.3 The Group considered that, in the future, the user requirements for maritime safety services should be clearly delivered from and coordinated by responsible organizations such as IMO, which would require closer coordination between WMO and IMO similar to the case of the International Civil Aviation Organization (ICAO) and WMO Commission for Aeronautical Meteorology (CAeM) for the case of aero-meteorological information services. The related discussion and decisions are recorded under agenda item 6. The Group also advised that the document should take into account the ongoing development of requirements for Tsunami warning services, coordinated by UNESCO/IOC.

JCOMM contribution to the Global Framework for Climate Services (GFCS)

5.4 The Group recalled the discussion at JCOMM 4, that contribution to the Global Framework for Climate Services (GFCS) implementation for marine and coastal communities was set as high priority of SFSPA for the intersessional period, along with fulfilling the Commission's core service mandates in providing maritime safety services as well as supporting marine and coastal emergency responses and risk reduction. A number of projects within the SFSPA intersessional workplan was addressing issues directly related to the various elements of GFCS, understanding on additional contribution from other Programme Areas (PAs) and Teams, as following:

- (a) Polar Met-Ocean and sea ice information services (ETMSS, ETSI, ETOOFS): developing meteorological and oceanographic information for safety and efficiency of ice navigation and for response to marine environmental accidents in the Arctic

Ocean, Southern Ocean and other areas with seasonal ice cover [Projects #26 and #31], and developing ice charting archival and climatology [Project #29];

- (b) Reducing coastal natural hazard risks through demonstration and capacity building in storm surge and coastal inundation forecasting (ETWCH): developing a GFCS component for coastal inundation forecasting and warning, through CIFDP [Project #14], establishing a storm surge climatology and contribution to the JCOMM-WCRP Coordinated Wave Climate Projection (COWCLIP) [Project #8];
- (c) Ocean observation and modelling in supporting coupled seasonal climate forecasting systems (ETOOFS): Establishing integrated/coordinated ocean model guidance with the intention of extending ocean predictions to a seasonal scale [Project #6];
- (d) Contributing to the MAN workplan in developing Climate Services for Fisheries Community (MAN): extending/expanding user interface dimensions of the GFCS regarding fisheries and food security, particularly in the Southern Hemisphere.

5.5 Regarding item (d) above, the Group noted that JCOMM and WMO Commission for Agricultural Meteorology (CAgM) jointly established a Task Team on Weather, Climate and Fisheries (TT-WCF: <http://www.jcomm.info/TT-WCF>), which recently agreed on the intersessional workplan at its first meeting on 16 February 2013, Numea, New Caledonia. The Group, agreed to the importance of this task in contribution to GFCS ensuring food security, noted that the primary contribution of JCOMM to this team is to review the current data availability and needs, in view of enhancing the application of ocean climate data in fisheries management. The Group also advised for the need of continuous interaction with oceanic/coastal fisheries management organizations to advocate the advantages to participate in metocean observations, to extend understanding on the importance of ocean climate observations.

5.6 Mr Johan Stander, JCOMM Co-president for Meteorology, provided an overview of the process in WMO to establish and implement GFCS. The Group considered that those coherent JCOMM activities to GFCS elements, for marine aspects, should be clearly communicated to the WMO governing bodies and to the community, and agreed to work with the Co-presidents and Management Committee to provide a brief description of JCOMM contribution to GFCS at its 10th session (May 2013, Paris, France) (**Action; by all SCG members led by Coordinator; by MAN-10**).

5.7 The Group noted the recent work of the WMO Executive Council Task Team on the WMO Policy for International Exchange of Climate Data and Products to support the implementation of the Global Framework for Climate Services, for which JCOMM representative (Dr Peter Dexter) provided input regarding the need for free and unrestricted data exchange for climate services in line with the WMO *Resolution 40 (Cg-XII)* as well as the IOC ocean data policy.

Amendment to WMO-No.558, WMO-No.471 and related Manuals/Guides

5.8 The Group also noted and agreed to the decision at ETMSS-4 to clearly document guidelines for Members active as / intend to become Preparation / Issuing Services for GMDSS Marine Broadcasting System, for inclusion in WMO-No.558 and Joint IMO/IHO/WMO MSI Manual, and to be circulated amongst all Issuing Services / METAREA Coordinators.

5.9 The Group was reported on the discussion at the 4th session of ETMSS (27 February – 2 March 2013, Tokyo, Japan) regarding the WMO Manual on Marine

Meteorological Services (WMO-No.558) and WMO Guide to Marine Meteorological Services (WMO-No.471), and took note of the new project in the SFSPA workplan to review overall structure of WMO-No. 558 & WMO-No. 471, in view of making a recommendation for a new structure of those mandatory publications without duplication and/or potential conflict in the contents (see new Project #15 in Annex III).

5.10 In the meantime and until the review and re-publication would be completed, the Group requested the WMO Secretariat and Expert Teams to keep reviewing and monitoring required updates of those two publications. As an immediate action, it was agreed that the addenda for WMO-No.558 should be published by the end of 2013, based on the agreed modification at JCOMM-4 (**Action; by identified ETMSS members and WMO Secretariat; ASAP and before end 2013**). The new edition of WMO-No.471 should also be published as soon as possible, reflecting changes made since 2001 until present (**Action; by ETMSS members (for review) and WMO Secretariat; ASAP and before end 2013**).

5.11 The Group also noted the following parts of WMO-No.558 requiring immediate review and revision, and requested the Expert Teams and WMO Secretariat to carry out review and revision through the “fast-track” process (**Action; by ET members and WMO Secretariat; ASAP and before end 2014 following the agreed schedule for each task**);

- (a) Services to be provided in support of Search & Rescue (Volume I, Part I, section 3.2): to be revised based on the review by identified ETMSS members, and by the work of the ad hoc task team on JCOMM coordination for marine environmental emergency responses.
- (b) Training in the field of marine meteorology (Volume I, Part IV): to be revised based on input and recommendations from TT-MCR.
- (c) Regional aspects (Volume II): to be revised and re-structured with reference to the Implementation Plans of WMO Regional Associations and of the Tropical Cyclone Programme.

5.12 The Group recalled a request to JCOMM from CBS for input to the metocean-related parts of the revised Global Data Processing and Forecasting System (GDPFS, WMO-No. 485), for 1) wave forecasting and verification; 2) ocean forecasting; 3) maritime meteorological services, and other related issues. Noting the importance of this publication in the operational work of the NMHSs, and that most requests have been met within the deadline, the Group requested the WMO Secretariat to work with ETMSS to complete the provision of required information (**Action; by ETMSS and WMO Secretariat; by end March 2013**).

Capacity Development

5.13 The Group recalled the JCOMM Capacity Development Principles agreed at JCOMM-4, stating that the JCOMM Capacity Development (CD) should be implemented by the respective Programme Areas (PAs) and included in their respective workplans. The Group noted that a number of projects within the SFSPA workplan include CD elements, for example;

- (a) Support the series of JCOMM-TCP in-region training workshops on wave and surge forecasting;
- (b) Support for “Ice Analysts Workshop” on regular scale;

- (c) Support for sea-ice training documentation and courses including COMET modules and manual for ice experts – ice observers;
- (d) Support METAREA Coordinators and Issuing Services in supporting Maritime Safety Services.

5.14 The Group noted that there has been no training and education effort made since JCOMM-II (2005) for those centres in charge of marine environmental accident responses under the current framework of MPERSS (Area Meteorological and Oceanographic Coordinators; AMOCs). Recalling the decision to review the current framework for MPERSS by the ad hoc Task Team on JCOMM Coordination for Marine Environmental Emergency Responses (see paragraph 4.6 and Annex IV), the Group agreed, once the proposal by the Task Team would be submitted, to plan a workshop/seminar of national and regional centres conducting MPERSS-related duties (**Action; SCG with ETMSS lead; after completion of the task team work, but before JCOMM-V**).

5.15 The Group also encouraged the SFSPA Teams to work with other Teams and Groups of JCOMM and related programmes for maximizing training and education opportunities, for example, a series of regional capacity development workshops of the JCOMM Data Buoy Cooperation Panel (DBCP) for ocean observations and applications.

5.16 In addition, the Group noted that development and maintenance of technical guidance material is the fundamental component of CD, and therefore encouraged all Teams of SFSPA to continue their focused efforts in developing and updating the mandatory publications including the Manual and Guide on Marine Meteorological Services (WMO-No.471 and WMO-No.558), Guide to Storm Surge Forecasting (WMO-No.1076), Guide to Wave Analysis and Forecasting (WMO-NO.702), and a new Guide to Operational Ocean Forecasting.

5.17 The Group emphasized the strong CD aspects of the CIFDP, through technology transfer/sharing for coastal inundation forecasting and warning, and welcomed the increasing participation of developing countries in developing CIFDP National Sub-Projects.

Observational Requirements for Metocean Services

5.18 The Group noted that the Teams of SFSPA continued to work on the review and update of the observational requirements for Metocean Services through the WMO RRR / SoG process during the intersessional period (See paragraph 3.4 (b), as well as Projects #2, #6, #10, and #31 of [Annex IV](#)). Ms Candyce Clark, OPA Coordinator, welcomed increased interaction between SFSPA and OPA in articulating observational requirements, emphasizing benefit for both strengthening products and services, and advocating sustained observations.

Cross-cutting issue

5.19 Dr Nadia Pinardi, Co-President for oceanography, gave an overview of the critical point of coordinating between activities of real time data collection and delayed mode data distribution, in order to serve the need of the SFSPA and the WIS construction. She would recommend a new cross-cutting task team on oceanographic and marine data flows across JCOMM in support of WIS, and requested SFSPA to contribute to this initiative.

6 ANY OTHER BUSINESS

WMO-IMO-IHO Coordination

6.1 The Group also noted that Recommendation 5 (JCOMM-4) addressed the issue of working with IMO (and IHO) on possible future working arrangements, to continuously update QMS requirements during the intersessional period. Taking into account the relevant decisions and recommendations from the 4th session of the Expert Team on Maritime Safety Services (ETMSS-4, 27 February – 2 March 2013), as well as those of the Management Committee, the Group agreed that more holistic and streamlined approach would be required not only to address the QMS requirements but also in dealing with the ongoing issues requiring WMO-IMO-IHO coordination, such as;

- (a) METAREA coordination in line with the NAVAREA coordination;
- (b) Review/revision of relevant Rules and Regulations, and World-Wide Met-Ocean Information and Warning System (WWMIWS);
- (c) Joint technical development relating to e-Navigation and revision of GMDSS; and,
- (d) Improved coordination for SAR, and response to marine environmental accidents;
- (e) Polar code development;
- (f) Enhancing ENC/ECDIS for sea ice and metocean information.

6.2 The Group therefore requested the SFSPA Coordinator and SCG Vice chair, with input from the Secretariat and ETMSS chair, to draft a work plan for WMO-IMO-IHO coordination during the intersessional period including responsible persons, key issues and timeline. The plan should be reviewed and agreed by the relevant Team Chairs and the Management Committee **(Action; led by N.Ashton and M.Ji working with H.Savina, V. Smolyanitsky and WMO Secretariat; ASAP and by September 2013)**.

Long-term management and succession plans for JCOMM Teams/Groups

6.3 The Group recalled the decision at MAN-9 (September 2011, Geneva, Switzerland) that each Team should name a Vice-chairperson in order to ensure a succession plan and to share responsibilities during the intersessional period. The Group noted with pleasure that the SCG (Coordinator/Chair: Ming Ji, Vice chair: Nick Ashton), ETMSS (Chair: Henri Savina, Vice chairs: John Parker and Neal Moodie), ETSI (Chair: Vasily Smolyanitsky, Vice chair: Juergen Holfort) and ETWCH (Chair: Kevin Horsburgh, Vice chair: Val Swail) have identified vice chairpersons and planned for more evenly shared responsibilities between chairs and vice chairs. The Group encouraged all Teams to continue and extend such an exercise to efficiently implement the workplan during this unusually long intersessional period, and to ensure smooth transition in the longer term **(Action; all Teams and Group; continuous)**.

7 CLOSURE OF THE SESSION

7.1 Adoption of the list of action

7.1.1 The Group expressed sincere appreciation to Dr Boram Lee for the excellent support of the meeting.

7.1.2 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 active participation and contribution to the intersessional implementation, which had enabled substantial progress in achieving the goals set by JCOMM-4.

7.2.2 On behalf of the Group, Dr Ji and WMO Secretariat expressed their sincere thanks to the host of this Session, JMA, for excellent support and thoughtful arrangement.

7.2.3 The seventh session of the Services and Forecasting Systems Programme Area Coordination Group (SCG-7) closed at 1215 hours on Wednesday 6 March 2013.

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AGENDA

(as agreed at SCG-7, 4-6 March 2013, Tokyo, Japan)

- 1 Opening of the session**
 - 1.1 Opening
 - 1.2 Adoption of the agenda
 - 1.3 Working arrangements
 - 2 Guidance and requirements from JCOMM-4 and WMO-IOC governing bodies**
 - 3 Review of the draft Services and Forecast Systems Program Area work plan for the current intersessional period**
 - 3.1 Maritime Safety Services (MSS)
 - 3.2 Waves and Coastal Hazard Forecasting Systems (WCH)
 - 3.3 Sea Ice (SI)
 - 3.4 Operational Ocean Forecasting Systems (OOFS)
 - 3.5 Other priority areas including Quality Management, Capacity Development and Global Framework for Climate Services
 - 4 Enhancement of JCOMM capability for marine environmental emergencies**
 - 5 Other key cross-cutting issues in marine meteorological and oceanographic services**
 - 6 Any Other Business**
 - 7 Closure of the session**
 - 7.1 Adoption of the report
 - 7.2 Closure
-

2012 -2017 SFSPA PROJECTS
(as agreed at SCG-7, 4-6 March 2013, Tokyo, Japan)

List of Projects:

- Project #1: Complete guide for operational ocean forecasting systems
- Project #2: Observational Requirements
- Project #3: Performance Monitoring
- Project #4: Ocean Extremes Monitoring System
- Project #6: Coordination in Seasonal Climate Forecast System
- Project #8: Wave and Surge Climate Services
- Project #9: Implement recommendations from JCOMM Storm Surge Symposium
- Project #10: Develop and update guidance documents
- Project #11: Wave Forecast Verification
- Project #12: Wave measurement evaluation and test
- Project #13: Capacity Development
- Project #14: Coastal Inundation Forecast Demonstration Project (CIFDP)
- Project # 15: Revision overall structure of WMO No. 558 & WMO No. 471 and preparation guidelines for Members applying for Preparation / Issuing Service
- Project #16: Standardization format(s) for met-ocean MSI in text format
- Project #17: Update the joint manual on MSI and IMO Resolution A.705
- Project #18: Conduct Online Survey every 2 years
- Project #19: Disseminate MSI on GTS and the GMDSS website
- Project #20: Catalogue on Met-Ocean Object Class for ENC and e-Navigation
- Project #21: Facilitate implementation of QMS among members of the provision of MSS
- Project #22: Develop guidelines for marine volcanic ash advisory
- Project #23: Identify measures to provide marine navigational warnings for severe solar magnetic storms
- Project #24: Development of Oceanic Emergency Response Support Capability
- Project #25: Develop oceanic radioactive hazard tracking system for enhanced MPERSS
- Project #26 Support and enhance the Polar components of GMDSS
- Project #27: Support and enhance ENC/Electronic Chart Display Information System (ECDIS) for ice navigation
- Project #28: Maintain and update sea ice technical documentation
- Project #29 Support for Sea ice climatology and ice information systems
- Project #30 Task Team on JCOMM Coordination for Marine Environmental Emergency Responses
- Project #31 Enhance the integrated ice services and forecasting

-
- Green** – Project outcomes achieved by JCOMM-V
- White** – Completion time line to be determined
- Yellow** – Possible to achieve the outcomes by JCOMM-V
- Blue** – Lead by other PAs/Organization

Project #1: Complete guide for operational ocean forecasting systems

Project Leader(s): Alistair Sellar
Project Team: Frank Bub
Gary Brassington
Guimei Liu

Project Description:

The development of a guide for operational ocean forecasting systems serves many purposes. Promotion of best practice amongst providers, document the products suites and points of contact for access as well as serve as a guide to new providers with an overview of the state of the art systems. The concept of a operational guide is common amongst WMO agencies and has been previously undertaken by the expert team for waves and storm surge. The guide will be coordinated by a lead editor and a team of chapter writers from the ETOOFS team and member institutions and other forecast providers.

- **Expected Outcomes:**
 - Live document (secure)
 - Guide, first draft
- **Key Activities:**
 - Establish process (e.g., content writers, reviewers, submissions)
 - Contents – description of content (Adrian first draft)
 - Submissions from member centres
- **Timeline/milestones:**
 - October 2012: agree process and priorities for content
 - November 2012 - December 2013: chapter writing
 - March 2013 (ETOOFS-4): review structure/list of contents chapter writing
 - 2014: expert review by ETOOFS and consolidation into draft document
 - 2015: international review - distribute access to a team of reviewers followed by an open review inviting the ocean community to comment
 - 2016: publication
- **ETs, Other Organizations and participants:**
 - ETOOFS,
 - National agencies and forecast providers

Project #2: Observational Requirements

Project Leader(s): *Guimei Liu*
Project Team: Sudheer Joseph
Shiro Ishizaki
Gary Brassington

Points of contract: Kevin Horsburgh (ETWCH), link/coordination with Project #10
Ali Mafimbo (JCOMM)
Etienne Charpentier (WMO)

Project Description:

The area of ocean observational requirements is an important component of the [WMO Observing Requirements database](#). User requirements are collated in a comprehensive, systematic and quantitative way to capture observational requirements and eventually meet the needs of ocean forecasting.

Using the Rolling Requirements Review (RRR) process defined by the manual on the Global Observing System, user requirements for observations are compared with the capabilities of present and planned observing systems. The output of this is reviewed by experts in the relevant application and used to prepare a Statement of Guidance (SOG), the main aim of which is to draw attention to the most important gaps between user requirements and observing system capabilities, in the context of the application. The SOG provides an assessment of the adequacy of observations to fulfill requirements and suggests areas of progress towards improved use of satellite and in situ observing systems.

The Expert Team on Operational Ocean Forecasting Systems (ETOofs) is responsible to: manage and maintain the requirement documents, adhering to relevant Quality Management Systems, for members/member states providing ocean forecasting services; prepare submissions on the requirements (e.g., research, observational and data management) of OoFS Members/Member States to other international groups. The requirements are regularly reviewed by groups of experts and contribute to the JCOMM SPA statement of guidance and the WMO RRR (<http://www.wmo.int/pages/prog/sat/RRR-and-SOG.html>).

- **Expected Outcomes:**
 - Update SoG document
 - Contribute OoFS requirements to CBS/RRR
- **Key Activities:**
 - Establish survey document based on SoG and RRR
 - Collate submissions from member centres
 - Formulating more specific requirements for ocean observations on the basis of improved understanding of data utility
 - Responding to the decisions and requests of the WMO Members and IOC Member States
 - Contributing to the implementation of the Global Framework for Climate Services (GFCS) for marine and coastal communities
- **Timeline/milestones:**
 - *SOg was Updated in March 2012 by the PoC and approved by ET-EGOS-7, May 2012*
 - *Provide further update to JCOMM-related part of RRR and SoG (in coordination with Project #10) to IPET-OSDE, July 2014*
- **ETs, Other Organizations and participants:**
 - ETOoFS, ETWCH, national agencies, OPA/OCG

Project #3: Performance Monitoring

Project Leader(s): Frank Bub, Gary Brassington

Project Description:

Performance monitoring of the operational ocean forecast systems is a critical element for promotion of best practices and offering guidance on daily performance. The primary goal for this project is to establish a suite of metrics that are performed and published in near real-time. The metrics will take into account both information and practical constraints of resourcing. This project proposes to have each operational centre push a common set of data products to a central server (e.g., USGODAE) from which the metrics will be computed and published online (e.g., <http://www.jcomm.info> or <http://www.jcommops.org>). The ETOOFS will maintain a close relationship with GODAE OceanView task teams to define and assess the operational data products and metrics. The objective for the current intersessional period is to develop next generation metrics for Operational Ocean Forecast Systems.

Expected Outcomes:

- Universally acceptable ocean model monitoring system
- ETOOFS member model-model comparisons
- Improved understanding of members' model skills and weaknesses

Key Activities:

- Agree on and document the process (see outline below)
- Establish data collection and analyses system
- Conduct routine metric comparisons
- Present results

Timeline/milestones:

- TBD

Expert Teams and/or Other Organizations and participants

- ETOOFS
- National agencies and ocean forecast providers
- Data (observation) collection, quality control, distribution will play an essential role

Project #4: Ocean Extremes Monitoring System

Project Leader(s): Gary Brassington

Project Team: Alistair Sellar
Frank Bub

Other contributors:

Points of contract: ETWCH
Ed Harrison

Project Description:

Extreme weather has a clear meaning whereby conditions are above normal and in general pose a risk of harm to people and/or property and/or the environment. The occurrence of large sea states and coastal surge are well known examples of dangerous conditions in the marine environment. Less well identified are extremes in the general ocean state, temperature, salinity and currents and their potential impacts for the environment. This project will aim to establish the scope and methodology for identifying extremes in ocean conditions from OOFs to raise awareness of their occurrence and help facilitate identification of impacts.

Expected Outcomes:

- Establish the first set of metrics and thresholds to identify ocean extremes for OOFs

Key Activities:

- Define the scope of ocean extremes, e.g., physical/spatial/temporal/littoral/coastal/ocean/surface/upper ocean/abyssal
- Define objectives of ocean extremes
- Define the methodology
- Establish first set of metrics

Timeline/milestones:

- March 2013 – Definition of ocean extremes
- 2014 – Establish first metrics and review
- 2015 – Consolidate and document in “the Guide”

Project #6: Coordination in Seasonal Climate Forecast System

Project Leader(s): Guimei Liu

Project Description:

The ocean model and ocean data assimilation components are critical for operational coupled seasonal climate forecast systems (CFS). Expertise in operational ocean modeling and ocean observations reside within the JCOMM community. Ocean model output (forecast guidance) from OOFs aims at lead times of several days, whereas the CFS extends ocean prediction lead times to weeks, month and seasons. Integrated/coordinated ocean model guidance from daily to seasonal time scales would have potential improved service benefits for a broad range of users. The CBS/ET-ELRF (note: it has a new name now) is responsible for operational CFS. This ETOOFS effort is to liaise with the CBS/ET-ELRF to coordinate technical and scientific ocean observing and user requirements for operational ocean models from OOFs and CFS. It will also provide integrates ocean observing requirements from both OOFs and CFS for the RRR updates.

• **Expected Outcomes:**

- Establish (e.g., common datasets, formats, variables, climatology) for ocean extremes monitoring
- Establish common metrics for ocean model performance (OOFs, CFS)
- Coordinated/integrated ocean observing requirements for both OOFs and CFS as input to the RRR process.

• **Key Activities:**

- Liaison with the CBS/ET-ELRF
- Establish common (output) requirements for ocean model guidance from OOFs/CFS
- Coordinate gathering ocean forecasting service requirements from “ocean weather” and climate users
- Coordinate on ocean observing requirements for input to the RRR process
- Articulating requirements for integrated applications of altimeter data from “ocean weather”, waves, and seasonal climate forecast applications.

• **Timeline/milestones:**

- *ET-ELRF meeting: ETOOFS liaison to participate*
- *ETOOFS-4: ET-ELRF rep. to participate*

• **ETs, Other Organizations and participants:**

- *ETOOFS, national forecasting centers, ET-ELRF(CBS), ECMWF, OPA*

Project #8: Wave and Surge Climate Services

Project Leader(s): *Kevin Horsburgh, Val Swail, Scott Woodruff*

Project Description:

JCOMM-4 requested the ETWCH, in collaboration with the ETMC, to continue its efforts to develop and maintain an Extreme Wave Dataset. This dataset will be populated with wave data where the significant wave height exceeded 14 metres, for use in model validation and validation of remotely-sensed waves, where such models and algorithms suffer from lack of sufficient data. ETWCH will work with ETMC and the ICOADS Partnership to develop a revised plan to establish the in situ component of the data set, and investigate with GlobWave on possible extension to remotely sensed data, much of which is already available online.

Following the recommendation from the 1st JCOMM Scientific and Technical Symposium on Storm Surges, JCOMM-4 requested the collaboration of ETWCH, ETMC and GLOSS on storm surge climatology and coastal hazards. In particular, coordination was requested for the development of storm surge climatologies, as a measure of risk assessment for marine hazards. In addition, assistance should be provided to Members/Member States in developing their own databases and hazard analysis, in view of its important potential contribution to the CFCS. This storm surge climatology dataset would also represent a significant contribution from JCOMM to the work of the CLIVAR-CCI-JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI).

JCOMM-4 agreed that the joint JCOMM-WCRP project Coordinated Ocean Wave Climate Projections (COWCLIP) would directly contribute to GFCS through the results of coordinated intercomparison on global wave projections between international research groups, and through better understanding uncertainty within the community ensemble of wave climate projections. ETWCH take a lead in coordinating this activity, with a view to including wave information in greater detail in the IPCC Fifth Assessment Report (AR5).

• Expected Outcomes:

- Establishment of an extreme wave data set, in conjunction with ICOADS
- Establishment of a storm surge data set, in cooperation with GLOSS
- Contribution to the IPCC AR5 on future wave climate projection

• Key Activities:

- Develop a revised plan for extreme wave dataset (with ETMC)
- Establish a pilot project (US, UK, Canada) for initial extreme wave data set
- Develop a questionnaire for Members/Member States to document their storm surge forecasting models, measured and hindcast storm surge data bases, to be included in the dynamic Storm Surge Guide
- Develop a plan for a storm surge climatology data set
- Contribute analysis results and journal papers in support of the IPCC AR5

• Timeline/milestones:

- Plans developed and approved by ETMC (Dec'12); ETWCH (May'13)
- COWCLIP progress meeting/workshop (Oct'13)
- 13th Waves Workshop and 4th Coastal Hazard Symposium (Oct'13)
- Develop questionnaire for storm surge models, data bases (May'13)
- Questionnaire results analyzed (Dec'13)

• ETs, Other Organizations and participants:

- ETWCH, ETMC, NOAA/NODC, DMPA groups, GLOSS, ETCCDI

• Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)

- 5.4.5 (COWCLIP)
- 7.2.11, 8.2.7 (Extreme Waves Dataset)
- 8.1.2, 8.2.5 (updating Guides)
- 8.2.6 (S&T support for coastal hazards forecasting/warning)
- 8.2.7 (SS climatology dataset)
- 8.2.8 (liaison with related teams/activities)

Project #9: Implement recommendations from JCOMM Storm Surge Symposium

Project Leader(s): *Kevin Horsburgh, Val Swail, Don Resio, Boram Lee*

Project Description:

JCOMM-4 recognized the importance of global scientific fora for exchange of information on databases, methodologies and techniques, and sharing expertise, which was one of the key recommendations from the 1st JCOMM Scientific and Technical Symposium on Storm Surges. It recognized the value of such exercises to develop technical advice for Members/Member States in fulfilling their services' duties in support of the requirements of users in the whole range of maritime activities and in disaster risk reduction. In this context, the Commission requested the Expert Team on Waves and Coastal Hazard Forecast Systems (ETWCH) to continue to co-sponsor and co-organize *International Workshops on Wave Hindcasting and Forecasting and Coastal Hazard Symposia* (see <http://www.waveworkshop.org>), and a follow-up event to the *JCOMM Scientific and Technical Symposia on Storm Surge* (<http://www.surgesymposium.org>).

ETWCH will also continue to collaborate with the European Space Agency (ESA) in support of improved storm surge forecasting through the *ESA Storm Surge Project* (<http://www.storm-surge.info/>) that aims to develop a comprehensive database of storm surge events, satellite data, NWP outputs and storm surge model outputs that can be used to explore and develop new tools, techniques and understanding of storm surge forecasting. In addition, ETWCH will continue to support the final stages of the UNESCO pilot project on coastal hazard forecasting in the North Indian Ocean (<http://www.jcomm.info/SSIndia>)

JCOMM-4 requested ETWCH to consider partnerships with the IOC Working Group on Tsunamis and Other Hazards related to Sea-Level Warning and Mitigation Systems (TOWS-WG) and the International Tsunami Partnership (ITP) of DBCP and the Indian Ocean Tsunami Warning System (IOTWS) in dealing with the full spectrum of multi-hazard monitoring, warning and preparedness issues.

- **Expected Outcomes:**
 - Support related S&T fora
- **Key Activities:**
 - Plan and conduct the 2nd JCOMM Storm Surge Symposium
 - Support ESA Storm Surge Project(s) and UNESCO NIO storm surge project
 - Organize 13th Wave Workshop and 4th Coastal Hazards Symposium
 - Liaison with tsunami warning system activities
- **Timeline/milestones:**
 - NIO Final Project Workshop (India, Oct'13)
 - ESA Storm Surge project meetings (Sep'12, Oct'13)
 - Plan for 2nd SS Symposium (to be held after 2013)
 - 13th Waves Workshop and 4th Coastal Hazards Symposium (Oct'13)
- **ETs, Other Organizations and participants:**
 - ETWCH, ESA, IOC, Environment Canada, USACE, TOWS-WG, ITP
- **Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)**
 - Overall actions derived from item 8.2 (coastal hazards)
 - 8.2.6 (S&T support for coastal hazards forecasting/warning, and coordination with Tsunami Group)

Project #10: Develop and update guidance documents

Project Leader(s): Kevin Horsburgh, Val Swail, Andrew Saulter

Project Description:

JCOMM-4 recognized the value of the *Guide to Wave Analysis and Forecasting* (WMO-No. 702) and other relevant technical guidance publications in ensuring the provision of high quality, accurate, consistent and timely operational forecast products. At the same time, recognizing the developments and advances relating to wave and storm surge forecasting, the Commission recommended these publications should be maintained as up-to-date as possible, and therefore requested ETWCH to keep the contents of these publications under review, as well as cross-referenced with other Manuals and Guides, including the *Manual of Quality Control Procedures for Validation of Oceanographic Data* (UNESCO/IOC M&G No. 26), and advise on the need for future updating as appropriate. Based on the review conducted in the past intersessional period, the Guide to Wave Analysis and Forecasting will be revised with a view to publication before JCOMM-5.

The Commission also requested ETWCH to continue to develop technical guidance materials on wave and storm surge forecasting for inclusion in the dynamic parts of the Guides. Such new material typically includes items such as: specific technical reports produced by the Team, proceedings of meetings such as the Waves Workshop, questionnaire results on Wave Models and Data Bases, descriptions and links to related material such as the online wave atlases.

There is a significant room for improving the provision of sea state, which should be considered as the most important parameter, in Maritime Safety Information (MSI). At the moment, the majority of Issuing Services preparing GMDSS MSI provide information on the significant wave height only, generally using the Douglas scale. This is very limited in comparison with data available from the NWP and certainly the constraints and needs of ships at sea. Many accidents occurred in coastal or open seas due to sea state, where significant wave heights were far below the thresholds fixed for the vessels, but in situations where the sea state was complex (e.g. crossing seas) or unusual (e.g. steep sea, risk of abnormal or freak waves). Key parameters should be proposed to provide more useful information for the safety of ships, especially in complex and dangerous seas. Type of parameters, and the related thresholds if any, should be defined in association with the ship masters, owners and manufacturers. The provision of improved sea state products should then be promoted among the Issuing Services and the WMO recommendations and guidelines updated accordingly.

- **Expected Outcomes:**
 - Revised Guide to Wave Analysis and Forecasting (WMO-No. 702)
 - Dynamic parts of wave and storm surge guides online
 - Contributions to and review as appropriate other related Manuals and Guides
 - Promote the provision of improved sea state products among the issuing services
- **Key Activities:**
 - Update wave guide by ET input + consultant work
 - Update dynamic part of guides as necessary (ET input)
 - Contribution on wave forecasting to GDPFS
 - Update of wave and surge requirements in the WMO Rolling Review of Requirements and Statement of Guidance.
 - Provide advice on related guides and manuals of WMO and IOC as requested
 - White paper on recommendations for including hazardous seas information in GMDSS
 - Develop wave model and data base questionnaire to be completed by Members/Member States
- **Timeline/milestones:**
 - Update dynamic Storm Surge Guide: SSS papers online (Jun'13); storm surge survey results online (Dec'13)
 - Update Dynamic Wave Guide: review plan for dynamic wave Guide content (May'13); Technical Reports on extremal analysis available online (Oct'12); Wave Workshop Proceedings available online (Oct'13), wave questionnaire results (Dec'13)
 - Develop wave model and data base questionnaire (May'13)
 - Analyze wave model questionnaire results (Dec'13)
 - Outline/contents of revised Wave Guide agreed, with writing assignments (Jun'13)
 - Contribute wave sections to GDPFS (by end 2012)
 - Update RRR and SoG (Jun'13)
 - Contribution to White Paper on Hazardous Sea State Forecasting for review by ETMSS and submission to IMO (Nov'13)
 - Contribution to QMS report on marine forecasting competencies (Sep'13)
- **ETs, Other Organizations and participants:**
 - ETWCH, ETMSS
- **Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)**
 - 5.2.4 (RRR & SoG update)
 - 8.2.2 (Develop proposals to include information on complex sea states)
 - Overall actions derived under item 10 (updating technical documents)

Project #11: Wave Forecast Verification

Project Leader(s): *Jean Bidlot, Hendrik Tolman*

Project Description:

One of the most important activities of the ETWCH continues to be the Operational Wave Forecast Verification. A routine inter-comparison of wave model forecast verification was first established in 1995 to provide a mechanism for benchmarking and assuring the quality of wave forecast model products that contribute to applications, such as safety of life at sea, ship routing, and, in general, the Global Maritime Distress and Safety System GMDSS. The project has expanded to include 17 centres, many running global wave forecast systems, with different wave models, different wind forcing, and different model configurations. The goal is to continue to add new participants, including regional participants, and to expand the scope of the intercomparison as feasible. Some participants are providing observations that are not commonly available on the GTS. This information is also being used to identify wave modeling shortcomings and it should continue to lead to improvement of future wave models, as it has been well documented to do in the past.

It is recognized that centres engaged in wave forecasting benefit from this activity in the same way as weather centres benefit from the exchange of forecast verification scores. During the intersessional period, the participating centres are requested to provide model data rather than agreed statistics because there isn't enough global wave data to produce a decent wave analysis, the quality of which would be controlled by data rather than model. The project also plans to expand the verification to include 1-D and 2-D spectral quantities, satellite quantities, and to investigate the continued development of spatial intercomparison techniques for wave forecasts in cooperation with the European Space Agency's GlobWave Project.

- **Expected Outcomes:**
 - Contribution to improved operational wave forecasts
 - Expansion of the Wave Forecast Verification Exchange Project in coordination with the ESA GlobWave project
- **Key Activities:**
 - Review & update wave measurement requirements as necessary
 - Expand number of global and regional participants
 - Expand verification scope to spatial, spectral, satellite
- **Timeline/milestones:**
 - GlobWave meeting (Nov'12)
 - ETWCH (Apr'13)
 - Plan for expansion to spectral and satellite intercomparison (May'13)
- **ETs, Other Organizations and participants:**
 - ETWCH, ECMWF, ESA, NOPP(US)
- **Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)**
 - 8.1.3 (liaison with ECMWF & GlobWave for wave verification)

Project #12: Wave measurement evaluation and test

Project Leader(s): Val Swail, Bob Jensen, Boram Lee

Project Description:

A workshop co-sponsored by JCOMM/ETWCH and the International Association of Oil and Gas Producers (OGP) (New York, October 2-3 2008) on *in situ* wave measurement technology (see <http://www.jcomm.info/WaveBuoys>). noted that: (1) geographical coverage of *in situ* data is still very limited especially as far as any measure of wave directionality is concerned, and most measurements are taken near coasts in the Northern Hemisphere; (2) present *in situ* reports are not standardized resulting in impaired utility; (3) significant differences exist in measured waves from different platforms, sensors, processing and moorings. Three main topics were discussed: (1) how to add wave observing capabilities to drifting buoys; (2) how to assess and improve the quality of observations from the present networks of moored buoys; 3) the addition of wave observation capabilities to future moored buoy networks. Following the workshop recommendations, ETWCH-DBCP established joint pilot efforts to coordinate an evaluation of various wave measurement systems in order to contribute to a description of best practices for wave measurement, and to investigate the feasibility of making spectral wave measurements from inexpensive drifting buoys. Details of this joint wave measurement evaluation effort can be found on the project web site, www.jcomm.info/WET. The WET project is well underway, with initial comparison results available on the web, with more to follow as data is retrieved from the various co-deployments around the world oceans.

- **Expected Outcomes:**
 - Guidance on best practices for wave measurement to WIGOS/WIS
- **Key Activities:**
 - Lead DBCP Pilot Project on wave measurement evaluation and test (PP-WET)
 - Review & update wave measurement requirements as necessary
 - Participate in, and provide guidance to intercomparison exercise & analysis
- **Timeline/milestones:**
 - Continue analysis and online dissemination of intercomparison results (ongoing)
 - Presentation, side meeting and Report to DBCP-28 (Oct'12)
 - Presentation, side meeting and Report to DBCP-29 (Sep'13)
 - Establish Terms of reference for ongoing coordination group (Sep'13)
- **ETs, Other Organizations and participants:**
 - ETWCH, DBCP , Scripps, OGP, Environment Canada, USACE
- **Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)**
 - 5.2.3 (PP-WET)

Project #13: Capacity Development

Project Leader(s): *Boram Lee, Kevin Horsburgh, Vasiliy Smolyanitsky, Gary Brassington, Henri Savina*

Project Description:

Capacity Development (CD) remains a core activity at the heart of most JCOMM activities. All individual projects have some capacity development aspects, whether these be high level scientific and technical workshops, hands on training activities, or Guides, Manuals and other guidance and training materials, including online course material.

At its fourth Session of JCOMM in May 2012, it was decided that focused efforts should be made for preparation and management of technical guidance material in conjunction with the regular review and update of the Guides and Manuals (addressed within other SFSPA projects). Also, Specific project related training and capacity development are described under the individual projects, particularly to serve for Members' / Member States' capacity development and technology transfer needs.

Opportunities for training and technology sharing include the joint workshops supported by JCOMM and the Tropical Cyclone Programme (TCP) – to provide hands on training on operational wind wave and storm surge forecasting, and to contribute to the ongoing development of the Storm Surge Watch Scheme (SSWS), as well as joint workshops on sea ice analysis.

Expected Outcomes:

- Support Capacity Development workshops
- Publish and update the Guides on marine meteorology and oceanography, including those on marine meteorological services, ocean forecast systems, waves and storm surge forecasting

Key Activities:

- Support JCOMM-TCP training workshops on wave and surge forecasting
- support for “Ice Analysts Workshop” on regular scale (1-2 interval)
- support for sea-ice training documentation and courses including COMET modules and manual for ice experts – ice observers.
- Support METAREA Coordinators and Issuing Services in supporting Maritime Safety Services

Timeline/milestones:

- 4th JCOMM “Ice Analysts Workshop” (St.Petersburg, Jun/Jul'13)
- 8th JCOMM-TCP Training Workshop on Storm Surge and Wave Forecasting, for East Africa (Nairobi, Nov'12)
- 9th and 10th JCOMM-TCP Training Workshops on Storm Surge and Wave Forecasting (venue and time TBD)
- Maritime Safety Services Enhancement Workshop, for METAREA coordinators and Issuing Services, in conjunction with IHO/WWNWS session (2014, NZ)

ETs, Other Organizations and participants:

- ETWCH, TCP, ETSI, ETOOFS, ETMSS COMET

Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)

- 8.1.11 (training)
- 8.2.3 (continuing JCOMM-TCP workshop series)
- 9.5 (workshop in Africa)
- 9.9 (harmonized training responding to Members'/Member States' needs)
- **[need to include other references]**

Project #14: Coastal Inundation Forecast Demonstration Project (CIFDP)

Project Leader(s): *Val Swail, Don Resio, Boram Lee*

Project Description:

Coastal disasters are a major concern for the lives and livelihoods of people, and socio-economic development, in low-lying, highly-populated coastal areas. The management of risk for coastal disasters represents a great challenge to scientists and policy makers in Meteorology, Hydrology, Oceanography, Emergency Management and Coastal Planning. With a view to improving safety-related services for the community, as a fundamental priority of the WMO, the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) and the WMO Commission for Hydrology (CHy) have initiated this Project in order to meet the challenges of coastal communities' safety and socio-economic sustainability through the development of coastal inundation forecasting and warning systems at the regional scale.

JCOMM-4 adopted a general strategy for a CIFDP project as follows:

The Project would be implemented under each regional/national sub-project, launched for a country that meets the essential requirement for initiating a national agreement between national institutions with relevant responsibilities, and the provisional establishment of a National Coordination Team (NCT) that includes operator(s) of the National Meteorological and Hydrological Service (NMHS). The Project would be designed 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 has the responsibility/authority for 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 interests, and should be closely linked to and cooperating with related projects and activities, such as the regional Severe Weather Forecasting Demonstration Project in building a "cascading forecasting process" to produce services for coastal zones.

- **Expected Outcomes:**
 - provide an example of cooperative work as a strategy for building improved operational forecast and warning capability for coastal inundation, combining extreme waves, surges and river flooding events that can be sustained by the responsible national agencies
- **Key Activities:**
 - Develop national sub-projects for countries which establish a national agreement
 - Continuously revise and update the CIFDP Implementation Plan (IP) and progress in national sub-projects
 - Continuously review and update technical recommendations, and identified national/regional requirements
- **Timeline/milestones:**
 - Project Steering Group meeting #4 (Feb'13) review progress, revise IP
 - Review CIFDP-B phase 1 (Feb'12), review CIFDP-DR phase 1 (Dec'12), initiate CIFDP-F (for Fiji) phase 1 (Feb'12).
 - Consider possible new sub-projects - Indonesia (May'13), South Africa (May'13)
- **ETs, Other Organizations and participants:**
 - ETWCH, CHy
- **Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report)**
 - Overall actions derived under 8.2 (CIFDP implementation)
 - 8.2.8 (liaison with related teams/activities)
 - 8.2.9 (Exploring synergies with GODAE)

Project # 15: Revision overall structure of WMO No. 558 & WMO No. 471 and preparation guidelines for Members applying for Preparation / Issuing Service

Project Leader(s): Henri Savina (Lead), Ming Ji, Nick Ashton, Neal Moodie, John Parker, Tim Rulon

Project Description:

The 2012 edition of the Manual on Marine Meteorological Services (WMO-No. 558: <http://www.jcomm.info/558>) includes all required changes recognized until the 3rd session of JCOMM. Additional changes adopted during JCOMM-4 will be included as addenda/corrigenda until new edition is released. Volume I, Part IV (training in the field of marine meteorology) as well as Volume II (regional aspects) of the Manual has not been appropriately updated yet to reflect the recent development over two decades.

The latest official version (2001) of the Guide to Marine Meteorological Services (WMO-No.471) was under the review. The new edition of the Guide is planned to be published before the end of 2013.

The overall structure of the Manual on and Guide to Marine Meteorological Services will be reviewed to reduce redundancies & inconsistencies and identify need, if any, new components to be added. Recommendations will be made to simplify the structure of reference publications. In addition, to fill a gap, new guidelines for Members willing to apply to be new Preparation / Issuing Service will also be proposed.

- **Expected Outcomes:**
 - Updated documentation
- **Key Activities:**
 - Update documentation
- **Timeline, Major milestones:**
 - New guidelines for circulating among Issuing Services – June 2013
 - Revision of overall structure and recommendations – Dec. 2013
- **ETs, Other Contributing Organizations**
 - ETMSS, SFSPA chair & vice-chair, IHO, IMO

Project #16: Standardization format(s) for met-ocean MSI in text format

Project Leader(s): Henri Savina (Lead), Neal Moodie, John Parker, Vasily Smolyanitsky, Bruce Hackett, Giovanni Coppini

Project Description:

In addition to the definition of the first version of the catalogue on Met-Ocean Object Class for Registration in IHO S-10x, and the engagement with IHO and TSMAD for the creation of a IHO Domain for a Met-Ocean Feature (project # 20), the standardization of format(s) for met-ocean MSI in text format would also allow this information to be decoded and displayed on Electronic Navigation Charts (ENC). This will contribute to provide a low-cost option for on-demand approaches that are compatible with e-Navigation, as suggested by the WMO Executive Council, at its sixty-first session (Geneva, June 2009),

- **Expected Outcomes:**
 - Updated documentation
- **Key Activities:**
 - Updated documentation
- **Timeline/milestones:**
 - First set of guidelines – June 2014
- **ETs, Other Organizations and participants:**
 - ETMSS, IHO, IMO

Project #17: Update the joint manual on MSI and IMO Resolution A.705

Project Leader(s): Henri Savina, Nick Ashton (appropriate support needed from the WMO Secretariat)

Project Description:

The World-Wide Metocean information and Warning Service (WWMIWS) and METAREA Co-ordinators have been officially adopted by WMO and IMO. Appropriate actions, in strong cooperation with IHO/WWNWS, will be planned to update accordingly the Joint IMO/IHO/WMO documentation, especially the Joint Manual on MSI and the IMO Resolution A.705(17) on the Promulgation of Maritime Safety Information to integrate the appropriate references to the WWMIWS and to the METAREA Co-ordinators

- **Expected Outcomes:**
 - Updated documentation
- **Key Activities:**
 - Update documentation, in cooperation with IHO
- **Timeline, Major milestones:**
 - ETMSS-4 – Feb. 2013
 - IHO/WWNWS-5 – Oct. 2013
 - Annual IHO doc review meetings (2014,...)
 - Annual IHO/WWNWS session (2014,...)
- **ETs, Other Contributing Organizations**
 - ETMSS, SFSPA vice-chair, IHO

Project #18: Conduct Online Survey every 2 years

Project Leader(s): Henri Savina (appropriate support needed from the WMO Secretariat)

Project Description:

A critical activity for forecast providers is engagement with the user community to improve awareness of the product suite, encourage update, validate requirements and monitor impacts. This is also an essential component of QMS. The measurement (or estimation) of the usefulness and impacts of the provision of MSI or other services is a complex and multi-faceted process, involving surveys and user feedback, through regular written questionnaires (as was now the case), on-line surveys through the website, and direct feedback from ships masters, owners and agents. The on-line questionnaire developed by the WMO Secretariat will be used to conduct surveys more frequently, typically every two years. Surveys will be conducted in 2013/2014 & 2015/2016, and analysis prepared for consideration by JCOMM-V. Part of this feedback already include basic information on who is actually using the MSI provided through the GMDSS; and if the information is not being regularly used, why not, what alternatives are used, and why. Such feedback represents essential information for both WMO and IMO in improving the value of their services to users. In the meantime, the questionnaire should be amended as appropriate (or additional questionnaire be developed) in particular to monitor the provision of services for SAR and MAES applications by ETMSS and ETOOFS. In addition, both ETs should continue to work with IHO and the WWNWS to consider the possibility to develop a common survey methodology, to provide the feedback necessary for performance assessment of the system.

• **Expected Outcomes:**

- User survey and analysis on new and existing services
- Documented user requirements

• **Key Activities:**

- Conduct surveys on user requirements every 2 years
- Analyze survey data
- Update the survey as appropriate (marine weather and ocean forecasting service needs, cooperation with IHO)

• **Timeline, Major milestones:**

- Review and adapt, if appropriate, the questionnaire – ETMSS-4, Feb. 2013
- Finalization of next questionnaire – Sept. 2013
- Presentation to IHO/WWNWS-5 (Oct. 2013)
- Announcement of the next survey – Dec. 2013
- Analysis of responses – 2014

• **ETs, Other Contributing Organizations**

- ETMSS, ETOOFS, WMO Secretariat, IHO

Project #19: Disseminate MSI on GTS and the GMDSS website

Project Leader(s): Henri Savina

Project Description:

The JCOMM GMDSS-Weather Website (<http://weather.gmdss.org>) continues to provide access, in complement to the official dissemination channels, to the in-force official Maritime Safety Information (scheduled forecasts and warnings) prepared for the GMDSS. Météo-France has developed, manages and hosts this website, which has been in operation since 2004. Most of the MSI prepared for SafetyNET dissemination by the METAREA Issuing Services are included (the messages prepared for the Arctic to be added when available). A number of NAVTEX bulletins (around 10 %) are also already available (e.g., METAREAs I, II, III, IV and XI) [see for example <http://weather.gmdss.org/II.html>]. The aim is to provide access to most of the NAVTEX products in the near future. In this context, Issuing Services are urged to ensure that NAVTEX messages prepared for transmitters within their area of responsibility are available on the GTS and to collect the related metadata for inclusion on the GMDSS website. The objective is to reach a rate of 80 % before JCOMM-V.

• **Expected Outcomes:**

- Inclusion of significant part of the MSI prepared for NAVTEX dissemination
- Link to graphical products (e.g., IPY website)

• **Key Activities:**

- Make necessary arrangements for the availability of the NAVTEX products on the GTS
- Collection of metadata related to the NAVTEX products

• **Timeline, Major milestones:**

- Ongoing activity

• **ETs, Other Contributing Organizations:**

- ETMSS and all Member States concerned

Project #20: Catalogue on Met-Ocean Object Class for ENC and e-Navigation

Project Leader(s): NOAA, *Henri Savina*

Project Description:

Since 1999, ETMSS has been working on the implementation of graphical/numerical Maritime Safety Information (MSI) broadcast within the GMDSS. The WMO Executive Council, at its sixtieth session (Geneva, June 2008) re-emphasized the continuing importance to mariners in receiving graphical products via radio transmissions and requested JCOMM to continue researching methods for transmitting graphical products to marine users. On the other hand, the WMO Executive Council, at its sixty-first session (Geneva, June 2009), encouraged WMO Members to investigate low-cost options for on-demand approaches that are compatible with Electronic Navigation Charts (ENC). In addition, the imminent increase of ENC systems on SOLAS vessels as regulatory material and the emergence of the e-navigation concept within IMO should reinforce the priority given to this requirement and the need to find appropriate resources to develop a suitable service. Both the ETMSS and ETSI have been working on this issue and ETSI has already developed the *Sea Ice Objects Catalogue* in accordance with IHO standards. The ETMSS has initiated the development of a catalogue on *Met-Ocean Object Classes and Attributes*, which would be an essential tool to enable NMHSs to develop products specifically for Electronic Navigation Chart Systems, allowing the implementation of software to decode and display met-ocean information by the manufacturers of these systems, using the S-57 and S-100 chart data exchange standards.

The IMO e-Navigation concept reinforce the need to go forward on this issue, to be able to finalize the catalogue on Met-Ocean Object Class for ENC and e-Navigation, especially for parameters included in MSI. A strong support and contribution from ETSI is expected, as the Team has already developed such catalogue for sea ice. WMO, through the Secretariat and ETMSS, need also to be proactive in dealings with IHO and IMO on e-navigation development, to ensure compatibility between e-navigation and future metocean services by Members.

- **Expected Outcomes:**

- Met-Ocean object class for parameters included in MSI (wind, wave height, etc...) and additional met-ocean parameters (surface current,...), based on templates from the Ice Objects Catalogue.

- **Key Activities:**

- Establish the first version of the catalogue for registration in IHO S-10x
- Engage with IHO and TSMAD for the creation of a IHO Domain for a Met-Ocean Feature Catalogue

- **Timeline/milestones:**

- Feb 2013: ETMSS-4
- June 2014: Finalize the first version of met-ocean object class

- **ETs, Other Organizations and participants:**

- NOAA (lead), ETMSS (H. Savina, B. Hackett, G. Coppini, J. Parker, N. Moodie), ETWS, ETSI, IHO, IMO

Project #21: Facilitate implementation of QMS among members of the provision of MSS

(This project is moved to MAN work plan)

Project Leader(s): Bryan/Henri

Project Description:

Quality Management Systems (QMS) for aviation has been undertaken within a global regulatory environment. If such regulations do not presently exist for marine services, IMO is moving in this general direction. In order to ensure the use of best practices and the improvement of value for mariners, JCOMM promotes the implementation of Quality Management Systems (QMS) within the NMS preparing MSI. JCOMM should take the lead within WMO in the provision of support to developing countries in implementing QMS as they further develop their marine services. A process for moving forward will be prepared and guidelines for implementation of QMS by Issuing Services will also be drafted by Bryan Boase, member of MAN with specific responsibility for QMS. Those documents will be reviewed by ETMSS and MAN.

As a first step, a QM training, focussed on Internal Audit procedures, was provided to Issuing Services by a QM specialist supporting the Australian Bureau of Meteorology during the Workshop for Enhancement of Maritime Safety Services in May 2010. That allowed awareness and demystification of QMS practices for participants, and acquisition of an insight into the practical implementation of a QMS within an NMHS. Participants were formally provided with an *"introduction to internal QM auditing processes"* certificate at the end of this item, which indicated they had had an introduction to internal QM auditing processes.

- **Expected Outcomes:**
 - COMET training module for QMS
 - Pilot QMS projects at developing NMHSs
- **Key Activities:**
 - Develop COMET training module for QMS
 - Initiate pilot projects at developing NMHS to implement QMS practice
- **Timeline, Major milestones:**
 - COMET training module (dates?)
- **ETs, Other Contributing Organizations:**
 - ETMSS, ETSI, MAN, COMET

Project #22: Develop guidelines for marine volcanic ash advisory

Project Leader(s): Henri Savina, Tim Rulon

Project Description:

Volcanic ash floating on the sea surface has the potential to disable a ship's engine through its water intake. It is then important to alert mariners as appropriate if such phenomena is observed or expected. Appropriate guidelines and formats will be prepared to be included in the Manual on Marine Meteorological Services (WMO-No. 558) and/or the Guide on Marine Meteorological Services (WMO-No. 471)

The possibility of cooperation and interaction with VAAC will be investigated.

- **Expected Outcomes:**
 - Update WMO documentation
 - Implementation by Members/Members State, especially for the GMDSS
- **Key Activities:**
 - Preparation for guidance material and update WMO documentation
- **Timeline, Major milestones:**
 - Consultation with secretariat for CBS, CAeM on ongoing activities and interaction with the Volcanic Ash Advisory Committee (VAAC) and role of WMO bodies/programmes - April 2013
 - Prepare a guidelines, as appropriate to the general direction of WMO activities in this area, for METAREA / NAVAREA Coordinators, for warnings related to marine volcanic ash – Dec. 2013
 - Once a general guideline is prepared, discuss with the relevant part of IMO on required actions
 - If appropriate, update of the WMO documentation (2014/2015)
- **ETs, Other Contributing Organizations:**
 - ETMSS, WMO Secretariat

Project #23: Identify measures to provide marine navigational warnings for severe solar magnetic storms

Project Leader(s): Henri Savina, Tim Rulon, Maria Aarino-Frisk

Project Description:

Severe solar magnetic storms can disrupt positioning systems, satellite communications and HF radio communications, and therefore might cause severe disturbance in receiving Maritime Safety Information (MSI). The risk of disturbance will be higher during the approaching peak solar activity period (2012-2013).

It is then important to be able to provide to mariners, as appropriate, information on such radio communications disturbance. As such information will have to be issued as Navigational Warning, appropriate links and exchange mechanisms should be implemented between the Meteorological Centre(s) able to provide forecasts/advisories of solar magnetic storms and the NAVAREA Co-ordinators in charge of preparing and issuing the associated Navigational Warnings. In particular, strong interaction with IHO is needed, to confirm the need to put in place appropriate measures and ensure that the operational dissemination procedure and format of the forecasts/advisories are consistent with the needs of the NAVAREA Co-ordinators to issue the related navigation Warnings to mariners.

- **Expected Outcomes:**
 - Update WMO documentation
 - Implementation of service for IHO
- **Key Activities:**
 - Preparation for guidance document
 - Implementation of the organization between the appropriate Met. Centre(s) and the NAVAREA Co-ordinators
- **Timeline, Major milestones:**
 - Prepare a guideline for NMS that are in charge of providing relevant information for Navigational warnings - Dec. 2013
 - Once a general guideline is prepared, discuss with the relevant part of IMO on required actions
 - Presentation to the IHO/WWNWS
 - When agreed, update of the Joint IMO/IHO/WMO and of the WMO documentations (2014/2015)
- **ETs, Other Contributing Organizations:**
 - ETMSS, IHO/WWNWS

Project #24: Development of Oceanic Emergency Response Support Capability

Project Leader(s): Pierre Daniel, Marina Tonani

Points of contact: Nick Ashton (ET-MSS)
Hendrik Tolman (NOAA)

Project Description:

To enhance the capability of Members/Member States, to include tracking for oceanic releases of radioactive hazard materials. This project specifies the ETOOFS contribution to the Task Team On JCOMM Coordination for Marine Environmental Emergency Responses. This project will review dispersion modeling of radioactive material based on operational ocean forecasting systems in order to identify current best practice. Liaise with ET-MSS and stakeholders to establish the user requirements for dispersion products and services. Compare current best practice relative to the user requirements and make recommendations for closing the performance gap. Contribute the findings to the task team reviewing MPERSS as the coordination for these services.

Expected Outcomes:

- Report on the best practice in dispersion modeling in the global ocean of radioactive material and recommendations for improving the service for any identified gaps between current best practice and user requirements
- Assist the TT & SCG to enhance marine pollution emergency response, with a focus on radioactive material discharge

Key Activities:

- Review the current capabilities of oceanic dispersion modelling and prediction within MPI areas and identify best practices.
- Assist the TT & SCG to liaise with international organisations including IMO, other, to identify the requirements for oceanic discharge of radioactive hazards and make recommendations for addressing the gaps in current best practice;
- To assist in coordination to update maes-mperss.org website for dispersion products and services. To assist in updating the contact points for suppliers of ocean data and drift models operators.

Timeline/milestones:

- Mid-2014 Report to the TT and SCG on current capabilities and best practice in dispersion modelling based on operational ocean forecast systems and recommendations for extending dispersion products and services for radioactive materials to address stakeholder requirements.
- Mid-2014 Work with the TT to submit to the SCG a draft proposal for an international framework for responses to marine radioactive material discharge, as well as a JCOMM work plan that describes; 1) requirements and gaps; 2) primary users of such a service; 3) key players and responsible parties in JCOMM coordination/contribution; and, 4) process and timeline to implement the proposed practice
- End-2014 Assist the TT complete MPERSS update for dispersion and other ocean data services

Expert Teams and/or Other Organizations and participants

- ET-OOFS and ET-MSS
- MPERSS Task Team
- AMOCs and supporting services
- National agencies and forecast providers
- GODAE Ocean View Science Team
- IAEA, IMO, IHO

Project #25: Develop oceanic radioactive hazard tracking system for enhanced MPERSS

Project Leaders: Nick Ashton, Henri Savina, Bruce Hackett

Project Description:

The primary objective of Marine Pollution Emergency Response Support Systems (MPERSS) is to have in place a coordinated, global system for the provision of meteorological and oceanographic information for marine pollution emergency response operations outside waters under national jurisdiction. The areas covered have the same geographical distribution as those for the GMDSS, and Area Meteorological and Oceanographic Coordinators (AMOCs) have been identified for all of them.

The project will review the current framework of MPERSS, particularly the role of the AMOCs, their ToRs and their areas of responsibility, in the context of support to any response to radioactive material discharge; marine pollution monitoring and response or marine SAR;

This project, together with Project #24, may be considered as components of the work of the Task Team On JCOMM Coordination for Marine Environmental Emergency Responses .

Expected Outcomes:

- Work with the TT to submit to the SCG a proposal to streamline the global coordination of marine environmental emergency responses, to ensure that existing capabilities within MPERSS (including Search and Rescue) are not compromised by any reapportionment of resources
- Enhance the visibility and recognition of MPERSS services outside the WMO (e.g., IMO, IAEA)
- In cooperation with the TT and ETOOFS, update the user requirements for MPERSS

Key Activities:

- Coordination with TT, SCG, AMOCs, RSMCs on an oceanic radioactive hazmat tracking framework;
- Develop a proposal for the global coordination of marine environmental emergency responses in cooperation with the TT & SCG

Timeline, Major milestones:

- Submit the proposal to SCG; **by end 2014**

ETs, Other Contributing Organizations:

- TT, ETMSS, ETOOFS, IAEA, IMO, WMO

Project #26 Support and enhance the Polar components of GMDSS

Project Leaders: Darlene Langlois, Nick Hughes, Vasily Smolyanitsky

Project Description:

Polar components of the GMDSS as well as provision of MSI for areas with occurrence of floating ice differ in many aspects from mid-latitude or ice free areas of the World Ocean. Navigation near but outside of the ice and ice navigation needs proper support both for safety and efficiency in terms of regular provision of complex sea ice information, preferably in graphic form. If restricted to current Inmarsat transmissions, the Preparation Services still have limitations in coverage and ability to provide binary information in high latitudes.

Starting with June 2011 the new 5 Arctic METAREAs are put into a Full Operational Capacity with new procedures to support ice edge information in SafetyNET and NAVTEX bulletins and a special "ice" GMDSS server <http://gmdss.aari.ru> to support exchange of information between the Preparation Services.

The objective of the project will be for ETSI to continue with IICWG, ETMSS, IMO and IHO to support and enhance the polar components of GMDSS including the Southern Ocean and under the agreed scheme for IMO e-Navigation including the Polar Code.

Key outcomes:

- sustained and extended bi-polar components of GMDSS and capabilities
- enhanced capabilities for graphic products
- input to IMO on ice and weather safety related input for Polar Code

Key activities:

- support for operational exchange of information for polar GMDSS
- training and harmonization of practices across the Preparation Services, exchange and transition of experience to Southern hemisphere METAREAs, regular "Ice Analysts Workshops", possibly jointly with GMDSS meteorologists
- development, testing and implementation of updates to ice in SafetyNET and NAVTEX standards supporting graphic presentation of information
- support for developing international code of safety for ships operating in polar waters (Polar Code) by providing input on weather and ice safety related to Polar Code development to IMO.

Timeline / Milestones:

- 4th "Ice Analysts Workshop" (Jun/Jul 2013 or later) including session on Southern hemisphere
- Reports to IICWG-14 (Oct'2013, Iceland), ETSI-V (Nov'2013, Canada) and IICWG (Chile, 2014)

ETs, Other Organizations and participants:

- ETSI, ETMSS, IICWG, Preparation Services for METAREAS with floating ice

Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report

- 8.3.4 (Safety-related Marine Meteorological Services)
- 8.3.10 (Safety-related Marine Meteorological Services)

Project #27: Support and enhance ENC/Electronic Chart Display Information System (ECDIS) for ice navigation

Project Leaders: Juergen Holfort (ETSI TG ENCIO and BSH), Vasily Smolyanitsky

Project Description:

Sea ice information is mandatory for presentation on Electronic Navigational Charts (ENC) though the scope of sea ice parameters and presentation mechanisms differ across the IHO standards (MIO, AML and S-10x) and implementations of sea ice presentation in various Electronic Chart Display Information System (ECDIS).

In 2006 the ETSI entered into partnership with the IHO Transfer Standard Maintenance and Applications Development Working Group (TSMAD) and in 2007 adopted the first version 4.0 of the "Ice Objects Catalogue" which was based on the harmonized existing national practices and intended to extend the IHO S-57 standard for sea ice both for 'ice' and 'ice-free' navigation.

During 2007-2011 the Catalogue was tested and implemented in Canadian and Russian manufactured ECDIS along with corresponding presentation library. Results of the activity were regularly reported to TSMAD and presented during JCOMM-IV. Arising requirements from the end-users dictate further amendments to the Catalogue along with its implementation across all corresponding ice services. In 2010 the IHO adopted a new S-100 standard which may be considered to certain extent as a format more flexible for production at the level of ice services and for met-ocean information.

Objective of the project will be to support and enhance ENC/ECDIS capabilities for ice information in S-57 and S-10x formats following extending requirements from the end-users for complex ice navigation services and taking into account the current and perspective work of IMO and IHO in developing the concept of e-Navigation in cooperation with the IICWG and national ice services.

Key outcomes:

- IHO S-10x standard for sea ice
- Capability at National Ice Services to produce ice in S-10x and S-57

Key activities:

- Formal management of Ice Objects Catalogue
- Develop ice standards as IHO S-10x
- Interact with ENCS manufacturers and OGC to develop software to accept ice data
- Support National ice services to develop capability and to begin production of S-57/S-1xx data files
- Support implementation of MetOcean Catalogue as S-1xx

Timeline / Milestones:

- Draft S-107 (or other number 10x) and presentation to IICWG (Oct'2012)
- Preparation of a portrayal registry for parameters of the ice objects catalog (2013)
- Formalization of documentation and reports to ETSI-V (Nov, 2013), IICWG (Oct 2013 and 2014) and TSMAD (Jun 2013 and further)

ETs, Other Organizations and participants:

- ETSI TG ENCIO, BSH, IICWG, TSMAD

Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report

- 8.3.4 (Safety-related Marine Meteorological Services)
- 8.3.10 (Safety-related Marine Meteorological Services)

Project #28: Maintain and update sea ice technical documentation

Project Leader: Vasily Smolyanitsky, Darlene Langlois, IICWG

Project Description:

The WMO sea ice technical documentation is regulating the descriptive (nomenclature and glossaries), coding, exchange and presentation procedures for sea ice cover as well as existing sea ice best practices for observations and services on regional and world-wide scale.

In a broader sense, it would be favorable for observational, operational and research community if the same documentation will be developed for all kinds of floating ice – sea, lake and river ice with all kinds of topology (point, linear, area, grid).

Following requirements from the end-users, in the framework of implementation of CryoNet as well as in connection with anticipated requested from the International Polar Initiative (IPI), ETSI will maintain, update and extend as appropriate the WMO sea ice standards in interaction and cooperation with the International Ice Charting Working Group (IICWG).

Expected outcomes:

- Harmonization and updates to WMO ice documentation following progress in ice in ECDIS standards
- Updates to WMO ice standards in parts of river/lake ice/point/linear/gridded objects
- Documentation on ice observations and best practices

Key activities:

- Updates to “Sea Ice Nomenclature” (WMO-No.259) catching harmonization (Vol I – “Terminology” and Vol III - “International system of sea-ice symbols”) and training issues (vol. II - “Illustrated Glossary”);
- Updates to sea ice exchange and presentation formats (“SIGRID-3: a vector archive format for sea ice charts”, WMO/TD-No. 1214 and “Ice Chart colour code standard” WMO/TD-No. 1215);
- Developing “Understanding and Identifying Old Ice in Summer”, “Manual for Ice Experts – Ice Observers” and others docs (e.g. Canadian MANICE) as the new WMO sea publications for sea ice observations and analysis;
- Provide harmonization across the sea ice standards arising from adopted additions

Timeline / Milestones:

- Finalize additions arising from the “Ice Objects Catalogue” version 5.1” (ETSI-V, Nov 2013)
- Finalize additions on ice objects arising from end-users, Cryonet and ice observations requirements (ETSI-V, Nov 2013, IICWG, 2014)

ETs, Other Organizations and participants:

- ETSI, IICWG, CryoNet team

Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report

- 8.3.4 (Safety-related Marine Meteorological Services)
- 8.5 (Future priorities for the services and forecasting system programme)

Project #29 Support for sea ice climatology and ice information systems

Project Leader: Vasily Smolyanitsky, Caren Panowicz, IICWG

Project Description:

Based on a variety of sources, including the ice air reconnaissance introduced for the Arctic as early as in 1920s, ice charting material provides a unique opportunity to significantly extend our knowledge on variability of ice conditions in space prior to commencement of global ice cover monitoring based on passive microwave imagery in 1978.

The ice charts are still capable to deliver information on such sea ice parameters which are absent or poorly assessed with the help of automatically processed satellite data. That includes but is not limited to fast ice extent, stages of development, etc. Modern and most of the reprocessed historical ice charting material is based on a single WMO sea ice standard – “WMO Sea-Ice Nomenclature” (WMO, 1970).

In 1989 the WMO CMM initiated the “Global Digital Sea Ice Data Bank” (GDSIDB) project to support development of the sea ice climatology based on the ice charting with 2 archival centers – AARI, Russia and NSIDC, USA. Since 2001 the JCOMM Expert Team on Sea Ice in cooperation with the International Ice Charting Working Group (IICWG) is supervising the project and cooperates with JCOMM ETMC.

Since 1990s most of the ice services including BSIS, Canada, Japan, Russia, USA, are contributing to the project. Presently most of the ice charting data prior to 2000s is stored in a 0.25°x0.25° raster SIGRID, SIGRID-2 (WMO, 1989 and 1994) or Ease-grid formats, while after 2000s the data is stored in a more flexible vector SIGRID-3 format (WMO, 2004) and are available either via the AARI (<http://wdc.aari.ru/datasets>) or NSIDC (<http://nsidc.org>).

The project will concentrate on a) reprocessing and update of the sea ice ‘blended’ climatology and assessment of uncertainties and b) availability of the sea ice charting metadata and material in information systems and formats required by end-users community (CryoNet, WIS, NetCDF).

Expected Outcomes:

- Updated semicentennial and longer sea ice ‘blended’ climatology and uncertainties
- Availability of sea ice operational and historical metadata and material in WIS, Cryonet and other information systems and as geoservices

Key Activities:

- Regular (weekly – monthly - annual) input to GDSIDB ice charting archive in standard WMO formats from contributing ice services / centers
- Annual reprocessing of data, update of climatology, assessment of uncertainties and comparison with passive microwave
- Coordination of development of protocols and procedures for sea ice charting metadata/material availability in WIS, Cryonet, static NetCDF, geoservices, etc and supporting documentation

Timeline/milestones:

- Report to IICWG (October 2013, 2014)
- Report to Cryonet (2013)
- Report to ETSI and decision on information systems and access (ETSI-V, Nov 2013)

ETs, Other Organizations and participants:

- ETSI, ETMC, IICWG, CryoNet team

Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4 report

- 5.4.3 (Polar Met-Ocean and sea ice information services)
- 8.3.4 (Safety-related Marine Meteorological Services)

Project #30 Task Team on JCOMM Coordination for Marine Environmental Emergency Responses

Task Team Leader: Nick Ashton

Task Team Members: Henri Savina (France)
Bruce Hackett (Norway)
Giovanni Coppini (Italy)
Marina Tonari (Italy)
Pierre Daniel (France)
JMA Representative (Japan)

Project Description:

The Task Team has been established in response to the recommendation that JCOMM (JCOMM-4, May 2012) should take a proactive role in supporting Members / Member States in responding to marine environmental emergencies. This should include supporting responsible centres to extend their technical capabilities, exchange diagnostic and forecast data, as well as provide enhanced coordination for services and information provision in a way that meets requirements as defined by the International Atomic Energy Agency (IAEA) and International Maritime Organization (IMO).

Expected Outcomes:

- A draft proposal for an international framework for responses to marine radioactive material discharge, as well as a JCOMM work plan that describes; 1) requirements and gaps; 2) primary users of such a service; 3) key players and responsible parties in JCOMM coordination/contribution; and, 4) process and timeline to implement the proposed practice;
- Submit to the SCG a proposal to streamline the global coordination of marine environmental emergency responses, to ensure that existing capabilities within the Marine Pollution Emergency Response Support System (MPERSS), including Search and Rescue, are not compromised by any reapportionment of resources

Key Activities:

- Review available technologies for modeling, forecasting, and operational support of radioactive material discharge in marine environments, in view of exploring feasibility of providing enhanced coordination in basin scale;
- Assist the SCG to liaise with international organizations, including IMO, IAEA and others, on the requirements for the delivery of information in support of radioactive material discharge;
- Review the current framework for MPERSS for the high seas, particularly the role of the Area Meteorological and Oceanographic Coordinators (AMOCs) and their applicability, in the context of support to any response to radioactive material discharge; marine pollution monitoring and response or marine SAR

Timeline, Major milestones:

- Draft proposal for an international framework for responses to marine radioactive material discharge; **by mid 2014**;
- Proposal to streamline the global coordination of marine environmental emergency responses; **by end 2014**.

ETs, Other Contributing Organizations:

- ETMSS, ETOOFS, IAEA, IMO, WMO & other UN Agencies as appropriate.

Project #31 Enhancing the integrated ice services and forecasting

Project Leaders: Vasily Smolyanitsky, Nick Hughes

Project Description:

Provision of services for efficiency and safety of navigation and other operations in the ice-covered waters require integrated approach in terms the ice and sea state parameters and products to be regularly, timely and in the binary formats delivered to end-users (navigators, off-shore platforms, search and rescue, emergency support). Typical scope of parameters should include concentration, stages of development or thickness, form, dynamic processes (ice drift, pressure) and ice surface state (ridges, melt processes, snow on ice) as well as several metocean parameters, while the products should include both ice analysis or charting, high and medium resolution satellite imagery and short-term numerical ice forecasting. SAR and emergency support may require additional products like medium-term ice and metocean forecasting and numerical forecasting of the oil spill dissemination. Possible changes to concept of ice support towards greater demands to products beyond the ice charting are progressing.

The objective of the project will be for ETSI in tight collaboration with the International Ice Charting Working Group (IICWG) to coordinate enhancement of integrated ice services by tracking and summarizing best practices and requirements to products and information, facilitating exchange of experience and resources in ice analysis, operational forecasting and numerical modeling of ice and related to ice parameters and harmonization of the services. This project should provide advice and input to corresponding projects led by JCOMM ETOOFS and TT on MPERSS.

Key outcomes:

- enhanced ice services following user-requirements
- enhanced ice diagnostic and forecast products beyond the ice charting
- input to MPERSS implementation in Polar Regions

Key activities:

- tracking and summarizing requirements to input data (current and perspective spaceborne information and ground observations) and products;
- updates (every ~1-2 years) of national best practices in “Sea-Ice Information Services in the World” (WMO-No.574), preferably compatible with the WMO-No. 9, Volume D;
- exchange and transition of experience in ice analysis, forecasting and harmonization of practices across the Services, training for developing Ice Services, including support for regular “Ice Analysts Workshops” and “Ice Assimilation Workshops”.
- Input to ETOOFS guide ?

Timeline / Milestones:

- 4th “Ice Analysts Workshop” (Jun/Jul 2013 or later)
- 2013 and further updates to WMO-No.574 (mid 2013, 2015)
- Update to WMO RRR;
- Reports to IICWG-14 (Oct’2013, Iceland), ETSI-V (Nov’2013, Canada) and IICWG (Chile, 2014)

ETs, Other Organizations and participants:

- ETSI, IICWG, met.no and AARI for oil spills (?)

Implementation of JCOMM-4 decisions (noted by paragraph number of JCOMM-4) report

- 8.3.4 (Safety-related Marine Meteorological Services)
 - 8.3.10 (Safety-related Marine Meteorological Services)
-

**TERMS OF REFERENCE
FOR THE AD HOC TASK TEAM ON JCOMM COORDINATION FOR
MARINE ENVIRONMENTAL EMERGENCY RESPONSES**
(as agreed at SCG-7, 4-6 March 2013, Tokyo, Japan)

At the 4th session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM-4, May 2012), Members / Member States agreed that JCOMM should take a proactive role in supporting Members / Member States to respond to marine environmental emergencies. This should include supporting responsible centres to extend their technical capabilities, exchange diagnostic and forecast data, as well as provide enhanced coordination for services and information provision in a way that meets requirements as defined by the International Atomic Energy Agency (IAEA) and International Maritime Organization (IMO).

A system that tracks oceanic radioactive plumes using dispersion modelling should leverage the existing framework for tracking atmospheric radioactive hazards in operational NWP centres, operated in conjunction with atmospheric dispersion modelling infrastructures and expertise.

To pursue this objective during the intersessional period (2012 – 2017), the ad hoc Task Team will undertake the following work, and will report directly to the Services and Forecasting Systems Coordination Group (SCG). The Task Team will be active during the defined period to accomplish the tasks described below, mainly through the online correspondence, and in general with no resource implications to JCOMM:

1. Review available technologies for modelling, forecasting, and operational support of radioactive material discharge in marine environments, in view of exploring feasibility of providing enhanced coordination in basin scale; **by mid 2014**;
2. Assist the SCG to liaise with international organizations, including IMO, IAEA and others, on the requirements for the delivery of information in support of radioactive material discharge; **continuous until end 2014**;
3. Submit the SCG a draft proposal for an international framework for responses to marine radioactive material discharge, as well as a JCOMM work plan that describes; 1) requirements and gaps; 2) primary users of such a service; 3) key players and responsible parties in JCOMM coordination/contribution; and, 4) process and timeline to implement the proposed practice; **by mid 2014**;
4. Review the current framework for Marine Pollution Emergency Response Support System for the high seas (MPERSS), particularly the role of the Area Meteorological and Oceanographic Coordinators (AMOCs) and their applicability, in the context of support to any response to radioactive material discharge; marine pollution monitoring and response or marine SAR; **by end 2014**;
5. Submit the SCG a proposal to streamline the global coordination of marine environmental emergency responses, to ensure that existing capabilities within MPERSS (including Search and Rescue) are not compromised by any reapportionment of resources; **by end 2014**.

Team Members:

Nick Ashton (UK) - Leader
Henri Savina (France)
Bruce Hackett (Norway)
Giovanni Coppini (Italy)
Marina Tonari (Italy)
Pierre Daniel (France)
JMA Representative (Japan)

LIST OF ACTIONS

Item	Action	By whom	When/target
2.4, 5.2	provide input to the Management Committee for the internal review of the draft marine competency requirements (to be submitted by TT-MCR)	SCG led by ETMSS	when the draft document is submitted and not later than December 2013
3.3	regularly report SCG on the progress in implementation of workplan, with a view to achieving the goal following the agreed timeline	all Teams and experts	continuous during the intersessional period
3.4(a), P#1	involve various expert groups in the review process for the new OOFs Guide	ETOOFs	continuous until 2016
3.4(a), P#1	review the draft OOFs Guide and provide feedback	all SCG members	by ETOOFs-4 (for 1 st draft) and continuous until 2016
3.4(b), P#2	organize review of the marine and ocean components of current SoG and RRR, in advance to providing input to IPET-OSDE, and prepare harmonized and consolidated comments out of those from different Teams	G.Brassington, K.Horsburgh and A.Mafimbo	July 2014 (before IPET-OSDE session)
3.4(c), P#3	discuss with the Expert Team on Extended and Long-range Forecasting (ET-ELRF) on the SoG for Seasonal to Inter-annual Forecasts	M.Ji and G.Brassington	by ETOOFs-4 in March 2013
3.4(d), P#9	Lead planning for the 2 nd Storm Surge Symposium, to be held during the intersessional period	ETWCH with K.Horsburgh lead	ASAP and by December 2013
3.4(f), P#14	consider an efficient way of distributing experts' time and involvement in CIFDP implementation	CIFDP PSG and Secretariat	ASAP
3.4(l), 5.11(a), P#25, P#30	Include recommended changes on SAR support (by the new task team) in the next revision of the WMO-No.558	WMO Secretariat	by the next revision of WMO-No.558 (after reception of recommendations, end 2014), from 2015 but before JCOMM-5
4.6, P#25	to report to SCG on the results/deliverable of the task team on JCOMM coordination for environmental emergency response, in the given timeline	N.Ashton	by mid 2014 and December 2014

Item	Action	By whom	When/target
4.7	To move information in the MPERSS web site (http://www.maes-mperss.org) to jcomm.info	by Secretariat in coordination with Pierre Daniel (Meteo-France)	ASAP and before May 2013
5.6	to work with the Co-presidents and Management Committee to provide clear documentation on JCOMM contribution to GFCS, mapped on to GFCS elements	all SCG members led by Coordinator	by MAN-10 (May 2013)
5.10	Publish addenda for WMO-No.558, based on the agreed modification at JCOMM-4	identified ETMSS members (for review), with H.Savina lead, and WMO Secretariat	ASAP and before end 2013
5.10	Publish new edition of WMO-No.471, reflecting changes made since 2001 until present	ETMSS members (for review) and WMO Secretariat	ASAP and before end 2013
3.4(l), 5.11, P#25, P#30	carry out review and revision of WMO-No.558 for the identified parts, through the "fast-track" process	ET members and WMO Secretariat	ASAP and before end 2014 following the agreed schedule for each task
3.4(m), P#26, P#27,	regularly review and revise WMO-259, WMO-574 and WMO Td.1214 & 1215 through the "fast-track" process with JCOMM TR numbering	ETSI (review), WMO Secretariat	End 2014 and continuous
5.12	Complete provision of JCOMM input to WMO-No.485 (GDPFS) – marine meteorological services	ETMSS (H.Savina) and WMO Secretariat (E.Cabrera)	by end March 2013
5.14	plan a workshop/seminar of national and regional centres conducting MPERSS-related duties	SCG with ETMSS lead	from 2015, before JCOMM-V
5.3, 6.2	draft a work plan for WMO-IMO-IHO coordination during the intersessional period including responsible persons, key issues and timeline	led by N.Ashton and M.Ji working with H.Savina, V. Smolyanitsky and WMO Secretariat	ASAP and by September 2013
6.3	continue and extend effort to identify vice-chairs for the Teams and Groups, and distribute responsibilities for intersessional workplan implementation	all Teams and Group (* ETOOFS)	Continuous

ACRONYMS AND OTHER ABBREVIATIONS

AMOCs	(MPERSS) Area Meteorological and Oceanographic Coordinators
CAeM	WMO Commission for Aeronautical Meteorology
CAgM	WMO Commission for Agriological Meteorology
CD	Capacity Development
CHy	WMO Commission for Hydrology
CIFDP	WMO Coastal Inundation Forecasting Demonstration Project
COMET	(USA) Center for Online Medical Education and Training
COWCLIP	(JCOMM-WCRP) Coordinated Wave Climate Projection
DBCP	Data Buoy Cooperation Panel
DRR	Disaster Risk Reduction
EMSA	European Maritime Safety Agency
ENC	Electronic Navigational Charts
ET	Expert Team
ET-EGOS	Expert Team on Evolution of the Global Observing Systems
ET-ELRF	Expert Team on Extended and Long-range Forecasting
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
GFCS	Global Framework for Climate Services
GHR SST	Group for High Resolution Sea Surface Temperature
GMDSS	Global Maritime Distress and Safety System
GODAE	Global Ocean Data Assimilation Experiment
GOV	GODAE OceanView
GOVST	GODAE Ocean View Science Team
GTS	Global Telecommunication System
ICAO	International Civil Aviation Organization
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IPET-OSDE	(WMO CBS) Inter-Programme Expert Team on the Observing System Design and Evolution
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JMA	Japan Meteorological Agency
MAN	JCOMM Management Committee
METAREA	Meteorological Area (GMDSS)
MPERSS	Marine Pollution Emergency Response Support System for the high seas
MSI	Maritime Safety Information
NMHS	National Meteorological and Hydrological Service
OSTST	Ocean Surface Topography Science Team

PA	Programme Area
PSG	(CIFDP) Project Steering Group
QM	Quality Management
QMS	Quality Management System
RRR	Rolling Review of Requirements
RSMCs	Regional Specialized Meteorological Centres
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
SAR	Search and Rescue
SCG	SFSPA Coordination Group
SFSPA	Services and Forecasting Systems Programme Area
SoG	Statement of Guidance
TCP	WMO Tropical Cyclone Programme
ToR	Terms of Reference
TT-MCR	(JCOMM) ad hoc Task Team on Marine Competency Requirements
TT-WCF	CAGM-JCOMM Task Team on Weather, Climate and Fisheries
WMO-No. 471	Guide to Marine Meteorological Services
WMO-No. 485	Global Data Processing and Forecasting System
WMO-No. 558	Manual on Marine Meteorological Services
WMO-No.702	Guide to Wave Analysis and Forecasting
WMO-No.1076	Guide to Storm Surge Forecasting
WWMIWS	IMO/WMO World-Wide Met-Ocean Information and Warning System

