

WORLD METEOROLOGICAL ORGANIZATION

MEETING OF THE COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION TEAM ON PWS (CBS/OPAG-PWS ICT/PWS)

MONTREAL, CANADA, 23-27 APRIL 2012



FINAL REPORT

EXECUTIVE SUMMARY

The “Meeting of the Commission for Basic Systems Open Programme Area Group on Public Weather Services (PWS) Implementation / Coordination Team on PWS (CBS/OPAG-PWS ICT/PWS)”, was held in Montreal, Canada, from 23 to 27 April 2012. In addition to the Chairperson of the OPAG, the meeting was attended by the Chairpersons of the three PWS Expert Teams, the Chairperson of the Inter-Commission Task Team (ICTT) on Meteorological Services for Improved Humanitarian Planning and Response, and the Director-General of the Shanghai Meteorological Service (SMS). The Co-Chairperson of the OPAG tendered his apologies for his inability to attend due to unforeseen circumstances.

The ICT discussed the changes that have been implemented within the OPAG-PWS as part of its re-structuring at the request of CBS-Ext.(10) (Windhoek, Namibia, November 2010). Of particular importance to the OPAG was the positioning of Service Delivery as one of the key Strategic Thrusts of the Organization, and the subsequent adoption by the Sixteenth session of the World Meteorological Congress (Cg-XVI, Geneva, Switzerland, May - June 2011) of the “WMO Strategy for Service Delivery”.

Matters of particular note arose from the reports to the ICT from the Chairpersons of the OPAG, the Chairperson of the ICTT and the Chairpersons of the ETs, and from subsequent discussions, including:

1. While the work of the OPAG would become primarily focused on Service Delivery over the coming years, the name of the OPAG should continue as the OPAG on PWS, while broadening the interpretation of the word ‘public’ in the context of general ‘public good’ interests;
2. At a variety of levels, those active within the OPAG would proactively make contact with colleagues in other OPAGs and other Technical Commissions (TCs) to promote the principles of Service Delivery.
3. The OPAG would actively promote the engagement of Members with the “WMO Register of Alerting Authorities” and with the Common Alerting Protocol (CAP) technology;
4. The work on the “Guidelines for Meteorological Support to the Olympic Games” would soon be brought to conclusion and used as a template for meteorological support to major cultural and sporting events;
5. The work of the Expert Team in Support of Disaster Prevention and Mitigation (ET/DPM), in developing a template Memorandum of Understanding for National Meteorological and Hydrological Services (NMHSs) with Disaster Management Agencies (DMAs), and that of the Expert Team on Communication, Outreach and Public Education Aspects of PWS (ET/COPE), in developing a parallel template Memorandum of Understanding with Media Agencies, showed significant convergence. It was thus agreed to merge these templates into one over-arching template MoU between a National Meteorological Service and a partner agency, and keep it at a high level to allow the NMS to apply it within its own governance structure. This would be supplemented by examples of an MoU with a DMA, and a media organization;
6. The work of the “Inter-Commission Task Team (ICTT) on Meteorological Services for Improved Humanitarian Planning and Response” has made significant progress with two contractors currently employed. The ICTT plans to complete its work within the year and issue a final report, which will include a concrete set of actions;

7. While the Final Report of the World EXPO 2010 Nowcasting Services (WENS) Demonstration Project has been issued, a “Concept Note” for follow-up activities has been drafted and will be further developed by the Shanghai Meteorological Service (SMS) / China Meteorological Administration (CMA); and,
8. The ICT discussed in depth the proposal for the establishment of a “Competency Framework for PWS Forecasters”. The ICT decided to prepare one set of core competencies for PWS forecasting with additional sets of specialized competencies relating to work in the media, in the area of disaster mitigation and cooperation with DMAs, and in the development and improvement of products and services. It agreed to expedite work on the Competency Framework with a view to presenting it to the forthcoming CBS Session in September for consideration and approval.

Among the Deliverables agreed by the ICT are to:

1. assist with the implementation of the Service Delivery Implementation Plan, once it has been approved, and ensure that consequential actions relevant to PWS are carried out;
2. establish contact with and work collaboratively with other OPAGs in CBS, TCs, etc., as required in the furtherance of Service Delivery principles and implementation;
3. facilitate the development of one or a number of “one-stop-shops” for the provision of advice and assistance to the Humanitarian Response community;
4. promote the concept of NMHSs as the “Single Official Voice” at times of severe / high-impact weather;
5. seek detailed feedback from recipients of targeted PWS activities, such as Severe Weather and Forecasting Demonstration Project (SWFDP), Learning-Through-Doing (LTD) Projects, training events, some prototype projects being established related to disaster risk reduction, etc.;
6. develop a “Competency Framework for PWS Forecasters” and activities;
7. develop materials on the Social and Economic Benefits of NMHSs as decided by the Regional Association VI (RA VI, Europe) Task Team and the joint WMO-World Bank Project, as well as any relevant materials resulting from the work of the Societal and Economic Research Applications Working Group (SERA) of WWRP;
8. complete and publish the “Guidelines for Meteorological Support to Olympic Games”;
9. further develop the concept of future activities as a follow-up to WENS;
10. strengthen the involvement of NMHSs’ PWS Focal Points with the work of the OPAG and of the PWS Programme; and,
11. market and promote the availability and use of PWS material among the NMHS / PWS community.

1. OPENING

At the kind invitation of the Government of Canada, a meeting of the Commission for Basic Systems Open Programme Area Group on Public Weather Services (PWS) Implementation / Coordination Team (CBS/OPAG-PWS ICT/PWS) was held in Montreal, Canada, from 23 to 27 April 2012. The meeting was chaired by Mr Gerald Fleming, Chairperson of the CBS OPAG/PWS. The Meeting opened at 0900 hours at the Meteorological Services of Canada (MSC) Headquarters in Montreal. In his opening remarks, Mr Fleming welcomed the participants, and especially Dr Tang Xu, Director-General of the Shanghai Meteorological Service (SMS) who was attending this ICT meeting as a member for the first time. Mr Fleming thanked Mr Michel Jean and the staff of the MSC who had made excellent arrangements for the meeting. Ms Haleh Kootval, the WMO Secretariat representative, welcomed the participants on behalf of the Secretary-General and thanked the MSC for hosting the meeting. Mr Jean welcomed the participants to Montreal and outlined some of the logistical arrangements for the week. He introduced Ms Jennifer Milton and Ms Jacinthe Lacroix of the MSC who would also attend the meeting of the ICT. The Chairperson welcomed the two colleagues from MSC and noted that Ms Milton was already active within the OPAG.

2. ORGANIZATION OF THE MEETING

The Meeting agreed on its working hours as 0900 - 1700 with appropriate time allowed for lunch and coffee breaks.

3. REVIEW OF THE RELEVANT DECISIONS OF CBS-EXT.(10) AND SIXTEENTH WORLD METEOROLOGICAL CONGRESS (CG-XVI), INCLUDING SOCIO-ECONOMIC BENEFITS OF METEOROLOGICAL AND HYDROLOGICAL SERVICES

3.1 Ms Kootval briefed the participants on the most important events that had taken place since the ICT had held its last meeting in Shanghai in 2010. These included the Extraordinary Session of CBS (CBS-Ext.(10)), and the Sixteenth Session of the World Meteorological Congress (Cg-XVI).

3.2 Many of the matters covered under this topic were largely discussed and dealt with under Item 4, the "Report of the OPAG Chairperson".

3.3 The ICT noted that the network of PWS National Focal Points (FPs) had grown to the extent that now more than 50% of NMHSs have appointed individuals to act in this capacity. The ICT was informed that a quarterly newsletter was issued to the FP Network to keep them informed of activities within the OPAG and the PWS Programme. The network formed a resource for gathering and sharing information as well as carrying out surveys relevant to PWS activities and interests.

3.4 The ICT discussed matters related to Service Delivery, and considered how to best promote this concept throughout WMO. Recognizing the establishment of the "WMO Register of Alerting Authorities", and the benefits to be realised through using the CAP to promulgate weather warnings, the ICT agreed to develop a Deliverable on this topic which would include the appointment of a WMO Expert Advisor on CAP issues who might assist the PWS Programme with promoting the engagement with CAP and the "WMO Register of Alerting Authorities", and work with NMHSs on a one-to-one basis on these issues. It was agreed that, while the technology for these initiatives had been well developed and advertised, there was a need to inform and educate Members on the underlying philosophy and capabilities of these initiatives.

3.5 The ICT was informed that an Extraordinary Congress of WMO would be held in October. This would be a three-day event; the sole agenda item would be the Global Framework for Climate Services (GFCS) and the adoption of its Implementation Plan (IP). The GFCS IP identified four Target Areas (Food, Water, Health and Disaster Risk Reduction) and had developed an exemplar for each area. The ICT agreed that the GFCS and the “WMO Strategy for Service Delivery” were closely related and that the PWS community needed to keep abreast of developments in this area.

4. REPORT OF THE OPAG CHAIRPERSON ON ACTIVITIES OF THE OPAG, INCLUDING RELEVANT DECISIONS OF THE CBS-MG MEETING

4.1 The Chairperson reviewed matters relevant to the OPAG which had emerged at meetings of various WMO Sessions over the previous two years, including CBS-Ext.(10), Cg-XVI, Twelfth Session of the CBS Management Group (CBS/MG 12, Geneva, July 2011), WMO RA VI Conference on Social and Economic Benefits of NMHSs (Lucerne, Switzerland, October 2011), and the most recent meeting of the SWFDP Steering Group (SG-SWFDP, February 2012). The Chairperson referred to the work carried out under the WENS Demonstration Project over the previous two years and noted that Dr Tang Xu of the SMS would provide the ICT with a comprehensive overview. The Chairperson also provided a summary of the primary issues which would concern the OPAG over the coming years.

4.2 In relation to the CBS Ext.(10) Session, the Chairperson noted the decision of the Session that the OPAG should have four Expert Teams (ETs), each one aligned with one of the four components of the “WMO Strategy for Service Delivery”. He further noted that, because of financial constraints, the establishment of a fourth ET within the OPAG would not be possible, so that the task of “Monitoring and Evaluation”, the fourth component of the “WMO Strategy for Service Delivery”, would be shared between the three existing ETs and coordinated through the ICT.

4.3 The discussion at Congress on PWS matters was, as usual, lively and largely positive, with a total of 32 interventions on the PWS document. Most NMHSs are fully aware of the need to strengthen user interaction, improve service delivery, and exploit fully the latest media technologies. There was a keen interest among Members in the concept of Societal and Economic Benefits studies, while one Member had raised the issue of the appropriate relationship / distinction between Public Weather Services (public good) and Commercial Weather Services.

4.4 The meeting of the CBS/MG-12 had considered the relationship between the work of the OPAG on PWS, the “WMO Strategy for Service Delivery” and the GFCS. There was a strong recommendation for cross-Commission contact to be established to coordinate work on Service Delivery and the GFCS. At CBS/MG-12, the President of CBS also made the proposal that the OPAG on PWS be re-named the “OPAG on Service Delivery”, and that the ICT would need to consider this proposal. The Chairperson also briefed the ICT on work concerning costs and benefits of different elements of the “Weather Service Production Chain” which was being carried out by the MG.

4.5 In relation to the “WMO RA VI Conference on Social and Economic Benefits (SEB) of Weather, Climate and Water Services”, the Chairperson provided a succinct overview of some of the main themes discussed at the Conference. Among those active within the OPAG who presented papers or were otherwise active at the Conference were Mr Ivan Čačić (Croatia, President of RA VI (Europe)), Mr Axel Thomalla (Deutscher Wetterdienst (DWD)) and the Chairperson himself. Benefit / cost ratios which had emerged from a range of SEB studies conducted in a variety of countries were generally in the range 5:1 to 10:1. However, there had also been a focus on how much the intrinsic value of a forecast could be downgraded by losses and inefficiencies in the delivery chain.

4.6 In reporting on the SG-SWFDP, the Chairperson noted that close to 50 Members were engaged with this Project at one level or another, and that this greatly challenged the capacity of the WMO Secretariat and the more developed Members to support the range of sub-projects in a meaningful way. There was a roadmap whereby sub-projects, once mature, would transition to operations with responsibility for oversight and resourcing transferring from the Secretariat to appropriate Regional groups. The primary challenge for the ICT was to identify resources within the broader PWS community which might contribute to the furtherance of the objectives of the SWFDP. The ICT noted that some of the ETs had contributed significantly to SWFDP activities and encouraged them to increase their engagement with the PWS work within the sub-projects. The ICT requested that the quarterly reports of the SWFDP sub-projects be circulated to the ICT members on a routine basis.

4.7 Looking forward, the Chairperson identified the principal thematic areas which the OPAG would need to consider and integrate into its Work Programme over the coming years. These included:

- **Service Delivery** – the challenge for the OPAG is to translate the concept into outcomes;
- **Societal and Economic Benefits of NMHSs** – the ICT should focus on the effective communication and use of results of various studies to optimize the benefits to NMHSs. As part of this work, the ICT should seek close collaboration with the SERA Working Group of WWRP;
- **Competencies and skills relevant to PWS** – this was a new requirement for the OPAG and would be considered under Agenda Item 12. Competencies had already been established and agreed within the Commission for Aeronautical Meteorology (CAeM) in respect of aviation forecasters; the OPAG had the task of developing a Competency Framework for PWS forecasters;
- **Communication** – this was a core area of expertise and concern for the OPAG; there was a clear need to focus on the optimum use of new media, and especially Social Media, in the context of NMHSs as many Members sought guidance on this topic; and
- **DRR** – the OPAG would consider a report on this topic from Mr Michel Jean, Coordinator for DRR with CBS, and would need to formulate a clear understanding of its responsibilities to CBS in respect of the work undertaken in this area.

4.8 The ICT considered the proposal from the President of CBS that the OPAG should change its name to become the “OPAG on Service Delivery”. There were pros and cons to this suggestion. Clearly the PWS Programme had taken a lead role within the WMO Secretariat in furthering the work on Service Delivery, and, in particular, in developing the Implementation Plan. However, the PWS “brand” had developed considerable strength within the WMO community over nearly two decades, and this brand strength was a significant asset. Service Delivery would need to be viewed as a cross-collaborative activity within the Organization; and there was a danger that, if the OPAG on PWS were to become the OPAG on Service Delivery, it might imply that other Commissions and Bodies within WMO were relieved of the responsibility to address Service Delivery. This would not help with promulgating and implementing the concept. Thus, the ICT decided to preserve the name of the OPAG as the OPAG on PWS.

4.9 The ICT agreed that the Chairperson should proactively make contact with the Chairpersons of appropriate bodies in other TCs, such as the Open Panel of CCI Experts (OPACE III) and OPACE IV in Commission for Climatology (CCI) and the corresponding Open Panel of CHY

Experts (OPACHEs) in Commission for Hydrology (CHy). This decision would be reflected in the ICT Deliverables for the coming period.

4.10 In considering the point raised by one Member at Congress regarding the appropriate relationship / distinction between public weather services and commercial weather services, the OPAG felt that this raised many policy issues and was not something to be determined at the TC level. The OPAG should, within the context of Service Delivery, concentrate on improving the delivery of both *Public Goods* and *Tailored Goods*. Decisions as to whether a service should be provided within a PWS or a commercial framework were related to compensation policies and would necessarily differ from one country to another.

4.11 In considering the question of Social Media and its use within the context of NMHSs, the ICT identified resourcing as a key question which would inform the degree to which organizations could use this technology. There was a *tour de table* to review the various policies implemented in respect of Social Media within the NMHSs represented at the ICT. Points which emerged were:

- **United States of America (USA)** – A lot of use was made of Social Media in the USA. Local forecast offices have their own Facebook pages. The NWS is also prototyping / evaluating Twitter at several forecast offices. Mention was made of the “Hootsuite” software, a Social Media Dashboard, which was found to be a valuable tool to help manage social media networks;
- **Australia** – Considerable corporate overview / control of the presence of the Australian Bureau of Meteorology (BoM) on social media. Facebook is primarily about outreach. The Bureau does not have a Twitter service, but does have its own YouTube channel. Operational material is reserved for the official website;
- **Canada** – The requirement to make all government services available in two languages increases the resource implications for the MSC in providing material on social media. They are exploring ways to use these channels to help exploit an informal “network of networks” for observations. As well, prototyping is taking place to test the capability of Social Media (Twitter as one example) to alert and disseminate high impact weather warning;
- **China** – The national and provincial Meteorological Services have begun to disseminate weather forecasting and warning information through micro blogs. Shanghai meteorological micro blog has been identified as one of the governmental official blogs interacting with the public and it has become an important method complementing the official dissemination of weather forecasting and warning; and,
- **Ireland** – No active presence on Facebook. Twitter account is active and is used to communicate forecasts and warnings as an adjunct to the operational channels of dissemination.

4.12 In further discussion, the ICT recognized that the strengths of Social Media, as used at present, lay primarily in building interactive relationships with users. These new media mediums were well suited to being an informal channel of communication, providing background information and context to the forecasts and warnings issued through the primary means of dissemination.

4.13 The ICT also discussed the World Weather Information Service (WWIS) and Severe Weather Information Centre (SWIC) services, and was informed during the holding of the meeting that the total number of hits on the WWIS Website had just exceeded 1 billion since the inception of the service. In relation to the content on the WWIS Website, the ICT recommended that Members examine the possibility of providing forecasts to the website which matched, in reach and in update frequency, the forecasts presented on their own websites.

5. REVIEW OF THE CURRENT TERMS OF REFERENCE (TORS) OF THE ICT

5.1 The Terms of Reference (TORs) of the ICT/PWS, as approved by CBS, are as follows:

- a. Coordinate and keep under review the work of the PWS Expert Teams;
- b. Ensure coordination of the work of the OPAG with that of other WMO Programmes which relate to PWS;
- c. Continue to consult and collaborate, as required, with other technical commissions and with other CBS OPAGs to ensure coordination of services and systems;
- d. Continue to encourage stronger dialogue between NMHSs and the private sector – in particular the media – in areas relevant to PWS;
- e. Continue to provide guidance to Members on the importance of NMHSs as the sole authority in the provision of official severe weather warnings;
- f. Review and report on the effectiveness on the information and guidance material produced by the PWS Programme among NMHSs and relevant media and user groups;
- g. Review and report on the improvements in national and regional PWS activities as a result of demonstration projects and other WMO initiatives (following the “Learning-Through-Doing” Project concept) contributed to by the PWS Programme;
- h. Review and report on the effectiveness of PWS training activities;
- i. Develop and maintain a database of PWS Experts who are willing to provide contributions to training activities and workshops;
- j. Assist NMHSs in the identification and assessment of the societal and economic benefits of Public Weather Services and promotion of the benefits to be gained by users;
- k. Explore mechanisms to strengthen dialogue between WMO and the International Olympics Committee (IOC) in the context of meteorological support for the Olympic Games; and,
- l. Continue to promote awareness in the PWS community of all relevant material arising from the work of the Expert Teams.

5.2 The ICT reviewed the TORs and progress on the associated Deliverables where relevant. It agreed on new TORs for the forthcoming intersessional period as outlined under Item 13 below.

6. REVIEW OF THE DELIVERABLES FROM THE 2010 MEETING OF THE ICT (SHANGHAI, CHINA)

The ICT reviewed the existing Deliverables as agreed at the Shanghai meeting in 2010 and was brought up-to-date on the progress in each case. This list, with the progress noted, is provided as Annex IV to this Report.

7. REPORT OF THE CHAIRPERSON OF THE ET/SPI

7.1 The CBS/OPAG-PWS Expert Team on Services and Products Improvement (ET/SPI), had not met since the last ICT/PWS meeting, held in September 2010. As such, the Chairperson of ET/SPI provided a status update on the ET/SPI deliverables identified during its last meeting in May 2010. To date, two of the ten deliverables have been completed, with various levels of progress on the eight others. The status of the deliverables are summarized below.

7.2 The ET/SPI Deliverable 1 was to develop an inventory of probabilistic training material for forecasters to deliver and communicate uncertainty and probabilistic weather products to the public / media and to request the sharing of such material. The Team collected probabilistic forecast training material from eight NHMSs. The Team also documented a collection of relevant training materials from academia and university-government consortia. This information will be placed on a resource page currently under development on the WMO PWS Website. These materials will be used to develop training materials to complement WMO/TD-No. 1422, "Guidelines on Communicating Forecast Uncertainty" (Deliverable 2).

7.3 The ET/SPI's Deliverable 3 was to develop a pilot project, following the PWS "Learning-Through-Doing (LTD)" Project concept, to improve the service delivery process. The Team chose to leverage the SWFDP – Eastern Africa sub-project as the LTD Pilot Project for this deliverable. Deliverable 6 was to contribute to the PWS verification and evaluation aspects of SWFDP – also involves interaction with SWFDP.

7.4 While the ET/SPI has not yet engaged the SWFDP Eastern Africa directly since its May 2010 meeting, the PWS Programme has been fully engaged with the SWFDP since its inception. The Chairperson of the ET/SPI served on the SWFDP Steering Group from 2008-2010. The Chairperson of the OPAG on PWS/ICT participated in the Steering Group's most recent meeting held at WMO Headquarters, Geneva, Switzerland, from 28 February to 2 March 2012. During this meeting, the SG-SWFDP reviewed the progress of the SWFDP pilots and noted that SWFDP – Eastern Africa is still in the early stages of implementation. Accordingly, the ET/SPI will coordinate its engagement with the SWFDP East Africa sub-project regarding Deliverables 3 and 6 with the ICT.

7.5 The ET/SPI has made only minor progress on Deliverable 4, which was to collaborate with the CBS/OPAG-PWS ET/COPE to develop a supplement to WMO/TD-No.1422 to describe best practices for user-oriented forecast products. The Team identified and discussed a study from Sweden about how to use ensemble predictions for operational flood forecasting undertaken under the auspices of the European Union (EU) Project PREVIEW. The study indicates that effective training and communication are clearly necessary to overcome the substantial institutional and communicative challenges in the application of Ensemble Prediction System (EPS). The Team still needs to pursue collaboration with ET/COPE to complete this deliverable.

7.6 The ET/SPI has completed Deliverable 5, which was to provide guidance for NMHSs on developing user surveys and interpreting their results, through providing a collection of existing tried-and-tested surveys. The Team collected examples of user surveys from nine NHMSs. The WMO Secretariat sent a circular letter, along with samples of questions from all the surveys and the summary guide, to the Permanent Representatives, PWS experts and Focal Points identified by NMHSs. The surveys have been posted on the WMO PWS Website, which can be located at the following link: <http://www.wmo.int/pages/prog/amp/pwsp/surveys.htm>.

7.7 The ET/SPI continues to look for opportunities to enhance the WWIS Website. Deliverable 7, which is to develop and provide WWIS standard verification reports, looks to build on work done by DWD for Region VI to implement a verification scheme for WWIS temperature forecasts. Limited progress has been made on this Deliverable. The ET/SPI will follow up with DWD to further explore the possibility of applying their multi-country verification system to WWIS as part of its work plan for the upcoming ET/SPI meeting in August 2012.

7.8 The completion of Deliverable 8, which directs the implementation of the verification scheme for temperature forecasts in all nine language versions of WWIS through the designated WWIS Coordinators, is pending action on Deliverable 7.

7.9 The ET/SPI identified the need to develop and maintain a list of subject matter experts in five skill areas within PWS as Deliverable 9. The Team identified the following skill areas: verification; quality management; application of probabilistic forecasting for PWS; service delivery; and emerging technology / application. To date, this Deliverable remains incomplete. The Team plans to address this action as part of its upcoming meeting in August 2012.

7.10 The ET/SPI's last deliverable, Deliverable 10, focuses on the implementation of the "WMO Strategy for Service Delivery". Shortly following the ET/SPI meeting in May 2010, the WMO Secretariat informed the Team that the draft "WMO Strategy on Service Delivery" was being revised based on discussions during the Sixty-second Session of the WMO Executive Council (EC-LXII, Geneva, Switzerland, June 2010). The Strategy was developed by the WMO Secretariat and approved by Cg-XVI in 2011. The associated Implementation Plan is currently under development.

7.11 The Team identified two additional actions in association with Deliverable 10: publish guidelines for using Quality Management Systems (QMS) to improve service delivery; and provide examples of service delivery metrics used in NMHSs, along with suggestions on how to develop them. In 2011, the Team developed a draft guideline to address these issues. Some of the critical material from the draft was incorporated into the "WMO Strategy for Service Delivery". The ET/SPI will review the draft guideline at its upcoming meeting in August 2012 to determine what, if any, remaining information needs to be provided to the PWS community, and the best method to accomplish it (guideline, etc.).

8. REPORT OF THE CHAIRPERSON OF THE ET/DPM

8.1 The most recent meeting of the CBS/OPAG-PWS Expert Team on PWS in Support of Disaster Prevention and Mitigation (ET/DPM) was held in Beijing, China, from 17 to 21 October 2011, and was enhanced by the participation of a number of disaster management experts. The Meeting first reviewed the Deliverables which were agreed to at the 2009 Kuala Lumpur meeting, and was pleased to note that nearly all of the Deliverables had been completed.

8.2 In close accord with WMO's Strategic Thrust towards Service Delivery, it was suggested by PWS/ICT that the existing ET/DPM should refocus on user needs and share responsibility for monitoring and evaluation with the other PWS ETs. To address this requirement, the Meeting considered the existing TORs and discussed the merits of retaining, modifying, or omitting each of these. Several additional TORs were developed and included. Agreement was also reached on the most appropriate title for the new ET in consideration of both WMO guidance and the new draft set of TORs. The draft title chosen was "PWS Expert Team on Meeting User Needs in Reducing the Impacts of Hydrometeorological Hazards".

8.3 Dominating the business of the Beijing meeting was the subject of "Memoranda of Understanding" (MoUs) between NMHSs and DMAs. The value, content and structure of MoUs were considered in some detail. As an outcome, one of the key Deliverables of the ET would be a MoU template for fostering collaboration and partnerships between NMHSs and DMAs. Specific SOPs (Standard Operational Procedures) could be appended to individual MoUs as required. ET Members have also contributed examples of existing MoUs between NMHSs and DMAs for inclusion in the documentation. The MoU outline drafted during the Beijing meeting has already been expanded to a complete set of Guidelines that is now with ET Members for comment with the addition of the following Appendices:

- a. Considerations during development and revision of MoUs; and,
- b. Best Practice for developing strong partnerships with DMAs.

8.4 Another key Deliverable of the Beijing meeting would be the provision of guidance material to NMHSs on developing impact-based information, forecast and warning services on various time scales for hydrometeorological hazards. This initiative is in recognition of a growing demand on NMHSs to provide impact-based services or hydrometeorological information and products supporting impact-based services provided by other organizations, where appropriate. The Meeting agreed to provide a common definition of impact-based information, forecast and warning services to ET Members for comment. Also requested would be examples from ET Members of existing impact-based information, forecast and warning services. The examples gathered from ET Members would then be presented in an integrated format to the WMO Secretariat. Steady progress has been made on this Deliverable with a draft document being circulated among ET Members. For completeness, the provision of advice information in warning products is also discussed. Warnings, produced and delivered through a system comprising NMHSs and partner agencies, would ideally have three (3) key components:

1. Technical / hydrometeorological information;
2. Likely / potential impact; and,
3. Community advice (suggested course of action).

8.5 A Deliverable of the 2009 ET/DPM meeting was an inventory of expertise needed for capacity-building in PWS aspects of DPM. The ET finalized this "List of Areas of Expertise needed for Capacity-Building in PWS Aspects of Disaster Prevention and Mitigation", which characterizes expertise in five (5) main subject areas. Expanding on that work, a list of experts in those fields who are willing to contribute to PWS training and development activities will be developed and maintained. NMHSs would also be assisted with the definition and development of work force competencies needed to effectively interact with the user community, especially DMAs. The progress on this Deliverable has been in close alignment with the agreed timelines.

8.6 ET Members also agreed to engage other WMO Constituent Bodies to explore common areas of interest and possible collaboration. Separate Focal Points among the ET Members have been identified and will contact the relevant WMO Programmes, such as the Tropical Cyclone Programme (TCP) and DRR, to exchange information on common and relevant Programme activities including production of guidance and other documentation. Other Focal Points within the ET are tasked with making contact with the other PWS ETs and CBS OPAGs to similarly exchange information and establish agreed areas of common interest for collaboration. This is essentially an ongoing objective with engagement expected to largely occur on an opportunistic basis.

8.7 When the Deliverables are complete towards the end of 2012, the WMO Secretariat will forward them to NMHSs with a cover note and request comment and feedback on their usefulness.

9. REPORT OF THE CHAIRPERSON OF THE ET/COPE

9.1 The Chairperson of the CBS/OPAG-PWS ET/COPE provided a review of the Team's activities and accomplishments since the last meeting of the ICT, focusing particularly on the outcomes of the Expert Team's meeting in Mombasa, Kenya in December 2011. The work of the Team and future plans are summarized below.

9.2 The Expert Team had reviewed its TORs in view of the decision by CBS-Ext.(10), to restructure the PWS OPAG to align itself with the “WMO Strategy for Service Delivery”. Accordingly, the TORs were adjusted to more clearly emphasize service delivery aspects, whilst still retaining the Team’s thematic focus of expertise. Opportunities were also taken to streamline the TORs, and blend those that had a common focus or scope. In association with these changes to the TORs, the Team reviewed its name and proposes to change it to the “Expert Team on Communication, Outreach and Public Education Aspects of Public Weather Services Delivery”.

9.3 The Meeting was advised that at the Mombasa meeting, the Expert Team reviewed the deliverables which had been agreed to at its previous meeting (Havana, Cuba, November 2009). Unfinished items were carried over to a new set of deliverables, and new activities that aligned with the new TORs were added, resulting in the following deliverables:

- Completion of the “Guidelines on Communicating the Socio-Economic Benefits of Public Weather Services (PWS)”;
- Completion of “Guidelines on the Use of Social Media by National Meteorological and Hydrological Services (NMHSs)”;
- Developing a list of experts to assist with training and development activities on communication, outreach and public education aspects of PWS delivery;
- Preparation of Summary Guides on: (i) using social media by NMHSs; (ii) communicating socio-economic benefits of PWS; and, (iii) conducting PWS outreach activities;
- Preparation of the “Guidelines to Assist National Meteorological and Hydrological Services (NMHSs) to Develop a Corporate External Communication Strategy”;
- Developing a template for a Memorandum of Understanding (MoU) between an NMHS and a media organization;
- Determining opportunities for collaboration on communication, outreach and public education aspects of: (i) the WMO Integrated Global Observing System (WIGOS) (through the Inter-Commission Coordination Group (ICG) on WIGOS); and, (ii) climate services (through the Commission for Climatology (CCI) and the Global Framework for Climate Services (GFCS) Office);
- Liaising with other PWS ETs, CBS OPAGs, Technical Commissions (TCs) and Regional Associations (RAs) to identify opportunities for collaboration and sharing of information on areas of mutual interest;
- Developing an on-line survey for NMHSs, to be completed by their PWS Focal Points (FPs), that measures the usage of different media for PWS delivery; and,
- Seeking opportunities to organize training courses for senior and executive NMHS managers on working with media, e.g., in association with study tours, meetings of senior and executive managers, RA Sessions, etc.

9.4 The ICT noted that the MoU templates developed by the ET/DPM and the ET/COPE were very similar in nature and agreed that, for simplicity, these should be merged into single template for a MoU between a National Meteorological Service and a partner agency. This would be supplemented by examples of a MoU with a DMA, and a media organization.

10. REPORT OF THE COORDINATOR OF THE DISASTER RISK REDUCTION (DRR) INTER-COMMISSION TASK TEAM ON SUPPORT TO HUMANITARIAN ORGANIZATIONS

10.1 The “Inter-Commission Task Team (ICTT) on Meteorological Services for Improved Humanitarian Planning and Response” was established by CBS at its Fourteenth Session (Dubrovnik, Croatia, March - April 2009). The objective of the ICTT is to work towards the development of operational capacities to provide meteorological, hydrological and climate information products and services to humanitarian agencies at international, regional and national levels to support their emergency contingency planning, preparedness and response.

10.2 The TORs for the Task Team are as follows:

- I. To review the structure and decision-making processes of the humanitarian agencies at global, regional and national levels;
- II. To review the meteorological hydrological and climate information products and services currently used by humanitarian agencies, including their sources and dissemination mechanisms;
- III. To review needs and requirements of humanitarian agencies for meteorological, hydrological and climate information products and services;
- IV. To review the capacities available through the WMO operational network for provision of meteorological, hydrological and climate information products and services;
- V. To identify major gaps with respect to the utilization of meteorological, hydrological and climate information products and services; and,
- VI. To recommend concrete actions leading to the initiation of pilot projects for the development of prototype products and services targeted at the needs and requirements of the humanitarian agencies.

10.3 The first meeting of the Task Team did not explicitly examine the research aspects associated with the existing and future needs of humanitarian agencies. The initial priority was to take advantage of existing research and prototypes that are currently running, but not in an operational mode. The second stage will be for research to help the Task Team address the gaps and continuously improve the systems. For this to work, participants agreed that research aspects needed to be represented in the future work of the ICTT.

10.4 Two contractors are in the process of finalizing the characterization of meteorological and hydrological information products at global and regional levels. In parallel to this, a high-level identification of key requirements of humanitarian organizations will be done and a concrete action plan will be developed and presented. The tasks should be complete by end of 2012, and the report of the ICTT is expected to be issued at that stage.

11. SUMMARY REVIEW REPORT ON THE WORLD EXPO 2010 NOWCASTING SERVICES (WENS) DEMONSTRATION PROJECT

11.1 At the Shanghai World EXPO 2010, the WENS Demonstration Project, under the guidance of its Scientific Steering Group (SSG), demonstrated how nowcasting applications could enhance short-range forecasts of severe weather. The initiation of the WENS brought about a transformation at the SMS, both in terms of technological advancement and in the attitude of the personnel. The technical nowcasting systems incorporated into WENS included Australia BoM's STEPS, CMA's SWAN, BMB's BJANC, SMS's NoCAWS, STI's STI-WARR, and HKO's SWIRLS.

11.2 To provide technical support to the participant systems, the SMS developed an integrated data analysis platform for the Yangtze River Delta area with a monitoring system which displayed four colour-coded warning categories to alert forecasters on duty. Impact-based forecasts were developed, which focused on the impacts of developing weather on specific people, locations, and / or events. The impact categories were divided into three types: natural environment; urban infrastructure; and events / groups.

11.3 An integrated PWS operations system was established at the SMS, anchored by a Chief Service Officer (CSO) with a new set of SOPs developed to strengthen partnerships between the SMS and other agencies and special users. A standardized nowcasting SOP was also established with a "Fast Track" mechanism between the forecast centre and the service platform, leading to an improvement in the response time for special user groups. SOPs for multi-agency response were implemented as one of the key functions of the Multi-Hazard Early Warning Systems (MHEWS).

11.4 At the site of the Shanghai World EXPO 2010, weather service personnel stationed at EXPO Command Headquarters continually monitored weather conditions and were on hand to provide actionable suggestions for performances and other activities. 15% of outdoor activities were adjusted or cancelled by EXPO Site Management, based on suggestions and recommendations from the EXPO Weather Service. Response actions, such as the closing of elevated pedestrian walkways and the interruption of electric bus services, or river ferries, were carried out according to pre-determined plans established before EXPO.

11.5 Assessments of nowcasting by forecasters and the end-users were conducted. A comparison of the results showed an active change in forecasters' attitude to the nowcasting operations. The outcome of the end-users' assessment proved some interesting results; they showed that: 1.) content and timeliness have a greater impact on satisfaction than accuracy; 2.) the general public appreciate receiving information in the most convenient way possible; 3.) the nowcasting service increased users' level of satisfaction with the weather service; and, 4.) a public user's preference for a certain type of weather has a direct impact (either positive or negative) on their level of satisfaction of a forecast's accuracy.

11.6 Further extension to the work carried out under the WENS Demonstration Project has been recommended as follows:

- 11.6.1 Nowcasting operations should be a standard part of NMHSs' everyday operations, and efforts to promote nowcasting should be developed and strengthened between CBS and Commission for Atmospheric Sciences (CAS) within the work programmes of PWS Programme, WWRP, THORPEX, and SWPDF.
- 11.6.2 Guidance should be developed on impact-based forecasts, enabled by nowcasting techniques, to help identify the definitions, approaches, and procedures and to assist NMHSs in providing better service to end-users.
- 11.6.3 A manual on how to conduct benefit and risk assessments should be developed to guide the assessments as part of everyday PWS operations. It is important to improve the impact-based warning standards and to identify key indicators for special user groups in order to create a risk matrix, allowing them to build their own impact response capabilities.
- 11.6.4 Guidance in the development of SOPs for PWS delivery should be established, associated with the appropriate CSO or Weather Preparedness Meteorologist (WPM) competencies, for more effective service delivery. A weather information explanation mechanism should be part of daily SOPs to raise users' awareness of weather impacts.

- 11.6.5 It would be desirable to extend the current MHEWS into a multi-scale system to improve the end-to-end Service Delivery, guided by QMS, with a focus on food safety, health, environment and disaster reduction. Risk analysis, archiving, and assessment strategies should, as a basic work plan, be conducted not just to support the end-to-end-to-end of MHEWS approach, but the GFCS adaptation as well. Further collaboration in capacity-building and training should continue, to assist and promote both internal cross-collaborative WMO Programmes and external partnering development agencies such as the World Bank.
- 11.6.6 Newly developed approaches to urban service delivery strategies, incorporating the current efforts of “good practice” and also pilot projects like WMO GAW Urban Research Meteorology and Environment (GURME), should be continued. Joint efforts with CCI and international organizations (such as the World Health Organization (WHO)) should also be strengthened in the fields of health, environment and meteorology.

12. DISCUSSIONS ON DEFINITIONS OF EXPERTISE / COMPETENCIES REQUIRED FOR PWS, INCLUDING THE REPORT OF THE EXECUTIVE COUNCIL (EC) PANEL OF EXPERTS ON EDUCATION AND TRAINING (ETR)

12.1 The ICT considered PWS lists of expertise / competencies, and the background information provided on competencies in other fields of meteorology, with a view of agreeing on how to compile a list of expertise required of the personnel of NMHSs who are engaged in PWS activities. The ICT agreed that the list of competency areas, once compiled, would be presented to CBS-XV for its formal approval.

12.2 The ICT reviewed the material developed under the auspices of CAeM in relation to competencies for Aeronautical Meteorological Forecasters. It also had access to the Competencies developed by BoM for Tropical Cyclone Forecasters and some material from Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) on the competencies relevant to Operational Marine Forecasters.

12.3 The ICT recognized that the application of competencies for Aeronautical Forecasters would take place within a regulatory framework and that there would be an element of compulsion on personnel to satisfy assessment under this Framework. However the “Competency Framework for PWS Forecasters” would not be implemented in such a regulatory environment so the Competencies to be developed would act primarily as Guidance for NMHSs.

12.4 The ICT reviewed some definitions of the term “competency” and discussed the distinction between competencies and skills. There was some discussion about underlying behavioural competencies, such as “Communications” and “Team Working” but a recognition was reached that the “Competency Framework for a PWS Forecasters” needed to be focused more on specific tasks and skills, following the overall definition of competency as the “Ability to do a job properly”.

12.5 The MSC noted that they identified five (5) core competencies for forecast staff, which were:

- a. Communications;
- b. Adaptability;
- c. Working with Others;
- d. Client Focus; and,

e. Thinking

12.6 The ICT had the benefit of a wide-ranging discussion by teleconference with Mr Jeff Wilson, Director of Education and Training Office of WMO. This discussion explored the question of whether the competencies needed to follow a template similar to that developed for Aeronautical Meteorology, and agreed that this was not absolutely necessary, but highly desirable. There was also discussion around the matter of assessments, as the competencies needed to be structured in a way that facilitated, where possible, the clear application of an assessment procedure. There was some discussion around the concept of incorporating an element of user-based assessment but it was recognized that this would pose practical difficulties. Mr Wilson advised against using the term "Meteorologist" within the competency framework and definitions as some NMHSs had Forecasters who did not possess formal Meteorological qualifications.

12.7 Mr Wilson further informed that ICT that Dr Francois Lalaurette, Director of the Ecole Nationale de la Météorologie in Toulouse, France, had been identified as the Point of Contact between the EC Panel of Experts on Education and Training and CBS.

12.8 In discussion, the ICT agreed that a set of core competencies ought to be developed which related to the work of the "bench" forecaster. These should be generic enough to be applicable in all forecast offices around the world, with each Meteorological Service then adapting and expanding them to suit their own needs and circumstances. A set of additional competencies ought to be developed which related to different specialisations, including the engagement of forecasters with emergency management work, with media work, and with the development of new products and services. It was recognized that the introduction of a "Competency Assessment" scheme within an NMHS implied the dedication of a significant time resource to enable such a scheme to be successfully applied.

12.9 The ICT decided that it should produce one set of competencies for PWS Forecasters with the intention of presenting this competency framework to CBS at the forthcoming Session in September. The Chairperson of the ICT would take primary responsibility for preparing a draft of this competency framework, which would be circulated to the Members of the ICT and to colleagues specializing in forecasting within the Secretariat (Data-Processing and Forecasting System (DPFS) Division) and at the CBS level. It was recognized that ET/SPI, at their planned meeting in August, would need to review this competency framework with respect to their own areas of specialization before the draft could be finalised for presentation to CBS.

13. DISCUSSION AND FINALISATION OF THE ICT TORS AND DELIVERABLES

The TORs for the ICT for the period 2012-2014, which will be proposed to the forthcoming Session of CBS, were agreed upon and are presented in Annex III to this report. The corresponding Deliverables were also agreed upon and these are outlined in supporting Annex V.

14. PREPARATION FOR THE CBS-XV SESSION

14.1 The ICT reviewed the items which would need to be brought to the attention of the forthcoming CBS Session for information and / or decision. It was noted that this Session would be very short, comprising five (5) working days with an additional two half-days for the TECO. Documents to be presented to the Session should be concise and should be focused on decisions requested. It was presumed that there would also be scope for Background Documents (as with CBS-Ext.(10) in Namibia in 2010) where progress on the various initiatives being conducted within the OPAG could be outlined.

14.2 The ICT agreed that the following matters needed to be brought to the attention of the CBS Session:

- 14.2.1 New TORs and Deliverables for the ICT – to be presented and agreed;
- 14.2.2 New TORs for the Expert Teams within the PWS OPAG – to be presented for information;
- 14.2.3 Re-ordering / naming of ET structures within the OPAG – to be proposed for agreement;
- 14.2.4 Presentation of the draft Service Delivery Implementation Plan for consideration by the Commission (possibly in conjunction with the TECO);
- 14.2.5 Contacts with other Commissions in the context of Service Delivery – to be proposed and noted by the Commission;
- 14.2.6 Presentation of the “Competency Framework for PWS Forecasters” – to be proposed for agreement;
- 14.2.7 DRR-related matters – possible recommendations from the ICTT to be proposed for agreement;
- 14.2.8 Social and Economic Benefits – proposed project and activities (RA VI, World Bank, etc.); and,
- 14.2.9 Exhortation to appoint Focal Points / use the FP Network as a resource.

15. VISIT TO ENVIRONMENT CANADA FACILITIES IN THE MONTREAL REGION

15.1 The ICT paid a visit to the Prediction and Training Section, Weather and Environmental Operations, Quebec Region, of the MSC. This comprises two sections; one focused on PWS forecast services and one on Aviation forecast services. The latter office has responsibility for all aviation forecast services in the eastern section of Canada; an office in Edmonton takes responsibility for the western section of the country. The offices are arranged so that they can back each other up, to ensure resiliency. Of particular interest was an internet-based tool, developed within MSC, which allowed individual clients to pose questions to the forecaster via a messaging system; the questions and responses were then visible to all users who were logged-in. This tool freed up the forecaster from answering repetitive telephone calls. In the PWS section of the forecast office the ICT viewed the Ninjo visualisation system used by a consortium of NMHSs, (Canada, Denmark, Germany and Switzerland,). The Team were provided with an overview of the systems which facilitated the work of the office and the range of services provided.

15.2 The ICT also had the opportunity to visit the “Biosphere”; a significant resource in Public Education and Outreach developed and maintained by Environment Canada. This comprises a building complex within the shell of a geodesic dome, which was originally constructed as the U.S. Pavilion for the Montreal Expo in 1967. Conceived by the visionary architect, inventor and environmentalist, Buckminster Fuller, this building is now used as the site for a variety of permanent and touring exhibitions on the themes of environment and sustainability. The “Biosphere”, located in a park on an island within the St. Lawrence Seaway, is equipped with excellent meeting facilities and the ICT was pleased to pursue one of its meeting days there, during which the members took some time to enjoy a tour of the facility.

16. PREPARATION, REVIEW AND ADOPTION OF THE REPORT OF THE MEETING AND THE EXECUTIVE SUMMARY

The ICT reviewed a draft of the Final Report of the meeting and approved the overall structure and content, which would be fleshed out and completed over the forthcoming weeks.

17. CLOSING

17.1 The Chairperson and Members of the ICT expressed the gratitude of the Team to Mr Michel Jean and all the staff of the MSC for the time and effort they had put into the excellent hosting of the meeting. Special thanks were expressed to Ms Jennifer Milton and Ms Jacinthe Lacroix, for the dedication and warm friendship they had displayed in facilitating the meeting, the visits and the associated activities during the week.

17.2 The meeting closed at 1530 hours on Friday, 27 April 2012.

**MEETING OF THE COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA
GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION
TEAM ON PWS (CBS/OPAG-PWS ICT/PWS, MONTREAL, CANADA, 23-27 APRIL 2012)**

LIST OF ANNEXES TO THE FINAL REPORT

- Annex I:** List of Participants
- Annex II:** Meeting Programme
- Annex III:** Draft Terms of Reference (TORs) of the ICT/PWS (2012-2014)
- Annex IV:** ICT/PWS Team Deliverables and Action Sheets for the period 2010/2012
- Annex V:** ICT/PWS Team Deliverables and Action Sheets for the intersessional period 2012/2014
- Annex VI:** CBS Operating Plan – PWS Section (Excel Spreadsheet)
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**MEETING OF THE COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA
GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION
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LIST OF PARTICIPANTS

NO.:	COUNTRY:	NAME AND TITLE:	ADDRESS:
1.	Ireland	<i>Mr Gerald FLEMING Chairperson of the CBS/OPAG- PWS ICT/PWS and Head of Forecasting Office at Met Éireann</i>	Met Éireann (The Irish Met. Service) Glasnevin Hill DUBLIN, Ireland Tel.: +353 1 8064 208 Fax: +353 1 8064 275 E-mail(s): gflaming@eircom.net gerald.fleming@met.ie
2.	Australia	<i>Mr James Thomas DAVIDSON Member of the CBS/OPAG-PWS ICT/PWS, Chairperson of the CBS/OPAG-PWS ET/DPM and Regional Director (Queensland) for the Australian Bureau of Meteorology</i>	Australian Bureau of Meteorology GPO Box 413 BRISBANE, Australia 4001 Tel.: +61 7 3239 8739 Fax: +61 7 3239 8688 E-mail: j.davidson@bom.gov.au
3.	Australia	<i>Mr Jonathan GILL Member of the CBS/OPAG-PWS ICT/PWS and Chairperson of the CBS/OPAG-PWS ET/COPE</i>	c/o Australian Bureau of Meteorology 700 Collins Street Docklands, MELBOURNE 3001, Australia Tel.: +61 3 9669 4219 Fax: +61 3 9669 4473 E-mail: j.gill@bom.gov.au
4.	Canada	<i>Mrs Jennifer Ann MILTON Director, National Prediction Program, Weather and Environment Prediction and Services Directorate, Former Forecaster, Climate</i>	Environment Canada 2121 TransCanada Hwy, 1 st Floor DORVAL (QUEBEC), Canada H9P 1J3 Tel.: +1 514 421 4610 Fax: +1 514 421 7250 E-mail: jennifer.milton@ec.gc.ca
5.	Canada	<i>Mr Michel JEAN Member of the CBS/OPAG-PWS ICT/PWS, Chairperson of the Inter-Commission Task Team Task Team on Meteorological Services for improved Humanitarian Planning and Response and Director General, Weather and Environmental Operations, Meteorological Service of Canada, Environment Canada</i>	Weather and Environmental Operations Meteorological Services of Canada Environment Canada 2121 TransCanada Highway DORVAL, QUÉBEC H9P 1J3, Canada Tel.: +1 514 421 4601 Fax: +1 514 421 4600 E-mail: Michel.Jean@ec.gc.ca

6.	Canada	Ms Jacinthe LACROIX Executive Manager, Weather and Environmental Operations Meteorological Services of Canada, Environment Canada	Weather and Environmental Operations Meteorological Services of Canada Environment Canada 2121 TransCanada Highway DORVAL, QUEBEC H9P 1J3, Canada Tel.: +1 514 421 4603 Fax: +1 514 421 7250 E-mail: Jacinthe.Lacroix@ec.gc.ca
7.	China	Dr TANG Xu Member of the CBS/OPAG-PWS ICT/PWS and Director General of the Shanghai Meteorological Service (SMS), China Meteorological Administration (CMA)	Shanghai Meteorological Service 166 Puxi Road SHANGHAI, China 200030 Tel.: +86 21 5489 6598 Fax: +86 21 6487 5023 E-mail: tangxu570512@vip.sina.com
8.	United States of America	Mr John L. GUINEY Member of the CBS/OPAG-PWS ICT/PWS, Chairperson of the CBS OPAG/PWS ET/SPI and Chief, Meteorological Services Division, National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), Eastern Region Headquarters	NOAA/NWS Eastern Region Headquarters 630 Johnson Avenue, Suite 202 BOHEMIA, New York, 11716-2618 United States of America Tel.: +1 631 244 0121 Fax: +1 631 244 0167 E-mail: John.Guiney@noaa.gov
<p>WMO SECRETARIAT 7 bis, avenue de la Paix Case Postale No. 2300 CH-1211 GENEVA 2 Switzerland</p> <p>PWS Website</p> <p>http://www.wmo.int/pages/prog/amp/pwsp/eventsexpertmeetings_en.htm</p>			
9.	Switzerland	Ms Haleh KOOTVAL Chief, Public Weather Services Division	Public Weather Services Programme Weather and Disaster Risk Reduction Services Department (WDS) Tel.: +41 22 730 8333 Fax: +41 22 730 8128 E-mail: HKootval@wmo.int

**MEETING OF THE COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA
GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION
TEAM ON PWS (CBS/OPAG-PWS ICT/PWS, MONTREAL, CANADA, 23-27 APRIL 2012)**

MEETING PROGRAMME

Monday, 23 April 2012

DAY 1			
0900-0930	1. Opening 2. Organization of the meeting <ul style="list-style-type: none"> • Adoption of the agenda • Working arrangements 	<ul style="list-style-type: none"> • Host • Mr Gerald Fleming (Chairperson of the OPAG-PWS ICT) • Ms Haleh Kootval (WMO Secretariat) 	30 minutes
0930-1030	3. Review of relevant decisions of CBS-Ext.(10) and Sixteenth World Meteorological Congress (Cg-XVI), including Socio-Economic Benefits of Meteorological and Hydrological Services	<ul style="list-style-type: none"> • Mr Gerald Fleming • Ms Haleh Kootval 	60 minutes
1030-1100	COFFEE / TEA BREAK		30 minutes
1100-1200	4. Report of the OPAG Chairperson on Activities of the OPAG, including Relevant Decisions of the CBS-MG Meeting	<ul style="list-style-type: none"> • Mr Gerald Fleming 	60 minutes
1200-1330	LUNCH BREAK		90 minutes
1330-1430	5. Review of the current Terms of Reference (TORs) of the ICT	<ul style="list-style-type: none"> • Mr Gerald Fleming • Ms Haleh Kootval 	60 minutes
1430-1530	6. Review of the Deliverables from the 2010 Meeting of the ICT (Shanghai, China)	<ul style="list-style-type: none"> • Mr Gerald Fleming • Ms Haleh Kootval 	60 minutes
1530-1600	COFFEE / TEA BREAK		30 minutes
1600-1700	7. Report of the Chairperson of the ET/SPI	<ul style="list-style-type: none"> • Mr John Guiney 	60 minutes
<i>Tuesday, 24 April 2012</i>			
DAY 2			
0900-0930	7. Discussions of the Report of the Chairperson of the ET/SPI	<ul style="list-style-type: none"> • All participants 	30 minutes

0930-1030	8. Report of the Chairperson of the ET/DPM	• Mr Jim Davidson	60 minutes
1030-1100	COFFEE / TEA BREAK		30 minutes
1100-1130	8. Discussions of the Report of the Chairperson of the ET/DPM	• All participants	30 minutes
1130-1230	9. Report of the Chairperson of the ET/COPE	• Mr Jon Gill	60 minutes
1230-1400	LUNCH BREAK		90 minutes
1400-1430	9. Discussions of the Report of the Chairperson of the ET/COPE	• All participants	30 minutes
1430-1530	10. Report of the Coordinator of the DRR Task Team on Support to Humanitarian Organizations	• Mr Michel Jean	60 minutes
1530-1600	COFFEE / TEA BREAK		30 minutes
1600-1700	10. Discussions on the Report of the Coordinator	• All participants	60 minutes
Wednesday, 25 April 2012			
DAY 3			
0900-1000	11. Summary Review Report on the World EXPO 2010 Nowcasting Services (WENS) Demonstration Project	• Dr Tang-Xu	60 minutes
1030-1100	COFFEE / TEA BREAK		30 minutes
1100-1130	11. Discussions on the Report of WENS	• All participants	30 minutes
1130-1230	12. Discussions on definitions of Expertise / Competencies Required for PWS, including the report of the EC Panel of Experts on ETR	• Mr Jon Gill • Mr Jim Davison • Mr John Guiney • Ms Haleh Kootval	60 minutes
1230-1400	LUNCH BREAK		90 minutes
1400-1530	12. Discussions on definitions of Expertise / Competencies Required for PWS, including the report of the EC Panel of Experts on ETR (continued)	• All participants	90 minutes
1530-1600	COFFEE / TEA BREAK		30 minutes

1600-1700	13. Discussion on the ICT TORs and the Need to Identify Clear and Corresponding Deliverables	<ul style="list-style-type: none"> All participants 	60 minutes
Thursday, 26 April 2012			
	DAY 4		
0900-1000	14. Finalization of the ICT TORs and Deliverables	<ul style="list-style-type: none"> All participants 	60 minutes
1000-1030	15. Preparation for the CBS-XV Session	<ul style="list-style-type: none"> All participants 	30 minutes
1030-1100	COFFEE / TEA BREAK		30 minutes
1100-1200	15. Preparation for the CBS-XV Session (continued)	<ul style="list-style-type: none"> All participants 	60 minutes
1200-1330	LUNCH BREAK		90 minutes
1330-1700	16. Visit to the National Meteorological Centre, Montreal	<ul style="list-style-type: none"> All participants 	210 minutes
Friday, 27 April 2010			
	DAY 5		
0900-1030	17. Preparation of the report of the meeting and the Executive Summary	<ul style="list-style-type: none"> All participants 	90 minutes
1030-1100	COFFEE / TEA BREAK		30 minutes
1100-1230	17. Preparation of the report of the meeting and the Executive Summary (continued)	<ul style="list-style-type: none"> All participants 	90 minutes
1230-1400	LUNCH BREAK		90 minutes
1400-1530	18. Review and Adoption of the report	<ul style="list-style-type: none"> All participants 	90 minutes
1530-1600	COFFEE / TEA BREAK		30 minutes
1600-1700	18. Review and Adoption of the report (continued)	<ul style="list-style-type: none"> All participants Chairperson 	60 minutes
1700	CLOSURE OF THE MEETING		

**MEETING OF THE COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA
GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION
TEAM ON PWS (CBS/OPAG-PWS ICT/PWS, MONTREAL, CANADA, 23-27 APRIL 2012)**

**DRAFT TERMS OF REFERENCE (TORS) OF THE ICT/PWS
(2012-2014)**

1. The following draft Terms of Reference (TORs) were agreed by the ICT/PWS for presentation to CBS-XV for consideration:
 - a. Coordinate the implementation of Congress, Executive Council and the Commission for Basic Systems (CBS) decisions with respect to Public Weather Services, especially those relating to the “WMO Strategy on Service Delivery”;
 - b. Keep under review the work of the PWS Expert Teams and coordinate and guide their work programmes;
 - c. Consult and collaborate to ensure coordination of the work of the Open Programme Area Group (OPAG) with that of other CBS OPAGs, Technical Commissions (TCs), EC Working Groups, Regional Associations (RAs) and WMO Programmes and initiatives;
 - d. Continue to encourage stronger dialogue between National Meteorological and Hydrological Services (NMHSs) and development partners and users (e.g., media, health, emergency management) in areas relevant to PWS;
 - e. Continue to encourage and provide guidance to Members to assert the authority of NMHSs as the sole providers of official high-impact weather warnings;
 - f. Evaluate and report on the effectiveness of the information and guidance material produced by the PWS Programme, and the demonstration projects and other WMO initiatives to which the Programme contributes, in building the capacity of NMHSs;
 - g. Develop and keep under review a competency framework appropriate to PWS forecasting and related activities;
 - h. Collaborate with development partners and other WMO entities to assist NMHSs in the identification and assessment of societal, economic and environmental impacts and benefits of hydrometeorological services;
 - i. Provide guidance to NMHSs in the provision of enhanced hydrometeorological support for major cultural and sporting events; and,
 - j. Continue to promote awareness in the WMO community of material arising from the work of the OPAG.

COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION TEAM (CBS/OPAG-PWS ICT/PWS)

ICT/PWS TEAM DELIVERABLES AND ACTION SHEETS FOR THE PERIOD OF 2010/2012

<i>Deliverable 1: Conduct a joint seminar with the International Association of Broadcast Meteorologists (IABM) on the optimum use of new media for the effective communication of weather information.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Organize and conduct a seminar. Publish results and outcomes.	Chairperson / OPAG	Prior to CBS 2012; TBD	Not done.
2.	Gerald Fleming to raise this at the IABM meeting in October; research options for location, timing, meeting support, etc.	Chairperson / OPAG		Done. No suitable date or opportunity was identified.
<i>Deliverable 2: Prepare a synthesis document on the various components of the PWS Programme activities related to the Shanghai 2010 World EXPO with a distillation of lessons learned for future reference.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Synthesis document to be prepared following the discussions at the ICT-2010 meeting.	WENS Coordinators and the WMO Secretariat	November 2010	Final Report of WENS project published in February 2012
2.	Lessons learnt from WENS.	WENS Coordinators	2011	Workshop was organized for four (4) countries in Shanghai in November 2011. Other actions proposed in the report of the Final Review Meeting.
<i>Deliverable 3: Strengthen the involvement of the NMHS PWS Focal Points with the work of the OPAG and the PWS Programme.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:

1.	Update the list of PWS National Focal Points periodically.	WMO Secretariat	Ongoing	To date, 86 Members have nominated FPs.
2.	Request Permanent Representatives (PRs) to appoint FPs in Member countries where none are as yet identified.	WMO Secretariat	Ongoing	Letters of reminder have been sent out
3.	Carry out a regular survey of PWS NFPs and publish results.	WMO Secretariat	Ongoing	Being done.
4.	Keep PWS NFPs fully involved and informed in the activities of the PWS Programme and the OPAG.	WMO Secretariat	Ongoing	Quarterly reports on activities of PWS Programme are sent to PWS NFPs and feedback is requested.
<i>Deliverable 4: Detailed feedback from recipients of targetted PWS activities, such as SWFDP, Learning-Through-Doing (LTD) Projects, training, etc.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Organize the collection and analysis of feedback from training participants and PRs.	WMO Secretariat	Ongoing	This is done following training workshops. Some responses collected but not all participants respond.
2.	Collate information flowing back from the feedback mechanisms built into the SWFDP, and publish on PWS Website.	Co-Chairperson / OPAG; Secretariat	Ongoing	Feedback is collated from SWFDP quarterly reports. The full sets of feedback reports to date will be published on the PWS Website by end-March 2012.
3.	Organize the reception of bi-annual reports from Members participating in LTD Projects (through PWS NFPs, where possible) and publish on PWS Website.	WMO Secretariat	Ongoing	This is being done.

<i>Deliverable 5: List of PWS experts who can contribute to training, etc.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Develop and refine the existing drafts of PWS Expertise and Competencies relevant to the work areas of the various Expert Teams.	ET Chairpersons	ET/DPM, ET/COPE (end-October 2010) and ET/SPI (end-year 2010)	Work completed by ET/DPM and ET/COPE. To be done by ET/SPI.
2.	Collate and harmonize the three (3) lists of PWS Expertise and Competencies areas into one over-arching list, adding in any other PWS Expertise areas that are identified in feedback from training courses, etc.	WMO Secretariat	End-February 2011	The full set of competency / expertise areas will be developed into a document in consultation with the ETR Office and will be presented to CBS for for approval.
3.	Based on the list developed in 2 above, write to PRs and ask them to nominate Experts who would be available and willing to participate in PWS work.	WMO Secretariat	April 2011	To be done.
4.	Develop a list of Experts with appropriate expertise and competencies as defined through the processes above.			In 2012-2014 Deliverables.
<i>Deliverable 6: Collate existing studies and research in the area of socio-economic applications of weather, water and climate services. Publish Guidance on the operational use of economic assessment techniques.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Carry out a literature review of existing relevant studies and prepare a synthesis document which summarises the published knowledge.	Option A – Hire a consultant (Talk to Prof. John Zillman). Option B – work with SERA / WWRP Group (Mr Brian Mills) WMO Secretariat	TBD	This work is being done by the PWS Programme and the Regional Office for Europe (ROE) as a joint WMO-World Bank Project. (see Annex IV)

2.	Publish Guidance document based on the above work.	WMO Secretariat / Chairperson/OPAG	CBS-XV 2012	Joint WMO-WB guidance material will be published upon completion of the work as indicated in Annex IV.
Deliverable 7: Guidelines for Meteorological support to Olympic Games.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Review draft and scope the remaining work.	Mr Michel Jean	Completed	
2.	Update and complete the existing draft document.	Mr Michel Jean	End-2010	Contractors expected to finalize draft in mid-2012.
3.	Publish the completed document on the PWS webpages and provide print copies to the IOC and other sporting organizations, NMHSs and other relevant bodies.	WMO Secretariat	April 2011	In 2012-2014 Deliverables.
Deliverable 8: Market and promote availability and use of PWS material among NMHS / PWS community.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Prepare an electronic "brochure" with links to the various PWS Websites and circulate to the PRs and PWS NFPs.	WMO Secretariat	April 2011	Clarified that this refers to more general promotion of PWS material through electronic means. Transferred to 2012- 2014 Deliverables.
2.	Encourage the PWS NFPs to promote and spread knowledge about the "How-To" guides within their own NMHSs.	WMO Secretariat	Ongoing	Being done in quarterly letters to PWS NFPs.
3.	Investigate availability of statistics of hits on and usage of PWS pages on WMO Website.	WMO Secretariat	End-2010	Statistics provided to meeting of ICT/PWS in April 2012.

4.	<p>Discuss, with WMO Webmaster, strategies for increasing the ease of access to PWS pages through Google and other search engines.</p> <p>Action Column:</p> <p><i>Action taken: Tips, as provided by WMO Webmaster, for easy search by Google include:</i></p> <ul style="list-style-type: none"> -Keeping the site regularly updated; -Purchasing an additional and parallel domain name for example <i>www.wmopws.org</i> to automatically point to <i>wmo.int/pws</i>; -using downloadable content on the site; -Keeping the site as clean as possible with html and coding; -Creating a site map and linking to it from every page; -Using backlinks. (Links pointing to your website from another website e.g. external partners websites); -joining forums as a great way to achieve links to your website; -Outbound links: On every page place one outbound link to a high ranking site; and, -Using ezine ads (or newsletters). Creating an ezine is probably the most beneficial step to take, to increasing web presence. 	WMO Secretariat	End-2010	Done: Please see the 'Action' column
5.	Make available WMO-No. 834 in soft copy on the PWS pages of the WMO Website.	WMO Secretariat	End-2010	Done April 2012.
Deliverable 9: Promote the concept of NMHSs as the Single Official Voice at times of severe weather.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Investigate the use of World Met Day and any other relevant occasions to promote this concept.	Chairperson/OPAG and WMO Secretariat	February 2010	No specific progress to report.
2.	Make use of the new "WMO Register of Alerting Authorities" to promote and embed the SOV concept.	Chairperson/OPAG and WMO Secretariat	Ongoing	Letters to PRs inviting them to nominate editors of the Register contained this.
3.	Ensure inclusion of this principle in all relevant PWS documents.	WMO Secretariat	Ongoing	Being done.

4.	Use the potential partnership with Google to highlight this in all future relevant WMO documentation.	Chairperson/OPAG and WMO Secretariat	Ongoing	This subject is not active at the moment but will be kept in view.
<i>Deliverable 10: Facilitate the development of one or a number of "one-stop-shops" for the provision of meteorological advice and assistance to the Humanitarian Response Community.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Prepare an inventory of data and products that are currently available and can be used by Humanitarian Agencies.	Chairperson/ICTT and WMO Secretariat	October 2010	Will be encompassed by the Final Report of the ICTT which is expected later in 2012.
2.	Compile a listing of PWS-based resources relevant to point 1 above and communicate this to Secretariat DPFS, to include basic warnings, basic public forecasts, SWIC, WWIS, etc.	WMO Secretariat	End-2010	Awaiting Final Report as mentioned under Point 1.
3.	Investigate the use of the delivery structure of WMO (Regional Specialized Meteorological Centres (RSMCs), Regional Climate Centres (RCCs), etc.) and the network of (national) PWS Focal Points as a resource in the context of national operations of Humanitarian Agencies.	Chairperson/ICTT and WMO Secretariat	TBD	PWS NFPs are being trained to interact with the disaster management and civil protection organizations. Transferred to 2012-2014 Deliverables.
<i>Deliverable 11: Investigate the opportunities to develop and assist with improving media and communication skills for PRs and other senior NMHS Managers.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Investigate with Development and Regional Activities (DRA) Department and Communications and Public Affairs (CPA) Office the possibilities of using RA meetings to deliver training courses aimed at senior NMHS personnel.	WMO Secretariat	February 2010	Difficult to identify suitable opportunities given the busy schedules of senior NMHS Execs.

2.	Explore options with IABM for resourcing the training of communications in this context.	Chairperson/OPAG and WMO Secretariat	October 2010	See note above.
<i>Delivery 12: Delivery of the report of the ICT.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Finalize report of the ICT meeting in September 2010; circulate to all members and publish on the PWS Website.	Chairperson/OPAG and WMO Secretariat	End-October 2010	Finalized

COMMISSION FOR BASIC SYSTEMS OPEN PROGRAMME AREA GROUP ON PUBLIC WEATHER SERVICES (PWS) IMPLEMENTATION / COORDINATION TEAM (CBS/OPAG-PWS ICT/PWS)

ICT/PWS TEAM DELIVERABLES AND ACTION SHEETS FOR THE INTERSESSIONAL PERIOD 2012/2014

<i>Deliverable 1 (TOR a): When the draft Service Delivery Implementation Plan is complete, study the Plan and ensure that the consequential actions relevant to PWS are carried out.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Circulate the draft of the Service Delivery IP to the ICT Members.	WMO Secretariat	When ready	
2.	ICT Members to review the draft and provide feedback.	All ICT Members	Within one month	
3.	Present the reviewed draft to CBS.	WMO Secretariat	September 2012	
<i>Deliverable 2 (TOR c): Establish contact with relevant people in other CBS OPAGs, Commissions, etc., as required.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Contact Chairpersons of OPACE III/IV to explore possible collaboration.	Chairperson	June 2012	
2.	Contact representatives of CHy to explore possible collaboration.	Chairperson	June 2012	
<i>Deliverable 3 (TORs c and d): Facilitate the development of one or a number of "one-stop-shops" for the provision of advice and assistance to the Humanitarian Response Community.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Finalize the Report of the ICTT and circulate as required.	Chairperson/ICTT	End-2012	
2.	Prepare an inventory of data and products that are currently available and can be used by Humanitarian Response agencies.	Chairperson/ICTT and WMO Secretariat	End-2012	
3.	Compile a listing of PWS-based resources relevant to point 1 above and communicate this to Secretariat DPFS, to include basic warnings, basic public forecasts, SWIC, WWIS, etc.	WMO Secretariat	End-2012	

4.	Investigate the use of the delivery structure of WMO (RSMCs, RCCs, etc.) and the network of National Focal Points as a resource in the context of national operations of Humanitarian Response agencies.	Chairperson/ICTT and WMO Secretariat	End-2012	
Deliverable 4 (TOR e): Promote the concept of NMHSs as the Single Official Voice at times of severe / high-impact weather.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Make use of the new "WMO Register of Alerting Authorities" to promote and embed the SOV concept.	Chairperson/OPAG and WMO Secretariat	Ongoing	
2.	Designate an Expert Advisor to assist with the implementation of CAP at NMHSs and to promote registration of Members in the "WMO Register of Alerting Authorities".	ICT Members / WMO Secretariat	May 2012	Identify and contact an expert advisor.
3.	Ensure inclusion of this principle in all relevant PWS documents.	WMO Secretariat	Ongoing	
Deliverable 5 (TOR f): Detailed feedback from recipients of targetted PWS activities, such as SWFDP, Learning-Through-Doing (LTD) Projects, training, etc.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Organize the collection and analysis of feedback from training participants and PRs.	WMO Secretariat	Ongoing	
2.	Collate information flowing back from the feedback mechanisms built into the SWFDP and publish on the PWS Website.	Co-Chairperson/OPAG and WMO Secretariat	Ongoing	
3.	Organize the reception of bi-annual reports from Members participating in LTD Projects (through Focal Points where possible) and publish on the PWS Website.	WMO Secretariat	Ongoing	
Deliverable 6 (TOR g): Develop a Competency Framework for PWS Forecasting and Activities.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Draft a Competency Framework relevant to PWS Forecasters and circulate to all ICT Members, ETR Representatives, etc.	Chairperson	May 2012	
2.	Review draft and provide feedback to WMO Secretariat / Chairperson	All ICT Members	July 2012	

3.	Finalize PWS Competency Framework for CBS-XV	WMO Secretariat / Chairperson	August 2012	
Deliverable 7 (TOR h): Develop materials on the Social and Economic Benefits of NMHSs as decided by the RA VI (Europe) Task Team and the World Bank Project.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Compile and carry out comparative analysis of the impact of the services provided by NMHSs through socio-economic benefits studies.	RA VI TT on socio-economic benefits / World Bank	Mid- to end-2012	
2.	Improve methodologies in SEB studies through concurrent field testing and training as part of specific demonstration / pilot projects as well as on-going NMHSs' investment programmes.	World Bank / WMO Secretariat	End-2012 through 2013	
3.	Disseminate through an authoritative joint WMO-World Bank guidance document	WMO Secretariat / World Bank	Dependent on 2 above	
4.	Contribute to CBS-TECO on benefit-cost studies insofar as possible	All ICT Members	September 2012	
Deliverable 8 (TOR i): Future activities as a follow-up to WENS.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Finalize "Concept Note" developed in Shanghai in November 2011 regarding the follow-up activities to WENS.	Dr Tang Xu	End-2012	
2.	Implement follow-up activities as defined in the "Concept Note".	Persons as defined in the "Concept Note"	Mid-2013	
3.	Prepare publications, etc., as outlined in Section 12 of the WENS Final Report.	Shanghai Meteorological Service (SMS)	End-2012	
Deliverable 9 (TOR i): Guidelines for Meteorological Support to Olympic Games.				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Review current draft and bring it up-to-date, include the Beijing and Vancouver Games, then provide to IOC and other sporting organizations as appropriate, and publish on PWS Webpage.	Chairperson ET/SPI / WMO Secretariat	September 2012	

<i>Deliverable 10 (TOR j): Strengthen the involvement of the NMHSs' PWS Focal Points with the work of the OPAG and of the PWS Programme.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Update the list of National PWS Focal Points periodically.	WMO Secretariat	Ongoing	
2.	Request PRs to appoint National PWS Focal Points in Member countries where none are, as yet, identified.	WMO Secretariat	Ongoing	
3.	Carry out a regular survey of the work of the National PWS Focal Points in relation to PWS functions and publish the results.	WMO Secretariat	Ongoing	
4.	Keep National PWS Focal Points fully involved and informed in the activities of the PWS Programme and of the OPAG.	WMO Secretariat	Ongoing	
<i>Deliverable 11 (TOR j): Market and promote the availability and use of PWS material among the NMHS / PWS Community.</i>				
	Action(s):	Responsible Member(s):	Due Date:	Status:
1.	Periodically review statistics on the hits and usage of PWS pages on the WMO Website.	WMO Secretariat	Ongoing	
2.	Continue to implement strategies for increasing the ease of access to PWS pages through Google and other search engines.	WMO Secretariat	Ongoing	

CBS Operating Plan – PWS Section

No.	Activities	Deliverables	Progr.	ER(s)	KO	KPI	KPT 2015	Cost by year [in K CHF]				Total Costs	Source of Funding
								2012	2013	2014	2015		
1	Establish an Expert Team on Service Delivery with particular focus on implementation of the WMO Strategy for Service Delivery	Publish Guidance on the means to improve Service Delivery by NMHSs; develop strategies to optimize the implementation of this Guidance	PWS	1	1.1	1.1		60	60	60	60	360	In-kind (expert resources)
2	Complete the WENS project through reviewing progress made and sharing the results	Hold a series of training workshops to identify best practice flowing from the WENS project and to apply this elsewhere	PWS	1	1.1	1.1		24	24	24	24	96	In-kind (expert resources)
3	Improve the communications and networking capabilities of top-level NMHS managers	Workshops and training courses aimed at senior NMHS personnel	PWS	1	1.1	1.1		42	42	42	42	168	In-kind (expert resources)
4	Strengthen NMHS engagement with user communities through Learning-Through-Doing projects and in particular through the SWFDP	Engagement with SWFDP; development with stand-alone PWS Learning Through Doing projects (in conjunction with Regional Associations)	PWS	1	1.1	1.1		48	48	48	48	192	In-kind (expert resources)
5	Strengthen the cooperation with the Climate community, in particular through contributing to the development of a Global Framework for Climate Services	Joint meetings and workshops organized with CCI other members of the Climate community. Extension of Guidance, especially in the areas of presentation, communication and user engagement, to the climate time-scales	PWS	1	1.1	1.1		51	51	51	51	204	In-kind (expert resources)

6	Build the knowledge on quantifiable assessment, and deepen appreciation of the social and economic impact of meteorological services	Promote studies and research in the area of socio-economic applications of weather, water and climate services. Publish Guidance on the operational use of economic assessment techniques	PWS	1, 7	1.1	1.1		42	42	42	42	168	In-kind (expert resources)
7	Examine how new and emerging means of using communications technology, including social media, might be best utilized for the delivery of meteorological services	Conduct workshops and develop Guidance material on the optimum exploitation of new and emerging uses of Information and Communications Technologies	PWS	1	1.1	1.1		30	30	30	30	120	In-kind (expert resources)
8	Consider the technological challenges and roadblocks in delivering weather information to users seamlessly	Provide advice and guidance on optimum formats and compatibilities (GIS etc) for the integration of weather information with widely-used decision support systems.	PWS	1	1.1	1.1		18	18	18	18	72	In-kind (expert resources)
9	Continuing to build the Public Education function of NMHSs, especially in regard to impacts of severe weather	Provision of guidance material on recommended advice to be issued in conjunction with Severe Weather Warnings. Workshops and training activities	PWS	1	1.1	1.1		42	42	42	42	168	In-kind (expert resources)
10	Work with the Humanitarian Response community to develop a better understanding of their particular needs, and develop products and services to meet those needs	Facilitate the development of one or a number of "one-stop-shops" for the provision of meteorological advice and assistance to the Humanitarian Response community	DRR	2	2.1	2.1		42	42	42	42	168	In-kind (expert resources)

11	Develop methodologies for the proper assessment and documentation of meteorological hazards	Make studies of, and develop prototype guidelines for monitoring, archiving, mapping and statistical analysis methodologies for a selection of meteorological hazards	DRR	2	2.1	2.1		42	42	42	42	168	In-kind (expert resources)
								393	393	393	393	1,884	