

**PUBLIC WEATHER SERVICES, INCLUDING THE REPORT BY THE  
CHAIR OF THE OPEN PROGRAMME AREA GROUP – ER 7**

**SUMMARY**

**ISSUES TO BE DISCUSSED:**

1. Services and Products Improvement for PWS
2. Communication Aspects of PWS
3. PWS in Support of Disaster Prevention and Mitigation
4. International Exchange of Public Weather Forecasts and Warnings
5. Social and Economic Applications of PWS
6. PWS Demonstration Projects
7. Public Education and Outreach
8. Capacity Building and Training
9. Members' priorities
10. Future directions

**ADDITIONAL FINANCIAL IMPLICATION:**

None

**DECISIONS/ACTIONS REQUIRED:**

Adoption of the draft text for inclusion in the general summary of CBS-XIV.

**REFERENCES:**

1. *Abridged Final Report with Resolutions and Recommendations of the Commission for Basic Systems Extraordinary Session, Seoul, Republic of Korea, 9–16 November 2006* (WMO-No. 1017)
2. *Abridged Final Report with Resolutions of the Fifteenth World Meteorological Congress* (WMO-No. 1026)
3. *Abridged Final Report with Resolutions of the Sixtieth Session of the Executive Council* (WMO-No. 1032)

**CONTENT OF DOCUMENT:**

**Appendix for inclusion in the final report:**

Draft text for inclusion in the general summary of CBS-XIV

**Related document for information:**

**CBS-XIV/INF. 8:** Progress/Activity Report

## **DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF CBS-XIV**

### **8. PUBLIC WEATHER SERVICES (PWS), INCLUDING THE REPORT BY THE CHAIR OF THE OPEN PROGRAMME AREA GROUP – ER 7 (*agenda item 8*)**

**8.1** The Commission considered and appreciated the report of the chairperson of the OPAG on PWS, Mr Gerald Fleming (Ireland). It recalled that the work of the OPAG was coordinated through three expert teams and an Implementation Coordination Team (ICT) and commended the respective team members for delivering on their mandate. The Commission expressed satisfaction with the continued evolution of the PWS Programme (PWSP) and the new innovative initiatives it was implementing in accordance with the decisions of Congress and CBS.

**8.2** The Commission reiterated the role of public weather services as a critical element of NMHSs, to deliver and communicate high quality, useful, relevant and timely, weather and related information and services on a daily basis so as to enable users to make informed and timely decisions. In this regard, the Commission welcomed the adoption by Cg-XV (May 2007) of the definition of core elements of a national public weather services programme and urged its members to make every effort to ensure that these elements were put in place.

#### **Services and Products Improvement for PWS**

**8.3** As regards the RA II Pilot Project on the Provision of City-Specific Numerical Weather Prediction (NWP) Products to Developing Countries via the Internet, the Commission welcomed the steady progress made in its implementation. City-specific forecast time series products, provided by Hong Kong, China; Japan and Republic of Korea, have been launched on their respective websites since January 2006. By the end of December 2008, 18 RA II Members had joined the project. Forecasts time series for a total of 160 cities were being provided to 13 participating Members. The Commission urged Members from developing countries of RA II who had not done so, to participate in the project.

**8.4** The Commission considered the results of the Survey on Improving the Delivery of Public Weather Services compiled by the PWS Expert Team on Services and Products Improvement (ET/SPI) and made available on the PWS Website. The survey results showed that NMHSs considered capacity building as the most important issue in attaining high quality service delivery and that there was need for continuous training of staff at higher levels of specialization in all the areas related to PWS. Other priorities concerned new and innovative methods to ensure cost-effective transfer of knowledge to staff of NMHSs and end-users; and improvement of nowcasting capabilities for more accurate and timely warnings of severe weather. The Commission requested the PWS Programme and the OPAG on PWS to consider these priority areas in shaping the future work of the OPAG.

#### **Communication Aspects of PWS**

**8.5** The Commission welcomed the development of a set of examples of 'best practices' (WMO/TD-No. 1409 (PWS-17)) by the Expert Team on Communication Aspects of PWS (ET/COM) on how to effectively communicate weather information, across a range of services delivery methods and information types. Examples include graphical presentations, use of icons and other weather symbols, as well as effective verbal communication on radio. Noting that the publication had been distributed and was available on the WMO Website, the Commission encouraged NMHSs to make maximum use of the publication.

**8.6** Following the participation of the Secretariat in the Third RANET-Africa Leadership Team (RALT) Meeting (Arusha, Tanzania 2008), the Commission noted the progress made in the implementation of the RANET project in Africa and in the Pacific region. It requested the ET/COM

to collaborate closely with the national and international implementers of RANET so that the project could benefit from the expertise of the ET/COM.

**8.7** The Commission recognized the continuing work within the OPAG on PWS on the use and interpretation of probabilistic forecast information. It particularly welcomed the publication of the “Guidelines on the Communication of Forecast Uncertainty” (PWS-18 - WMO/TD-No. 1422) which had been produced by the ET/COM assisted by a group of experts from the OPAGs on DPFS and PWS in 2007. The Commission requested the PWS Programme to ensure wide access to and use of this publication by NMHSs.

### **PWS in Support of Disaster Prevention and Mitigation**

**8.8** The Commission recalled its request to the OPAG on PWS to assist NMHSs to improve their nowcasting capabilities. It welcomed the organizing of a Workshop on Warnings of Real-Time Hazards (Sydney, Australia, 2006), and the subsequent establishment of the Joint Nowcasting Applications and Services (JONAS) Steering Committee in April 2007 to guide the advance of nowcasting in NMHSs. JONAS brought together experts from the Commission for Atmospheric Sciences (CAS) and the OPAG on Public Weather Services as an excellent example of cross-Commission working teams. The Commission requested that JONAS continue to be engaged in the application of nowcasting to public weather services.

### **International Exchange of Public Weather Forecasts and Warnings**

**8.9** The Commission commended the WMO Website ‘World Weather Information Service (WWIS)’ (<http://worldweather.wmo.int/>), for winning the Stockholm Challenge Award - Environmental Category in 2008. The Website, which is in Arabic, Chinese, English, French, Portuguese and Spanish languages, is coordinated by Hong Kong, China. The Commission noted the continuing upward trend in the use of the WWIS and the Severe Weather Information Services (SWIC) Websites which had been initiated through the work of the OPAG on PWS, thanked the host countries for their continued provision of technical and logistical support, and urged Members to promote the use of the information, as well as increase their contribution of information to these Websites.

**8.10** The Commission welcomed the strong and mutually supportive links that had developed between the SWIC Website and the MeteoAlarm project, an initiative of EUMETNET. The Commission urged both communities to continue to work closely together to promote international exchange of warnings of severe and high impact weather.

### **Social and Economic Applications of PWS**

**8.11** The Commission highlighted the emphasis which Resolution 16 of Cg-XV had put on the social and economic benefits which communities could gain through the development of appropriate public weather services, and followed Cg-XV in urging Members to quantify these benefits so as to demonstrate them clearly and to secure due support from governments for NMHSs.

**8.12** The Commission welcomed the establishment by the Secretary-General of a ‘Task Force on Social and Economic Applications of Meteorology and Hydrology’ (subsequently renamed as “WMO Forum: Social and Economic Applications and Benefits of Weather, Climate, and Water Services”). The purpose of the Forum is to improve interactions between providers and users of weather, climate and water services, and to contribute to the implementation of the Madrid Action Plan, which was a product of the Madrid Conference (Madrid, 2007). The Forum membership covers a wide spectrum including NMHSs, government departments, NGOs, the World Bank, academia and the media. Recognizing that public weather services played a key role in service delivery, the Commission requested the OPAG on PWS to coordinate its work with that of the

Forum in addressing the socio-economic applications of PWS, especially in preparation for the Madrid + 5 Conference.

**8.13** The Commission recognized that for assessing, quantifying and demonstrating benefits of weather, climate and water services to user sectors such as health, energy, tourism, transport and urban environment, many NMHSs would require assistance and guidance. In this regard, it urged its members to make optimum use of the decision-support tools provided at: <http://www.wmo.int/pages/prog/amp/pwsp/socioeconomictools.htm>. The Commission further requested the Secretary-General that WMO training workshops on the assessment of socio-economic benefits of meteorological and hydrological services similar to that held in Sofia, Bulgaria in 2008 be organized on a regional basis.

**8.14** The Commission welcomed the continued collaboration and participation by the PWSP in the work of the THORPEX Social and Economic Research and Application (SERA) Working Group. It noted that the Chair of the Working Group is a member of the WMO Forum, and that the interests of the PWSP continue to be represented through the participation of the Chair of the OPAG on PWS in the SERA Working Group. The Commission requested the OPAG on PWS to continue collaborating with SERA to address issues of mutual interest for the benefit of both communities.

### **PWS Demonstration Projects**

**8.15** Recalling the strategic decision of the OPAG on PWS to put emphasis on the implementation of expert advice and guidance, as discussed at CBS-Ext.(06), the Commission noted that action following its decision had resulted in the "Learning through Doing" concept developed by the ICT on PWS at its meeting in Muscat, Oman in 2007. The Learning through Doing concept involves building capacity of NMHSs using a coordinated training and mentoring programme. It is implemented with the aim of developing new and/or improved range of products and services to benefit targeted social and economic sectors identified by the countries themselves. The Commission was pleased to learn that projects following this concept had already commenced in Region III (Chile and Peru). In RA I, the project has started in Madagascar and resulted in the formation of a Working Group on Weather, Climate and Health. It requested the Secretariat to implement more LTD projects as a mechanism to initiate dialogue between users and providers and to build collaborative partnerships between the two communities.

**8.16** The Commission appreciated the strong engagement of the OPAG with the World Expo Nowcasting Services (WENS) Demonstration Project which had been initiated by WMO and the Shanghai Meteorological Bureau of the China Meteorological Administration, and which will run from 2008 to 2011. It approved the objectives of the WENS Demonstration Project, which were: to demonstrate how nowcasting applications can enhance multi-hazard early warning services, using the opportunity of the Shanghai 2010 World EXPO; and to promote the understanding and enhance the capability, as appropriate, of WMO Members in Nowcasting Services.

**8.17** The Commission reviewed the WENS Project Implementation Plan, and approved the structure whereby the Demonstration Project would be overseen by the WENS Science Steering Group, while the work "on the ground" would be coordinated by the WENS Working Group, who would establish working teams to deal with different aspects of the project. The Commission approved the Terms of Reference and Membership of both the WENS-SSG and the WENS-WG.

**8.18** The Commission observed that the Severe Weather Forecast Demonstration Project (SWFDP), an initiative of the OPAG on DPFS, had grown in scope to encompass the enhanced communication of forecast products and services to user groups. The Commission commended the cooperation between the OPAGs on DPFS and PWS in relation to this project, and requested that both OPAGs continue to work closely together in assisting Members to get the maximum benefit from advances in numerical weather prediction in providing timely forecasts and warnings of severe weather, and its potential impacts, to their users and to the public.

## **Public Education and Outreach**

**8.19** The Commission recalled its recommendation that the Expert Group on Public Education and Outreach should prepare strategies and guidelines on these important topics, and was pleased to learn that the Strategy for Developing Public Education and Outreach (WMO/TD-No. 1354/PWS-14) were produced and were made available on the WMO Website. It requested the OPAG on PWS to ensure that this topic is kept in view and to encourage the application of the guidance contained in the stated publication.

## **Capacity Building**

**8.20** In anticipation of increased demands from Members for capacity building, the Commission reiterated its call to PWSP to continue its efforts in capacity building despite funding constraints, especially as regards developing countries and LDCs. It encouraged the developed countries to provide assistance in improving service delivery in LDCs and developing countries. The Commission welcomed the WMO VCP Training Course on the Use and Interpretation of City-specific Numerical Weather Prediction Products (for Members participating in RA II City-Specific NWP Products Pilot Project) held in Hong Kong, China in December 2008, and thanked Hong Kong, China for hosting and financing the training course.

## **Collaborative activities with other CBS OPAGs**

**8.21** The Commission was pleased that the collaboration between the OPAG on PWS and the OPAG on DPFS within the Severe Weather Forecasting Demonstration Project had continued and had been strengthened. The OPAG on PWS had added substantial value to the project as reported during the Operational Phase Regional Training Workshop on the Use of GDPFS Products and Public Weather Services Aspects (Pretoria, South Africa, November 2008). It urged similar collaboration between the OPAG on PWS and other CBS OPAGs.

## **International Symposium on PWS**

**8.22** The report of the International Symposium on Public Weather Services, held in WMO in Geneva in 2007 was considered by the Commission. It endorsed the recommendations of the Symposium and urged the OPAG on PWS and the PWSP to follow the recommendations of the Symposium, with particular attention being placed on the following areas:

- (a) Provision of published Guidelines, training activities and workshops to support strengthening of PWS in NMHSs;
- (b) Assisting NMHSs to develop capacity in key areas of Service Delivery and to seek out and promulgate examples of best practice in the communication of NMHSs forecasts and warnings;
- (c) Supporting the "Learning through Doing" approach to training and to focus on participative learning projects which brought forecasters and users together;
- (d) Best ways of incorporating by NMHSs climate and water issues into routine service delivery and develop national PWS programmes into a one-stop-shop for weather, climate and water services;
- (e) The importance of familiarity by NMHSs with government long-term plans and the effective use of these plans to carry out gap analyses and shape new innovative services, as well to promote the training of senior NMHS managers so as to improve their skills in dealing with government officials, policy-makers and business leaders;

- (f) Assisting Members to address the UN Millennium Development Goals, the IPCC Nairobi Work Programme, and the Madrid Action Plan through modernized, integrated service delivery;
- (g) Reviewing and revising the structure of the OPAG on PWS in a manner that will best respond to the need to address social and economic aspects of public services.

### **Trends, developments and evolving needs**

**8.23** The Commission reiterated that NMHSs should keep abreast of achievements in the science of meteorology and related technologies in order to prepare for emerging trends, and to anticipate evolving needs of users. To respond to Members' needs, the Commission requested the PWSP to continue to pay particular attention to:

- (a) Delivery of services in a seamless and one-stop manner;
- (b) New forecasting products destined to the public, such as nowcasting products;
- (c) EPS based probabilistic forecasts and the assistance needed by developing countries in their use and exploitation; extended range and trend/change forecasts;
- (d) The use of the Internet and wireless delivery channels as a delivery mechanism for nowcasting products to the public on a real-time basis;
- (e) The need for a host of weather warnings and indices such as UV, heat waves and cold snaps that have emerged in response to the multi-faceted demands of various community groups.

### **Members' priority areas**

**8.24** The Commission requested the PWS Programme to focus on the following Members' priority areas:

- (a) *Service delivery* – Identifying users in various sectors and their needs and ensuring excellence in delivering services to them, continuous evaluation of user satisfaction, total quality management, and continuous improvement;
- (b) *Timely and Effective Communication of warnings* – Reaching and enabling the public to take action to safeguard life and property by using understandable language and terminology in NMHS products;
- (c) *Dissemination and presentation* – Equipping NMHS staff with media skills and presentation techniques to allow effective and timely dissemination and presentation of forecasts, warnings and information;
- (d) *Strengthening media relationships* – Effective collaboration and partnership with media to assist NMHSs to get official messages out in a timely manner, especially during severe weather;
- (e) *Public education and outreach* – To help the public be well-informed in weather and related issues so as to respond positively to the NMHS warnings and take appropriate action;
- (f) *Collaborative partnerships with users* – Building partnerships with all sectors and institutions requiring weather services that can also facilitate service delivery, is essential. This will ensure NMHSs' involvement with the disaster management and

media organizations in creating and testing effective disaster preparedness plans, warning systems, mitigation strategies and public education programmes;

- (g) *Contributing to enhancing the economic and social well-being* – NMHSs to partner with users for product design and service delivery in key sectors such as energy, health, transport and tourism to make a direct contribution to national socio-economic sustainable development.

### **Future directions**

**8.25** The Commission requested the PWS Programme to continue its focus on assisting Members to improve their national public weather services programmes through:

- (a) Providing guidance on the application of new technology and scientific research in:
- (i) Service delivery;
  - (ii) Data acquisition and use especially for nowcasting;
  - (iii) Probabilistic forecasts and information;
  - (iv) Multi-hazard warnings;
  - (v) New product design and communication;
- (b) Capacity building through training in all aspects of PWS;
- (c) Guidance on valuation of social and economic aspects of meteorological services;
- (d) Guidance and advice on user-based service assessment, and product verification;
- (e) Guidance on international and regional weather information exchange, including information on seasonal forecasts as appropriate.

**8.26** Taking into consideration the discussions held under the present agenda item, the Commission agreed to the future work plan of the PWS Programme as given under agenda item 12.2.

### **Terms of Reference**

**8.27** The Commission approved the Terms of Reference of the Implementation and Coordination Team on Public Weather Services (ICT-PWS) 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;
- (l) Continue to promote awareness in the PWS community of all relevant material arising from the work of the Expert Teams.

The Commission approved the Terms of Reference of the Expert Team on Services and Products Improvements (ET-SPI), within the OPAG on PWS, as follows:

- (a) Monitor and report on the progress of previous ET-SPI initiatives and make recommendations as appropriate to ICT-PWS;
- (b) Monitor and report on aspects of services and products improvements that relate to support of major WMO activities, including the Shanghai 2010 World EXPO Multi-Hazard Early Warning Systems project;
- (c) Provide guidance in the development of training materials on the applications of probabilistic forecasting products and services for multi-hazard early warning systems;
- (d) Report and advise on how to best assist developing countries with building an integrated approach to PWS products and services to improve service delivery;
- (e) Explore and advise on the further development of probabilistic and other non-deterministic forecast products and services;
- (f) Identify, report and provide recommendations on emerging needs for new and improved products and services with emphasis on key PWS user groups;
- (g) Continue to encourage the use of verification for PWS;
- (h) Keep under review the development of quality management procedures and practices relevant to PWS;
- (i) Develop and maintain a list of experts in Services and Products Improvements who are willing to contribute to PWS training activities;
- (j) Report and advise on collaborative activities with other CBS OPAGs and other WMO Technical Commissions;
- (k) Keep abreast of advances in, and promote as appropriate, the application of emerging technology to the delivery of public weather services, with particular emphasis on the

application of the database concept and the workstation and their implications for the changing role of the forecaster.

The Commission approved the Terms of Reference of the Expert Team on PWS in Support of Disaster Prevention and Mitigation (ET-DPM), within the OPAG on PWS, as follows:

- (a) Monitor and report on the progress of earlier initiatives of ET-DPM and make recommendations as appropriate to ICT-PWS;
- (b) Monitor and report on aspects of disaster prevention and mitigation that relate to support of major WMO activities, including the Shanghai 2010 World EXPO Multi-hazard Early Warning Systems project;
- (c) Identify ways to assist developing countries in their efforts to improve disaster prevention and mitigation in the context of their national PWS Programme;
- (d) Continue to provide guidelines on the development of the World Weather Information System (WWIS) and the Severe Weather Information Centre (SWIC) to promote improved international availability and access to NMHSs' official forecasts and severe weather information via the Internet;
- (e) Provide guidance on the role of PWS in the early warning process, including the development of appropriate reference material based on current practices in early warning, highlighting communication and technology aspects;
- (f) Keep under review the development of cross-border exchange of warnings with reference to the published WMO guidelines;
- (g) Develop reference material on the application of nowcasting to the provision of public warnings associated with mesoscale weather phenomena;
- (h) Develop and maintain a list of experts in PWS aspects of Disaster Prevention and Mitigation who are willing to contribute to PWS training activities;
- (i) Report and advise on the collaborative activities with other CBS OPAGs and technical commissions.

The Commission approved the Terms of Reference of the Expert Team on Communication, Outreach and Public Education Aspects of PWS (ET-COPE) (formerly Expert Team on Communications, ET-COM), within the OPAG on PWS, as follows:

- (a) Monitor and report on the progress of earlier initiatives of ET-COM and make recommendations as appropriate to ICT-PWS;
- (b) Monitor and report on communication, outreach and public education aspects of PWS that relate to support of major WMO activities, including the relevant Shanghai 2010 World EXPO demonstration project components;
- (c) Identify ways to meet the needs of developing countries in their efforts to improve their communication, outreach and public education relating to PWS products and services;
- (d) Examine, report and recommend on how best to continue the development of positive partnerships with national and international media organisations, and of assisting NMHSs to improve relations with the media;

- (e) Examine, report and recommend on the use of emerging new technologies for the communication of early warnings and other public weather services products and services;
- (f) Report and advise on ways of assisting NMHSs to enhance outreach and public education with a view to ensuring more effective use of PWS and enhancing the usefulness of new products and services;
- (g) Promote awareness of the impact of high-quality, well-communicated and well-delivered public weather services on the image and visibility of NMHSs;
- (h) Study and report on how best to educate end-users on the concepts of forecast uncertainty in a manner which enhances the usability of PWS products and services and strengthens the credibility of the service provider;
- (i) Examine how to ensure improved media attribution of the role of NMHSs in providing basic services and infrastructure which support weather presentations to the public;
- (j) Continue to advise on how NMHSs might more effectively educate, and communicate with, emergency managers, the media and the public on meteorological aspects of disasters;
- (k) Develop and maintain a list of experts in Communication, Outreach and Public Education who are willing to contribute to PWS training activities;
- (l) Report and advise on collaborative activities with other CBS OPAGs and with other WMO Technical Commissions.