

WORLD METEOROLOGICAL ORGANIZATION

PUBLIC WEATHER SERVICES

EXPERT TEAM ON WARNINGS AND FORECASTS EXCHANGE, UNDERSTANDING AND USE (WFEU)

PARIS, FRANCE

31 May - 4 June 2004



FINAL REPORT



EXECUTIVE SUMMARY

A meeting of the Public Weather Services (PWS) Expert Team on Warnings and Forecasts Exchange, Understanding and Use (ET/WFEU) was held in Paris, France from 31 May to 4 June 2004. The meeting was chaired by Mr C.Y. Lam (Hong Kong, China). Under its terms of reference, the ET/WFEU had to work on three broad areas namely: Further development of the SWIC and WWIS Web sites; Providing guidance to Members on cross-border exchange issues as well as public forecast exchange over the Internet; and Developing guidance for Members on the risk management principles and securing funds from innovative sources.

The meeting discussed key points pertinent to its work, arising from a review of decisions of Congress XIV.

The key conclusions from the work of the Expert Team are summarised below.

TOR (a)

- The pilot project on severe weather information (SWIC) achieved global coverage of all tropical cyclone basins, in collaboration with relevant RSMCs, TCWCs, and NMSs, with dynamically updated pages.
- The Expert Team supported the introduction of a new page on heavy precipitation based on SYNOP reports and suggested the idea of further pages on thunderstorms, gales and extreme temperatures.

TOR (b)

- The pilot project on official city forecasts (WWIS) portrayed forecasts of 867 cities of 90 Members and climatological information of 1012 cities of 153 Members as of 9 June 2004. The information was available for download by Members through FTP since 2002 as well as in XML since early 2004.
- Graphical weather icons were introduced in 2003 and versions of the Web site in other languages had been put into operation viz Arabic (2003), Chinese and Portuguese (2004).
- Plans were in hand to add official weather observations and tourism-related information to the Web site and to enable the submission of information in XML or through Web form in other languages.

TOR (c)

- Contacts will be made with the tourism industry, international media outlets, and airline companies to promote the WWIS Web site.
- Promotional material on the WWIS will be distributed to Members before the next CBS meeting.
- Currently, Members use a variety of formats to submit their data for the WWIC and SWIC web sites. Until the sites become operational, the emphasis is on participation by Members, and moving toward a standard data exchange format in the future.

- The future trend on data exchange format is evolving from text to XML. Hong Kong, China is developing a generalized XML schema for the exchange of public weather forecasts over the Internet. The WWIS constituency will be involved in developing this general XML schema.

TOR (d)

- Promoting awareness of the published guidelines on cross-border exchange (PWS 9) among NMSs was considered. The ET proposed that a letter be sent from the Secretary-General to the Permanent Representatives to draw their attention to the contents of these guidelines. To this end, a letter was drafted for consideration by the Secretary-General.

TOR (e)

- The Expert Team was informed by the Secretariat that all the guidelines produced to date under the PWS series technical documents to date have been placed on the PWS home page and are accessible for download.

TOR (f)

- This new term of reference relates to the development of risk management guidelines, the provision of advice to NMSs and securing additional funding.
- During the meeting, considerable progress was made by the Expert Team in developing the guidelines.
- Impetus for the task has been provided by the increasing international recognition given to disaster mitigation, including the initiation of a new major program on disaster mitigation and prevention by WMO.

1. INTRODUCTION

1.1 Météo France kindly agreed to host a meeting of the Public Weather Services (PWS) Expert Team on Warnings and Forecasts Exchange, Understanding and Use which was held at the offices of Météo France in Paris from 31 May to 4 June 2004. The meeting was chaired by Mr C.Y. Lam (Hong Kong, China). Ms Haleh Kootval (Chief, Public Weather Services Division, WMO Secretariat) welcomed the participants on behalf of the Secretary-General and briefed them on the recent meetings of the Open Programme Area Group (OPAG) on PWS including those of the Implementation Coordination Team (ICT) and the Expert Team on Product Development and Service Assessment (ET/PDSA) which would have direct bearing on the work of the ET/WFEU. She also highlighted the objectives and expected outcome of the meeting of the Expert Team. She drew attention to the Team's Terms of Reference (TOR) as approved by the CBS as follows:

- (a) **Develop further the concept and conduct pilot tests on improved international availability and access of NMSs' official severe weather information via the Internet (SWIC);**
- (b) **Continue to develop the official city forecast Web site (WWIS) and explore its potential both for conveying other information and for developing the Web site in other languages, in addition to English;**
- (c) **Promote awareness of, and provide guidance to Members on the exchange of public weather forecasts on the Internet;**
- (d) **Provide guidance to Members on the implementation of cross-border exchange of forecasts and warnings;**
- (e) **Make available on the Internet the guidance material on improving public understanding of, and response to, warnings;**
- (f) **Develop guidance for Members on the application of risk management principles in the provision of severe weather warnings, and use of this approach in efforts to secure extra funding from innovative sources.**

1.2 The meeting began its work with reports prepared by individual team members or sub-groups according to their responsibilities within the team. Each sub-group discussed its TORs and prepared a separate report on the details of its work for inclusion in the final report of the meeting. It also reviewed the guidelines provided for the future work of the PWS Programme by WMO Fourteenth Congress.

1.3 The ET was pleased that Mr Frédéric Chavaux, responsible for general forecasting in Toulouse was able to join the meeting for two days to contribute to the discussions of the Expert Team, in particular on cross-border exchange issue. The list of participants is given in Annex I. The programme of the meeting is contained in Annex II.

2. BACKGROUND

2.1 The meeting was informed by Ms Kootval that the Extraordinary Session of the Commission for Basic Systems (CBS) (Cairns, Australia, December 2002) had approved the TORs of the Open Programme Area Group (OPAG) on PWS as proposed by the Implementation Coordination Team on PWS. CBS had agreed that the work of the PWS Programme should continue to be coordinated through the Expert Team on Product Development and Service Assessment (ET/PDSA); the Expert Team on Media Issues

(ET/MI); the Expert Team on Warnings and Forecasts Exchange, Understanding and Use (ET/WFEU); and the Implementation/Coordination (IC) Team. The TORs for all the teams had been modified to reflect the areas of work still outstanding, or those which needed emphasis in each team. Subsequent changes were made in the membership of each team based on the areas of expertise required to complete the assigned TORs.

2.2 The results of work under the various TORs of the Expert Team are summarized below.

3. REVIEW OF THE DECISIONS OF CONGRESS-XIV

3.1 The Expert Team discussed the decisions of Congress as regards the important issues facing PWS relating to its own work and future directions of the programme as approved by Congress.

3.2 Congress had expressed satisfaction with the development of the PWS Programme since its last session. In particular Congress welcomed the excellent work on and outstanding results from the two pilot projects on Web sites for official cities forecasts and for warnings.

3.3 Taking into account the guidance from Congress, the ET identified the following areas of work requiring priority attention:

- The role of PWS in support of safety of life and property and the contribution this makes to the overall thrust of the WMO Programme on Disaster Prevention and Mitigation;
- Regional and global exchange and coordination of routine weather information including warnings, and establishment of appropriate agreements and procedures for such exchanges;
- Raising the level of visibility and public awareness of NMSs as sole, official authority for issuing severe weather warnings.

4. ET/WFEU WORK PROGRAMME

4.1 TOR (a). Develop further the concept and conduct pilot tests on improved international availability and access of NMSs' official severe weather information via the Internet (SWIC) <http://severe.worldweather.org>;

4.1.1 Under this TOR, the Expert Team Chair reported on the progress as regards the SWIC pilot project since the last ET meeting held in Hong Kong in 2002. The site was developed to provide basic information for the use of the public and the media.

4.1.2 The SWIC Web site has been implemented in phases and in close cooperation with the WMO Tropical Cyclone Programme, relevant RSMCs, Tropical Cyclone Warning Centres (TCWCs), and NMSs. The SWIC site features dynamically updated pages covering all tropical cyclone basins (Figure1).

4.1.3 The SWIC Web site, still in English only for the time being, was thoroughly tested during the 2002 and 2003 tropical cyclone seasons. The highest monthly hit rate recorded was more than 1.3 million page views during September 2003 when tropical cyclones were active in the Northern Hemisphere (Figure 2).

4.1.4 Since February 2004, a new web page (beta version) for displaying heavy rain or snow has been added to the Web site (Figure 3). The product is generated automatically by reading the 6-hourly or 24-hourly precipitation amounts from more than 10,000 SYNOP reports received via GTS 6-hour intervals. Stations with precipitation above 50 mm in the past 24 hours are shown on a world map to indicate locations of heavy rain (or snow). The Expert Team welcomed this initiative and supported the inclusion of this new page in the pilot Web site.

4.1.5 The Expert Team discussed potential development areas for the SWIC Web site. The addition of observations of thunderstorms and gales based on SYNOP reports was suggested. Hong Kong, China will contact Members participating in the WWIS pilot project on the relative priority. The Expert Team also suggested that consideration be given to a Web page on extreme temperatures and noted that it would be necessary to coordinate with relevant WMO programmes on the approach to be taken.

4.1.6 The ET discussed the desirability of collecting the views of the users of the Web site through a survey sheet to be posted on the site. It viewed such a survey sheet developed by the Australian Bureau of Meteorology and agreed to follow a similar pattern for the SWIC survey. In addition, the ET expressed interest in establishing links between the SWIC and EMMA Web sites when EMMA becomes officially operational.

4.2 TOR (b). Continue to develop the official city forecast Web site (WWIS) and explore its potential both for conveying other information and for developing the Web site in other languages, in addition to English; (<http://www.worldweather.org>)

4.2.1 The ET Chair further briefed the meeting on the current status of the WWIS pilot project. The WWIS web site continues to gain support from within the WMO community since its official launch on 9 December 2002. As at 9 June 2004 onwards, 90 Members are providing forecasts for 867 cities (see Tables 1 and 2). Climatological information for 1012 cities from 153 Members are available. The hit rate was around 240,000 page visits per day on average in April 2004 (Figure 4), thus confirming the Web site as a good means to promote Members' visibility within the Internet community. The ET was pleased to learn that the International Labour Organization (ILO) had recently requested permission to link its own Intranet to the WWIS site.

Table 1. Participation of WMO Members in WWIS (as at 9 June 2004)

WWIS in All Regions	No. of Members providing forecasts	No. of cities
RA I - Africa	12	54
RA II – Asia	25	183
RA III – South America	5	49
RA IV – North and Central America	6	209
RA VI – South West Pacific	9	214
RA VI - Europe	35	158
Total	90 *	867

(* two are Members of more than one Region)

4.2.2 The Web site supports communication through the GTS nodes, FTP, email, direct extraction from Members' web site as well as the use of a web-based form to enable participation of all Members (see Table 2). The diversity of input methods is intended to match the wide range of technological capability among WMO Members. Special steps have been taken to enable Least Developed Countries to join the project.

Table 2. Input Methods of Participation of WMO Members in WWIS

Forecast Input Method	No. of Members providing forecasts
GTS	28
AFTN	3
FTP	20
Web Form	12
Email	44

Note: Some Members are using more than one method to provide forecasts.

4.2.3 To enable participating Members to make official city forecasts available for their local public and media, participating Members can since September 2002 also download from an FTP server collated city forecasts derived from the WWIS Web site. In 2004, an XML feed of weather forecasts and climatological information in the WWIS was developed and is ready for use by active contributing Members. Graphical icons, in addition to text-based weather messages, were also introduced in 2003.

4.2.4 The pilot project has expanded its accessibility with the setting up of multi-language versions of the WWIS (Figure 5). Oman launched the Arabic version of the Web site in May 2003. China launched the Chinese version in March 2004 while Macao, China in cooperation with Portugal, at the same time launched the Portuguese version. It is understood that France is helping to identify a potential host for a French version of the WWIS.

4.2.5 In late 2003, to promote the Web site to the global travelling public, letters were sent to over 1300 local travel agents in Hong Kong as well as tourist boards and associations elsewhere in the world. A bilingual pamphlet in English and Chinese on the WWIS and SWIC was produced. The ET suggested that the pamphlet be made downloadable. At the suggestion of WWIS Members, links to official tourism board Web sites of individual Members have been added to respective Member's city forecast page since early 2004.

4.2.6 Possible future development include versions of the Web site in even more languages to enhance accessibility, development of standardized XML format for submission of weather data to WWIS and the display of official weather observations, subject to consultation with contributing Members. Provision of maps and thumbnails of displayed cities and connecting the site to other organizations such as tourism industry was also discussed.

4.2.7 Work is in progress to develop a city forecast submission web form with a Spanish data entry interface to make it easier for Spanish-speaking Members to prepare and submit the city forecasts in English. If this approach is found successful in attracting more participants, web forms for other major languages might also be considered.

4.2.8 The ET discussed the following matters raised at the OPAG/ICT meeting held in Hong Kong, China in November 2003;

- (a) The WWIS Web site could be declared operational when the number of participating Members reaches 100.
- (b) On the issue of making the information collected for the WWIS Web site more generally available outside the WMO community for free or at cost, following considerable discussion, the ET agreed not to pursue the subject further.
- (c) The resource to support the long-term maintenance and development of the Web sites should be considered although Hong Kong, China foresees no difficulty in providing the resources for the time being.
- (d) Similarly, the ET agreed that provision of forecast verification statistics by participating Members was not a high priority issue for the time being.
- (e) The ET stressed again that the media should be urged to carry attribution messages for the collective WMO membership.

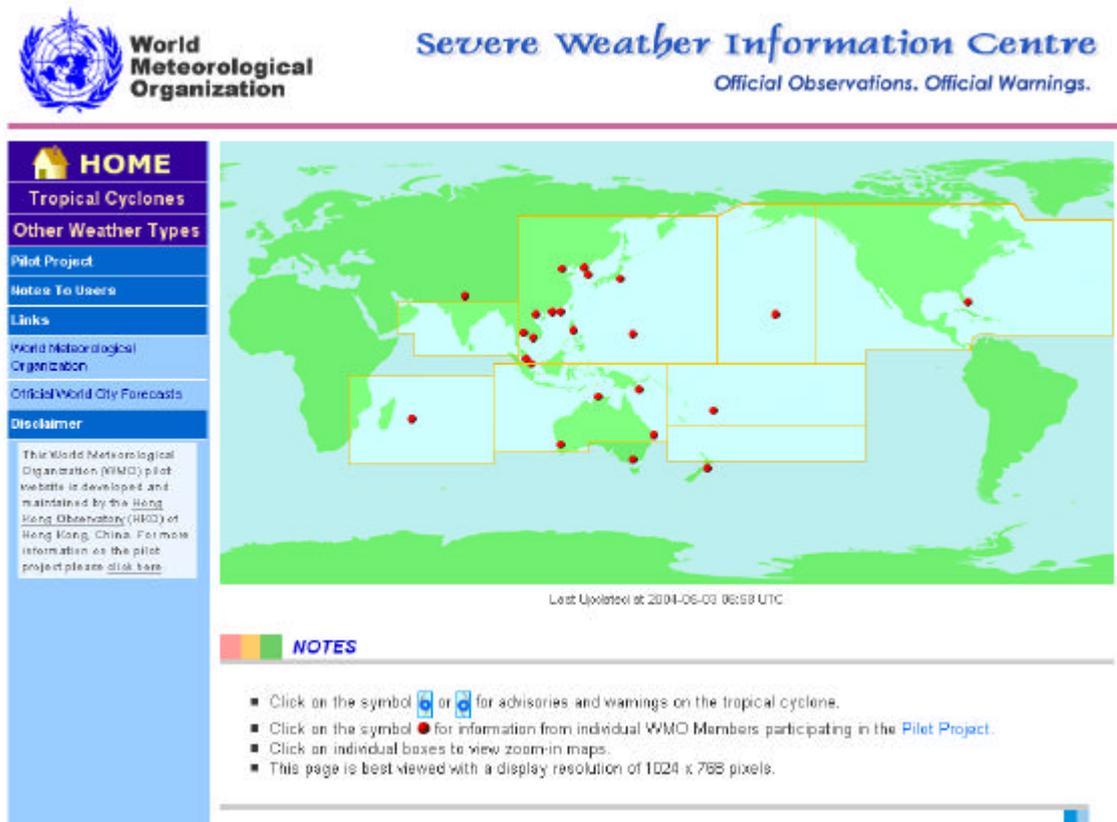


Figure 1. The front page of the SWIC Web site

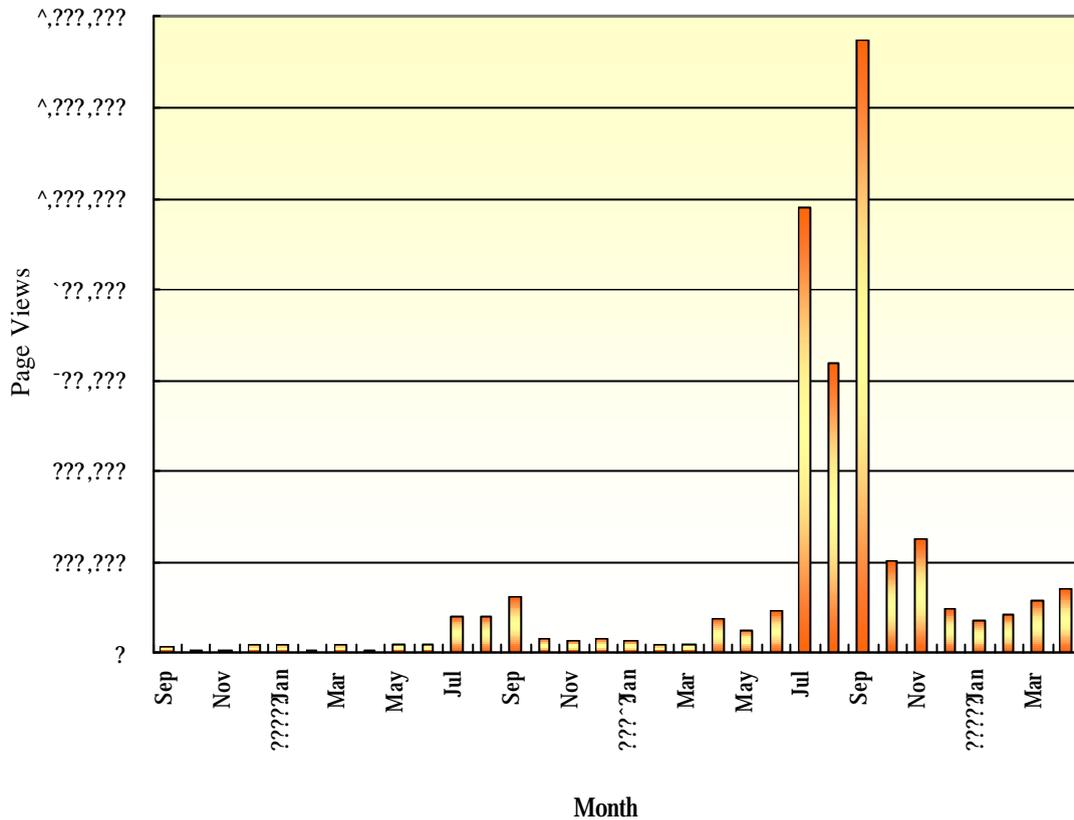


Figure 2. Monthly page hit of the SWIC Web site.

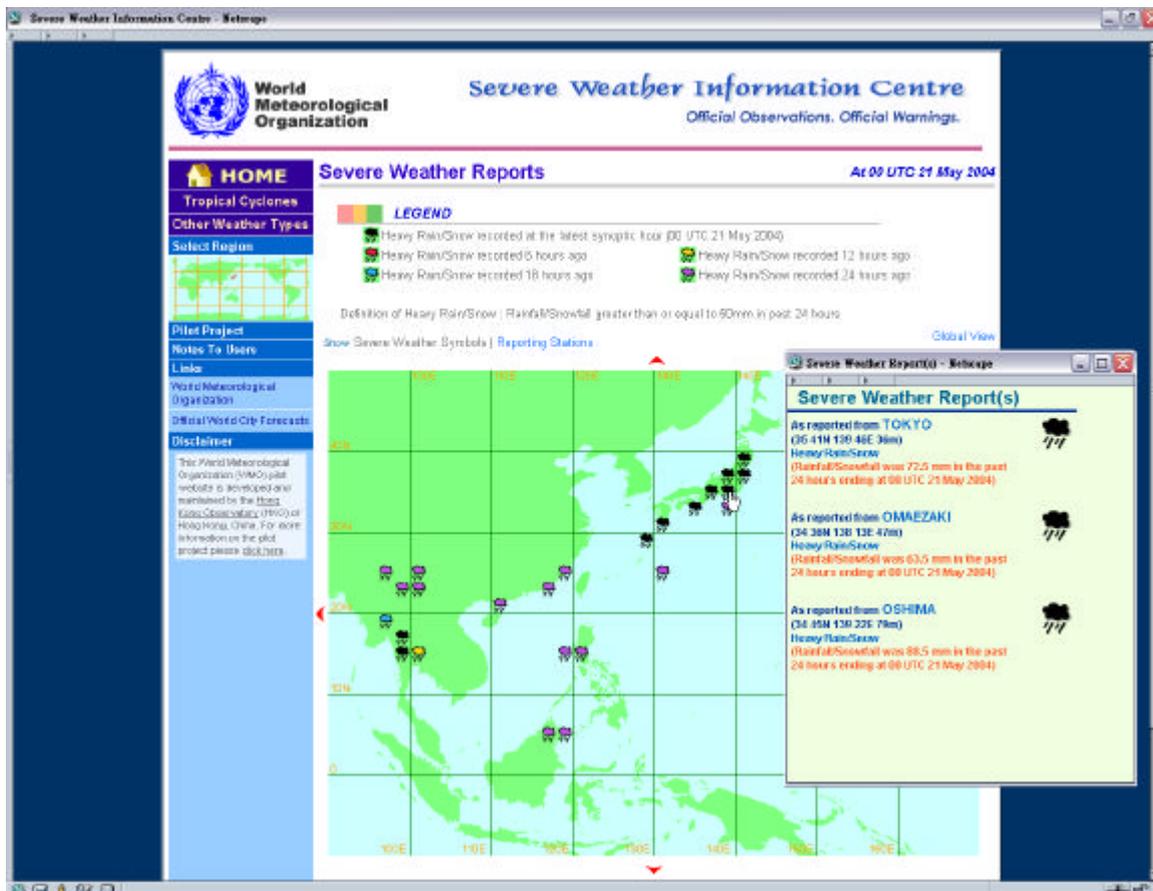


Figure 3. A new product displaying heavy rain or snow for SWIC

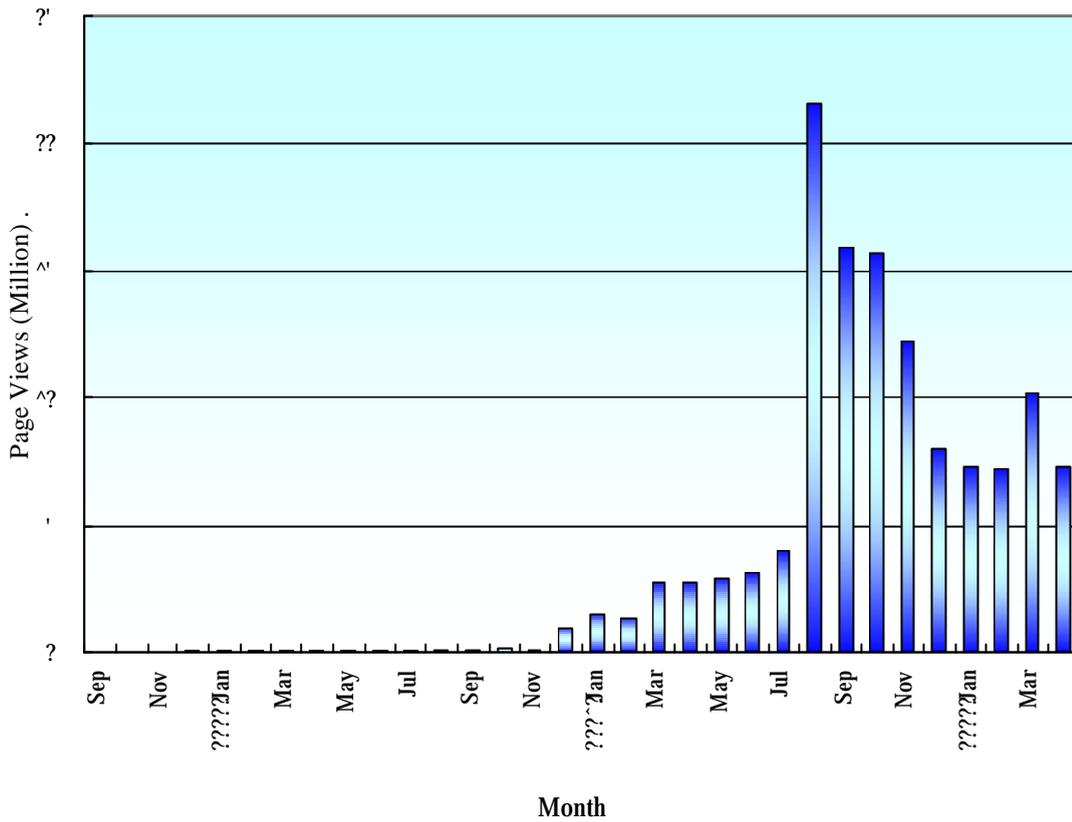


Figure 4. Monthly page hit of the WWIS Web site



Figure 5(a). Chinese version of the WWIS Web site

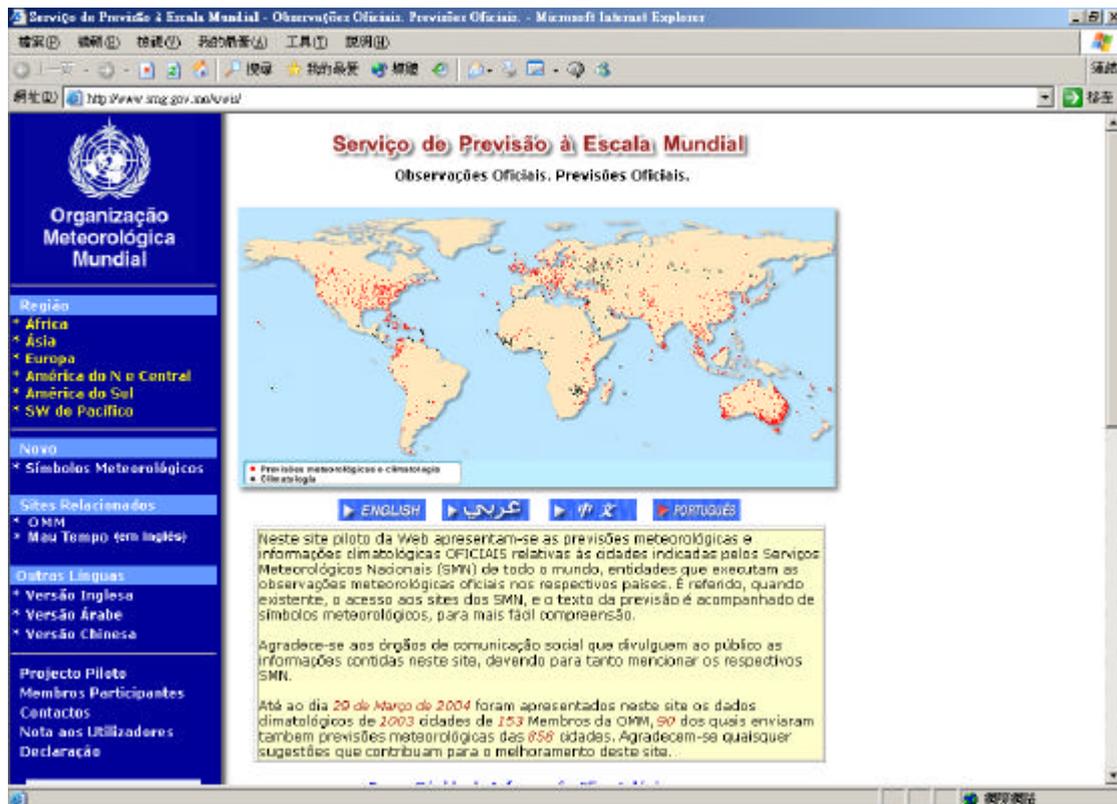


Figure 5(b). Portuguese version of the WWIS Web site



Figure 5 (c). Arabic version of the WWIS Web site

4.3 TOR (c). Promote awareness of, and provide guidance to Members on the exchange of public weather forecasts on the Internet

4.3.1 Chris Alex summarized the progress on this TOR. The key issues discussed were (1) promoting awareness of the exchange on the Internet; and (2) the technical aspects of exchange, such as formats.

4.3.2 Several initiatives to promote awareness of the exchange on the Internet were discussed. Hong Kong, China organized a "Training Course on Provision of Weather Service via the Internet" for WMO under VCP. The objective of this course was to enhance the capability of trainees in working with diverse meteorological information available on the Internet. The course was conducted in Hong Kong, China twice – in December 2003 and March 2004 – for participants from 16 countries.

4.3.3 The Chairman of ET/MI had agreed to help promote the WWIS and SWIC web sites at the IABM conference in Barcelona in June 2004.

4.3.4 The next targets for outreach are the international tourism industry and major international media outlets. Hong Kong, China has agreed to write to the World Tourism Organization to enquire about the availability of a data base of tourism agencies to be contacted as part of promoting the Web sites. In addition, Hong Kong, China will contact major airline companies to encourage them to link to WWIS.

4.3.5 Before the next session of CBS, Hong Kong, China will draft promotional material on the WWIS which will be distributed through the Regional Rapporteurs. NMSs could attach the material to products or press releases to the public and the media.

4.3.6 Hong Kong, China will continue to work towards increasing the likelihood that the most prominent web search engines will present links to WWIS and SWIC near the top of their search listings.

4.3.7 The ET suggested adding a brief questionnaire to WWIS to get feedback from users. The Australian Bureau of Meteorology has gained valuable feedback from their users via questionnaires. Hong Kong, China will take the lead on developing the questions, and will provide them to the ET/WAFU members for comment and review.

4.3.8 Regarding the technical aspects of exchange, Hong Kong, China continues to allow Members flexibility to select one of five methods to submit their data for the WWIC and SWIC web sites. A recommended format for data submission to WWIS/SWIC has been in place for several years. Until the sites become operational, the emphasis is on participation by Members, and moving toward a standard data exchange format in the future. The ET Chair will provide the recommended format for data submission to ET/WFEU members and active participating Members in the WWIS for review and feedback.

4.3.9 The future trend on data exchange format is evolving from text to eXtensible Markup Language (XML). Moving in that direction, Hong Kong, China has established an XML web site for automatic download of the city forecasts by the WWIS constituency. Hong Kong, China is developing a more generalized XML schema for the exchange of public weather forecasts over the Internet. The WWIS constituency will be involved in developing this general XML schema.

4.4 TOR (d). Provide guidance to Members on the implementation of cross-border exchange of forecasts and warnings

4.4.1 Charles Dupuy led the discussion on this TOR, which concerned the implementation of cross-border exchange of forecasts and warnings as contained in the Technical Document PWS-9 "*guidelines on cross-border exchange of warnings*". It was concluded that the ET needed to define the target audience and the practical steps to be taken to reach it.

4.4.2 It was agreed that the most effective process to succeed in the implementation of the advice and recommendations contained in the guideline was to bring the publication to the direct attention of the WMO PRs.

4.4.3 Mr Chavaux (Meteo-France), who is currently in charge of the EUMETNET EMMA programme, informed the meeting on the progress of EMMA. The programme is currently in a demonstration phase and is undergoing tests among the participating NMSs. He also mentioned possible developments for a European Union project in the field of natural disaster risk management.

4.5 TOR (e). Make available on the Internet the guidance material on improving public understanding of, and response to, warnings

4.5.1 The representative of the WMO Secretariat reported that all guidance materials published to date in the form of technical documents under the PWS series had been placed on the PWS Web site.

4.6 TOR (f). Develop guidance for Members on the application of risk management principles in the provision of severe weather warnings, and use of this approach in efforts to secure extra funding from innovative sources.

4.6.1 A deliverable of the work of the ET/WFEU was the development of risk management guidelines and the provision of advice on securing additional funding as indicated in the TOR(f). Jim Davidson took the lead in discussing the results of his literature search into the topic which was followed by a constructive discussion between the team members.

4.6.2 The ET/WFEU acknowledged that disaster mitigation is now a recognized international priority and that WMO had accordingly initiated a new major program on natural disaster prevention and mitigation. The crosscutting program is aimed at enhancing international cooperation in the field of natural disaster activities.

4.6.3 Consensus was reached that the main purpose of preparing the guidelines was to recommend in some detail a risk management framework suitable for consideration by NMSs. It was also agreed that its scope will be broader than just the provision of severe weather warnings in due recognition of the emerging wider disaster management role of NMSs.

4.6.4 The ET/WFEU reaffirmed that severe weather warning systems constitute an essential and highly cost-effective component of local, regional and national strategies for natural disaster reduction and that these warning systems must be operated as the highest priority function of NMSs.

4.6.5 In the recommended risk management framework contained in the guidelines, the importance of developing and fostering partnerships with key stakeholders such as local authorities, emergency management agencies and the media will be highlighted. In regard to

the internal operations of an NMS, prominence will be given in the guidelines to capacity building of both forecasters and infrastructure and the cultivation of a user-driven outlook.

4.6.6 The ET/WFEU also recognized the desirability of creating and maintaining a range of risk management databases, supporting risk assessments for populated areas at potential threat, conducting cost-benefit analyses, and undertaking research into the various hazards. It will be proposed in the guidelines that substantial benefits may be realized through carrying out most of these initiatives in collaboration with NMS partners in the disaster risk management field.

4.6.7 Central to the recommended risk management framework will be a detailed discussion on how an NMS might approach the task of identifying, evaluating and treating the avoidable and manageable risks. The ET was of the view that it was desirable for WMO to provide expert assistance to NMSs in this respect.

4.6.8 Members of the ET/WFEU presented examples of NMSs successfully securing additional funding for their operations by building their case around the "emergency management agencies" theme in collaboration with partners possessing the same common interest. It was agreed to incorporate such examples into the guidelines for the reference of WMO members.

5. VISIT TO THE MÉTÉO-FRANCE REGIONAL MEDIA AND FORECASTING CENTRE

5.1 The ET paid a visit to the national media unit and the regional forecasting centre for Paris and surroundings on 3 June. It was briefed on the forecasting operations and on how weather information was conveyed to the public, the media and different sectors of the community. The ET expressed appreciation to Météo-France for the very informative tour.

6. FUTURE FOLLOW-UP

6.1 The ET agreed on the following schedule for the production and publication of the guidelines:

- **End of August 2004**, first draft of Jim Davidson will be circulated to the members of ET (including suggested pictures and graphics)
- Final draft to be prepared by **end of October 2004**
- Draft to be sent To the Secretariat for editing and arranging for its publication by the **end of 2004.**

7. CLOSING

7.1 The participants expressed appreciation to Météo-France for the excellent arrangements made and the warm hospitality provided in particular making special arrangements for the first day of the meeting, which coincided with a public holiday in France.

7.2 The meeting of the PWS ET/WFEU closed at 1215 on Friday 4 June 2004.

**PARTICIPANTS AT THE MEETING OF THE
EXPERT TEAM ON WARNINGS AND FORECAST EXCHANGE,
UNDERSTANDING AND USE**

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PUBLIC WEATHER SERVICES EXPERT TEAM ON WARNINGS AND FORECASTS EXCHANGE, UNDERSTANDING AND USE (ET/WFEU)
(Paris, France, 31 May-4 June 2004)

PROVISIONAL PROGRAMME

	Monday, 31 May	Tuesday, 1 June	Wednesday, 2 June	Thursday, 3 June	Friday, 4 June
AM 0900	1. Opening 2. Background Information and Objectives (Secretariat) 3. Review of the decisions of Congress-XIV including emerging and important issues facing PWS and future directions (ET Chair and Secretariat)	TOR (c): Discussion of key issues led by Chris Alex	TOR (f): Discussion continued	5. Preparation of report of the ET	Preparation of report of the Expert Team (continue)
1200		TOR (d): Discussion of key issues led by Charles Dupuy	TOR (f): Drafting work on the guidelines		
	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
PM 1330	4. ET/WFEU work programme TORs (a,b): Report by: ET Chair and discussion of key issues	TOR (e): Report on actions taken (Secretariat)	TOR (f): Drafting work on the guidelines followed by discussions of draft	6. Visit to the Météo-France regional media and forecasting centre	7. Adoption of the report 8. Close
1700		TOR (f): Introduction of the TOR and status led by Jim Davidson			