

WORLD METEOROLOGICAL ORGANIZATION

Meeting of the Sub-group on Regional Aspects of PWS in RA-VI

Helsinki, Finland, 21-23 October 2008



WMO Sub-group on Regional Aspects of PWS in RA-VI

MEETING SUMMARY REPORT

INTRODUCTION

The WMO Sub-group on Regional Aspects of Public Weather Services in RA-VI met at the Finnish Meteorological Institute (FMI) in Helsinki, Finland on 21 October 2008. The Co-ordinator of the Sub-group, Mr Dave Robinson, United Kingdom Met Office, opened the meeting and introduced the hosts.

Dr Juhani Damski, Director Weather and Safety Division at FMI, gave a presentation on the re-organisation of FMI which is now composed of two (2) main divisions: (i.) Weather and Safety; and, (ii.) Research and Development. The FMI provides both basic PWS and added-value commercial services. Dr Damski pointed out that FMI is heading towards forecasting impacts and optimisation of customer activities – FMI consulting specialists work closely together with the customer. He further stated that since the customer is not concerned about the weather, but wants to know the impacts, that the National Meteorological and Hydrological Services (NMHSs) must form allegiances with the customer, otherwise they will be reduced to the role of mere data provider in the future.

Transport is a good example of FMI operations and highlights forecasting impacts and optimising their customers' activities. One of FMI's major funders is the Finnish Ministry of Transport. Web portals provide operational transport weather information, but consultants are also available 24/7 either by phone or in person. The commercial arm of FMI is a separate subsidiary, accommodated with a customer interface in the same FMI building. The FMI's future commercial aims are directed towards highly tailored projects (including air quality, climate change, probabilistic and seasonal forecasting and Nowcasting).

Dr Damski concluded his presentation by suggesting that the socio-economic value of FMI's output for selected customer sectors, derived from an independently-commissioned study, was in the region of 239-303 million Euros (from total funding of ~50m Euros). The scope of the study excluded FMI's services to government authority sectors, such as civil protection and societal impact of several types of weather warnings.

Agenda and Actions of the Meeting

The Co-ordinator called for any changes to the agenda (*see Annex A*) and reminded Members of the need to have the agreed upon actions completed in a timely manner.

Actions from the last meeting (Langen, Germany, 29-31 August 2007) were reviewed – *a summary of these actions are reproduced in Annex B to this report*. Mr Robinson questioned whether there was a need to review the Terms of Reference (ToRs) of the Sub-group, and expressed the opinion that they should be revised before the next RA-VI meeting. This was agreed upon by the Members (*revised ToRs provided as Annex C*). He also asked whether socio-economic value was to become the next major theme of the Group, stating that if a major theme was not agreed and included in the work packages for the Sub-group, then its future would not be clear. A discussion amongst the Sub-group Members took place over the role of the NMHS: would it be confined to issuing warnings or to become involved in forecasting impacts? The Co-ordinator pointed out that METEOALARM was already moving towards impact forecasting such as forest fire and was considering becoming involved in flood forecasts as well. In addition, METEOALARM wished to supplement these warnings with further information which would give guidance to the public in respect to the particular hazard.

Probabilistic Forecasting

Mr Robinson gave a presentation on probability forecasting in flood risk management in relation to UK experiences. The Pitt review followed the widespread flooding in the UK over the summer of 2007, and recognised that the Met Office needed to work much more closely with the UK Environment Agency (EA) to improve the ability to forecast floods. The review also recognised

the communications with the public and emergency response community needed to be improved to fill the gap between a probabilistic weather warning issued several days before an event and a deterministic flood warning that may only be issued one to three (1-3) hours before the event. He questioned the use of the word “warning” in the context of weather, and pointed out that a probabilistic warning forecast is considered more as information or as an ‘alert’.

The Co-ordinator pointed out that the results of the review would not be made available to the public until December 2008, but that the review has visited France to look at Service Central d'Hydrométéorologie et d'Appui à la Prévision des Inondations (SCHAPI) to establish whether this was a model of best practice to follow.

Probabilistic forecast products in DWD

Mr Axel Thomalla from Deutscher Wetterdienst (DWD), introduced his presentation on probabilistic forecast products currently used in DWD, outlining that various customer services and projects were under way. Probabilistic products included model output statistic (MOS) and ensembles, interpretation of which was subjective. Germany currently issues warnings in 450 districts, giving hourly probabilities for 150 criteria. Mr Thomalla outlined the WarnMos system, which remains internal at the moment. A lightning prediction system BlitzMOS, mainly used by aviation customers (which DWD has run since 2000 / 2001), was also showcased. The DWD use VarEPS (10-32 days), as well as the standard European Centre for Medium-Range Weather Forecasts (ECMWF) products. The COSMO LEPS start with nesting of 16 ECMWF postage stamps based on clusters.

He indicated that civil contingencies / disaster management authorities often are old fashioned and do not like probabilities, and that they want deterministic warnings with increasing demand for longer-range outlooks (notably also from media and utilities). Mr Robinson asked the Sub-group to encourage less-developed countries to use probabilities, but urged that NMHSs must also present the usefulness of probabilities in compelling fashion to their customers as well. Mr Thomalla informed the meeting further that DWD performs probabilistic seasonal energy sector forecasts. There will also be seasonal forecasts for the public on the DWD website from the end of 2008 (based on ECMWF output). Monthly forecasts will also be operational by the end of 2008. One of DWD's main projects at the moment is AutoWARN – part of the DWD 2006-2015 strategy, which will allow the NMHS to centralise and automate functions and to produce probabilistic warning information thus capturing their “create once, use many times” philosophy.

WMO Guidelines on the Communication of Probabilistic Forecasts

Ms Kootval, Chief of Public Weather Services, WMO Secretariat, briefly drew the Sub-group's attention to the existence of WMO Guidelines on Communication of Probabilistic Forecasts. The recent Shanghai ICT meeting (May 2008) produced a publication on this topic, though it was agreed that it was difficult to find such documents on the WMO website.

ACTION (1) (31/12/2008; see Annex D) – *it was agreed that the PWS Sub-group Chairperson, Mr Robinson, write to the Secretary-General of WMO to request simplification of process of finding items and material on the WMO website.*

METEOALARM: Plans to introduce probabilistic forecasts targeted at civil protection partners; Outcomes of the Standing International Road Weather Commission (SIRWEC) Conference

Mr Jan Sulan from the Czech Hydrometeorological Institute (CHMI), gave a presentation on the Network of European Meteorological Services EUMETNET Programme METEOALARM's plans to introduce probabilistic forecasts targeted at civil protection partners (*more of which is summarised in the next section*), as well as summaries of the SIRWEC and LAKESIDE conferences in 2008. The SIRWEC is a road forecasting conference, whilst LAKESIDE concerns traffic and Road Weather Information Systems (RWIS).

In the ensuing discussion, FMI advised that their road forecasting system was based on 25 years of working with their customers – there is much competition for road forecasting in Finland (indeed, FMI lost the government road contract for one (1) year at one point); warnings are produced by the public services, plus commercial work. Road servicing is a larger industry than just meteorology, but meteorological information is fed into the process. Mr Robinson stated that more involvement of less-developed countries in Europe was needed in PWS meetings. These smaller NMHSs could lose out to larger private companies (e.g., – WSI that aggressively market their products for road forecasting, if they are not given proper guidance. Norway advised that there is no competition for the NMHS in their country, as roads are national infrastructures. The Chairperson suggested that less-developed countries should follow the Norway model and define road forecasting as a public service.

Review of METEOALARM

Following Mr Sulan's presentation, Ms Hannele Kaija from FMI, briefly discussed the current status and plans of METEOALARM. The website receives up to a maximum of 100K hits / day, with an average of 18K hits. Ms Kaija expressed the opinion that as cross-border travelling increases, the demand for more countries to be included would also increase, extending into the wider RA-VI, while plans also include expansion into in-country region displays. More functions were also planned, including parameters such as coastal warnings; user feedback; RSS feeds for third party service providers (e.g., - webscraping – IPR issues); a password protected website function for the EC Monitoring and Information Centre (MIC); harmonization of warnings and quality-control; and filling gaps in existing service provision.

Mr Ali Price from the United Kingdom Met Office, informed the Sub-group that these planned expansions must now be in some doubt as EUMETNET Council had limited increases of the EUMETNET budget to an "operational" level for the time being. Some discussion ensued around the table on the relative value of METEOALARM to the different NMHSs.

Severe weather warnings and the psychological pressures on forecasters issuing them

Dr Herbert Gmoser from Zentralanstalt für Meteorologie und Geodynamik (ZAMG), gave a presentation on the issuing of severe weather warnings within the Austrian Meteorological Service and the psychological pressure associated with that experienced by forecasters. Dr Gmoser's report was based on a questionnaire posed to an informal group of 26 forecasters from the Informal Conference of Western Europe Directors (of National Meteorological Services) (ICWED) region. Most forecasters feel stressed when connecting their warnings to damages. Much discussion followed, and it was agreed that the NMHSs needed to have proper procedures in place to avoid placing the forecaster under any unnecessary stress. Advice on improving such procedures was seen as the best way to help rectify the situation.

ACTION (2) (05/10/2009; see Annex D) – Dr Gmoser to provide reasoning for guidelines on severe weather warnings for next years.

Revision of Terms of Reference (ToRs) for the PWS Sub-group and discussions with the Disaster Risk Reduction (DRR) Working Group

On Wednesday, 22 October 2009, the Chair opened the session, and suggested that rather than formal presentation, the Sub-group should have a discussion on the ToRs for the proposed framework theme (*the socio-economic value of PWS*) of the Group for the future. (*Note: the revised ToRs can be found at Annex C to this report).

A short discussion was also held at this point regarding the role of the DRR Working Group (Disaster Risk Reduction, formerly Disaster Prevention & Mitigation, DPM), who meet separately from the PWS Sub-group, but cover similar issues – leading to the possibility of unnecessary duplication of effort. Ms Kootval confirmed that there was now a WMO internal

department called Weather and Disaster Risk Services – which PWS is placed within. It was agreed that the DRR and PWS Programmes goals are too similar in scope, and that better internal communication was required. The DRR Programme is now moving towards insurance / re-insurance and civil protection issues at international and regional levels, whereas PWS focuses on issues of operational practices of NMHSs and their coordination with the user communities.

Mr Martti Heikinheimo, Co-ordinator of the Disaster Risk Reduction Working Group at FMI, joined the discussion and advised that *the* big group of DRR customers are civil contingencies communities. The DRR Programme has done regional assessment on needs and capacities, but now should move forward, and the PWS and DRR Groups should not overlap on work. Indeed, the best solution would be for these groups to be merged, or meet together to make best use of resources.

Socio-economic benefits of PWS – Requirement for NHMSs to provide an integrated range of services to meet community needs

A wider discussion followed, on where WMO needs to go with the issue of socio-economic benefits. Mr Robinson pointed out that NMHSs deliver their public weather services differently. The UK and Finland have done work on the socio-economic value of PWS, including the potential cost-saving to the nation as a tool to actually leverage funding from their respective governments. The NMHSs have to be able to demonstrate realizable benefits of their warning schemes compared to the cost of such warnings. Mr Alexcy Lyakhov from Roshydromet, Russian Federation, added that Roshydromet was currently undergoing many changes following its own process of demonstrating benefits to its stakeholders. Mr Robinson concluded that the PWS Sub-group needs to provide a framework to help lesser-developed countries in RA-VI through the lessons learned by the Sub-group.

Mr Thomalla informed the Sub-group that DWD had not made an investigation into socio-economic benefit to this point, and that it *counted only costs, not benefits* (unlike FMI and the UK). The WMO should encourage NMHSs to show the value of services to the public. The PWS Workshop on Socio-Economic issues, which was held in Sofia, Bulgaria, September 2008, attempted to quantify the benefits, but struggled on how to talk to decision makers to ascertain value. Cost is easier to calculate, whereas benefits are much more difficult. Also, one must ask the right questions when talking to experts. Dr Stan-Sion from the National Meteorological Administration (NMA), Romania, claimed that the NMHSs can use the experience of events such as the Sofia Workshop to learn the process and put it into use as a way to defend NMHS budgets. Mr Robinson pointed out that NMHSs are not experts in this area, and that there was a need for the Sub-group to set out a framework of elements to help them where needed. It should be noted that the Sub-group was not tasked to actually work out socio-economic benefits by itself.

Following this exchange, Mr Markku Seppanen from FMI, gave a brief presentation on socio-economic benefit from the Technical Research Centre of Finland, Research Report 2007 (requested as an independent study by FMI). The UK had also asked for an external report, with each sector evaluated separately though according to a common evaluation strategy. The electricity cost alone for the UK High Performance Computer (HPC) is very high, but unless one tracks these costs against individual products and services then how can the socio-economic benefits can be assessed? Pricing models can be simple, but if one does not get the infrastructure costs right then one cannot work out the socio-economic value properly. DWD also went through a similar process.

Questions were raised as to whether WMO provided guidelines for assessing benefits, and were these simply for basic warnings or other forecasts as well? Who are the users? What do they want? The NMHSs cannot concentrate just on public and civil contingencies. Mr Robinson also added that tourism sees a large impact from weather – any socio-economic benefit study should include tourism. This is a starting point for other sectors. It was agreed that the Sub-group provide a methodology for use by NMHSs in RA-VI for assessing socio-economic values,

step-by-step. The ToRs were proposed to cover this activity (see *Annex C*). Mr Thomalla will present the ToRs to the RA-VI Management Group for approval.

ACTION (3) (by next meeting; see *Annex D*) – FMI to provide a template for their socio-economic benefits questionnaire to Sub-group Members. Other Sub-group Members can suggest extra sectors to be added, collecting information from WMO Expert Teams and other NMHSs. Mr Seppanen and Ms Kaija from FMI to collect responses over the next year and one month before the next Sub-group meeting send the results to Mr Price (UK) for collation into a finalised questionnaire template. The UK to circulate the agreed template and bring back completed version to next PWS meeting.

ACTION (4) (1/11/2008; see *Annex D*) – Ms Kootval to circulate the information on the WMO PWS website and provide the necessary web link to background information that currently exists on socio-economic benefits to Sub-group Members.

Strategic approach to the future PWS role in RA-VI and consideration of how to implement the strategy

Mr Thomalla presented the recommendations and conclusions of the PWS Symposium (Geneva, Switzerland, 2007) and stated that the WMO Strategic Plan is based on 11 expected results. Regional Associations (RAs) must take this into account when they meet and decide about structure and ToRs of new Working Groups. RA-II will meet first, and then the RA-VI will follow with the regional conference next September in Brussels. The PWS Sub-group should provide input on how PWS in the future meets expected results in line with the recommendation of the Symposium. The Sub-group agreed that the three Expected Results (ERs) that are most relevant for PWS (ERs 6, 7 and 9) are: Service Delivery and Capacity-Building. A key PWS challenge will be the changing role of NMHSs with the main driving forces being: user needs; climate change (with focus on policy decision makers, the public, emergency services, etc.); the increasing vulnerability of society; socio-economic demands; lack of resources; and technical / scientific progress.

Mr Thomalla continued that in the future, DWD should concentrate on a seamless approach not only to weather but also to impacts. Proposals have included the development of services for sustainable energy management; traffic management; expected challenges from climate change (especially on small scale events, disaster management, health issues, food security and media).

How to build a strategic plan to meet society's needs? Special reference to RA-VI

Dr Stan-Sion gave a presentation on developing a strategic plan for meeting society's needs, with special reference to a 2007 training course for South Eastern European NMHSs on nowcasting and a workshop on economic and social benefits in Sofia in 2008. She posed the question on how to build a strategy to meet society's needs, citing the need to identify measures and adopt standards. What are the public's requirements? Do they match the objectives of an NMHS? Dr Stan-Sion suggested that the new PWS Sub-group ToRs should represent the direction of the Sub-group regarding issues of socio-economic value.

Norway's experience of aviation forecasting was discussed by Mr Tor Skaslien, where the focus is on products and not risk - the pilot must evaluate the risk. Risk is a financial exercise. Mr Robinson stated that civil contingencies are in fact most interested in business continuity and resilience. One example of this is the UK MO website, which used to receive ~1 million hits per day, but now receives up to 7 million hits per day due to the UK MO now being seen as the authoritative voice during high impact weather events. To raise their profile, the NMHSs need to get involved in key environmental meetings, not just when weather is the key issue. Dr Gmoser did not see it as the duty of this Sub-group to motivate the NMHSs on this point. Ms Kaija added that this was indeed not our field of expertise, but that we need to get better involved in the civil

contingencies exercises. Ms Kootval commented that NMHSs are important as one link in a long chain of actors in dealing with the warning issue.

Role of RA-VI in implementing the Madrid Action Plan (MAP)

Ms Kootval introduced the main themes from the Madrid Action Plan (MAP), 2007. The meeting in Madrid provided a forum for dialogue among producers and users of information, considering the major socio-economic groups, initiating and promoting new partnerships and ideas and promoting assessment of how valuable meteorological information is and how that benefit can be increased. The Action Plan needs to achieve some key milestones over the next five (5) years, including major enhancement in the value of meteorological information to society and an increase in the awareness among decision makers of the increasing ability of NMHSs to meet their needs. There are 15 actions in the Action Plan, which can more or less be divided into two components: capacity-building and partnership-building. There was some discussion of the various models for providing PWS exhibited by different NMHSs around the world, but it was agreed by the Sub-group that it should concentrate on the particular MAP Actions 7, 9 and 11.

Monthly and seasonal forecasts

Mr Ilkka Juga from FMI joined the Sub-group to give a brief guest presentation on seasonal forecasts in Finland, which mainly use ECMWF output for forecasts up to ten (10) days, with outlooks for the monthly and seasonal timescales (using EUROSIP multi-model ensemble products). Mr Juga outlined an increased commercial demand for seasonal forecasts at FMI (also in Germany and Austria). What is the role of monthly and seasonal forecasting in PWS – is it for early warning of anomalous weather? How then to deal with the media? The media will exaggerate trends if they are not communicated properly. What to tell the public when there is no signal? Recent winter was warmest ever in Finland (+5C for Helsinki) – the ECMWF anomaly was correct but not big enough to predict accurately. Dr Gmoser stated that Austria had overestimated their planned need for gas as it was too a mild winter – the gas was then stored to sell to the UK and Spain.

Mr Robinson stated that there was a need to improve the science and again quoted tourism as a growth area where the local economy and infrastructure requirement can be influenced by seasonal forecasts. Dr Stan-Sion added that in Romania, there was a higher demand for seasonal forecasts than for three (3) days ahead - seasonal forecasting is requisite for risk management. It was noted that the Romanian Ministry was unhappy with the NMHS, as it did not emphasise the impact of consecutive dry seasons, i.e., drought. Mr Robinson emphasised the need to give reference points on such forecasts, i.e., previous events, give a reference point for impact.

Evaluation of forecasts and warnings

On 23 October 2009, the Co-ordinator opened the session, stating that PWS comprises both forecasts and warnings and that evaluation / verification is needed for both. Mr Robinson continued that public perception of warnings verification was very important and should not be underestimated when justifying the cost of PWS. Verification measures alone are not sufficient – the key is about both perception as well as verification. Mr Robinson was able to inform the Sub-group that the Met Office had contracted an independent company (as part of a wider government initiative) to undertake national opinion poll studies on standards of PWS (including separate perception of forecast accuracy and reaction to severe weather warnings in the UK). Random surveys were conducted after warnings were issued (whether right or wrong). The public reach of the warning was also assessed – how many were aware of the warning? How useful were the warnings? Results showed that generally >80% would not change their plans as a result of being made aware of the hazard, but a significant factor may well be that weather in the UK is not usually life-threatening.

Leading on from the newly drafted ToRs, Mr Robinson stated that whilst ToRs should be kept relatively general, it was best to actually “do” things rather than simply “keep abreast” of these items. In this context, a new ToR (4) was added to the previous day’s efforts, requiring Mr Thomalla to act as focal point between the Expert Team on Services and Products Improvement (ET-SPI) and the PWS Sub-group. It was agreed that Mr Robinson would initiate this collaboration. It was also decided that Sub-group Members should contribute verification experiences to the next meeting.

ACTION (5) (31/12/2008; see *Annex D*) – Mr Robinson to write to the Chair of the ET-SPI to cooperate with WMO Expert Teams in technical and scientific developments, including verification, related to improved service delivery and share results within the region.

ACTION (6) (by next meeting; see *Annex D*) – Sub-group Members to present current verification schemes for warnings within their NMHSs, with best examples to be put forward to represent RA-VI.

Evaluation of national warnings

Dr Gmoser gave a presentation on the specifics of verification and evaluation of national warnings in Austria. The ZAMG evaluate weather forecasts and warnings in all nine (9) of the Austrian federal states, with focus in this presentation on the lower Austria region. Problems included “over-warning” (warnings issued for a whole region when only a small part may be affected, thus often meaning verification is poor) and an inability to verify properly in observation sparse areas. External *perception* was shown to be important – it is not as important if the warning itself is actually right or wrong. Probabilistic warnings are seen to be too complex for the Austrian user – there is a need to educate the end user. Regarding public perception, it was agreed by the Sub-group that warnings should be kept for severe events and should not be overused.

Demonstration of blended / e-learning - SATREP

Dr Gmoser set up a real-time live demonstration of the SATREP (SATREP is comprised of the words Satellite and Report) blended / e-learning system, in collaboration with other centres in Turku (FMI) and Zagreb (location of SATREP workshop). The SATREP is an online method of deriving a thorough view of the weather, using satellite images and other resources, advising on the recognition of cloud patterns by conceptual models. This partnership is run by EUMETSAT, Royal Netherlands Meteorological Institute (KNMI), FMI and ZAMG – and they hope to encourage further members to join now that the SATREP has become a EUMETNET Programme. The concept behind SATREP was to conduct 45 minute monthly online sessions, coordinated by ZAMG or FMI, alongside daily internal reviews. The cost of these monthly sessions was estimated by Mr Gmoser to be ~1000 Euros per session. The Sub-group advised that the problems of intellectual property should be carefully thought out.

Closure of the meeting

The Chair concluded the meeting and asked for offers to host the next meeting. At the closure of the meeting, an invitation was extended by Norway to host the next meeting of the Sub-group. This offer was graciously accepted (subject to formal confirmation) by all Sub-group Members.

**Agenda for Sub-group meeting on Regional Aspects of
Public Weather Services (PWS) in RA-VI, Helsinki, Finland, 21-23 October 2008**

Tuesday, 21 October 2008

- 0900 hours Opening of the meeting and welcome by **Dr Juhani Damski**, Director of Weather and Safety Division, FMI.
- Adoption of the agenda and review of actions from the last meeting (Langen, Germany, August 2007).
- 1030 hours *Coffee Break*
- 1050 hours **Mr Dave Robinson (Co-ordinator) - Themes for the Day: Use of i.) Probabilistic Forecasts; and, ii.) Severe Weather Warnings.**
- 1115 hours **Mr Axel Thomalla** - Probabilistic forecasts products in DWD.
- 1245 hours *Lunch*
- 1345 hours **Ms Haleh Kootval (followed by Group Discussion)** - WMO Guidelines on the Communication of Probabilistic Forecasts.
- 1445 hours **Mr Jan Sulan** - METEOALARM: Plans to introduce probabilistic forecasts targeted at civil protection partners; Outcome of the SIRWEC Conference.
- 1530 hours *Coffee Break*
- 1545 hours **Dr Herbert Gmoser** - Severe weather warnings and the psychological pressures on forecasters issuing them.
- 1630 hours **Ms Hannele Kaija** - Review of METEOALARM.
- 1700 –
1930 hours *Meeting Buffet, Dynamicum, 5th Floor.*

Wednesday, 22 October 2008

- 0900 hours **Mr Dave Robinson - Theme for the Day: Socio-economic benefits of PWS:** Requirement for NMHSs to provide an integrated range of services to meet community needs.
- 1000 hours **Mr Axel Thomalla** - Strategic approach to the future PWS role in RA-VI and consideration of how to implement the strategy: Recommendations and conclusions of the PWS Symposium (Geneva, Switzerland, 2007).
- 1045 hours *Coffee Break*
- 1100 hours **Dr Aurora Stan-Sion (followed by Group Discussion)** - How to build a strategic plan to meet society's needs? Special reference was made to RA-VI.
- 1245 hours *Lunch*

- 1345 hours **Ms Haleh Kootval** - Madrid Action Plan (MAP).
- 1445 hours **Group Discussion** - Role of RA-VI in implementing the Madrid Action Plan.
- 1545 hours *Coffee Break*
- 1600 hours **Mr Ilkka Juga** - Monthly and seasonal forecasts.
- 1700 -
1930 hours *Sandwich break; Introduction and adaption on Curling (Oulunkylä Curling Hall).*

Thursday, 23 October 2008

- 0900 hours **Mr Dave Robinson** - ***Theme for the Day: Evaluation of forecasts and warnings***
- Importance of public perception in forecast verification.
- 1000 hours **Dr Herbert Gmoser** - Evaluation of national warnings.
- 1030 hours *Coffee Break*
- 1045 hours Review of the report of the meeting.
- 1245 hours *Closure of the meeting.*
-

Review of status of existing ToRs and actions from the last session

ToR:	Action(s):	Outcome:
<p>1 - Develop documentation and advice on the regional aspects of the PWS Programme and its implementation, containing information:</p> <ul style="list-style-type: none"> • In liaison between the NMHSs, the media and others involved in the dissemination of public weather forecasts and warnings; and, • In collaboration between the NMHSs and disaster authorities. 	<p>Action: Ms Kootval to update the Romanian description and Messrs Robinson and Seppanen and Dr Gmoser to provide input from UK, Finland, Austria by November 2008.</p> <p>Action: Ms Hughes to send out final questionnaire to all members by 7 September 2007.</p>	<p>ONGOING. Ms Hughes circulated final questionnaire but not all results received.</p> <p><i>ACTION - Ms Stan-Sion to collect remaining questionnaire results – report back with summary of results highlighting areas of need and best practice for socio-economic value to bring back to next meeting. (Personal interest action – not included in final actions for this session).</i></p>
<p>2 - Keep abreast of and evaluate technical and scientific developments related to the formulation, presentation and dissemination techniques and make recommendations on a regional scale.</p>	<p>Action: Mr Robinson to discuss the Sub-group's concerns over feedback and harmonisation issues with Paul Davies (UK MO) who will ensure these are fed through to the METEOALARM Project Team by 30/09/2008.</p> <p>Action: Dr Stan-Sion to update the Sub-group on the work of the WMO JONAS (Joint Nowcasting Applications and Services) Steering Committee and to report back to the next Sub-group meeting on any relevant information from this working group.</p> <p>Action: Mr Robinson to draft a letter on behalf of the sub-group to EUMETNET / ECMWF in respect to access ECMWF output and severe weather events by 31/03/2008.</p> <p>Action: Ms Kootval to ensure a link to www.sirwec.org is added to the PWS WMO webpage.</p>	<p>COMPLETED.</p> <p>Effectively COMPLETED.</p> <p>NOT COMPLETED. ACTION on Dave Robinson to complete ECMWF letter (31/12/2008).</p> <p>COMPLETED.</p>

	<p>Action: Mr Jan Sulan to report back the outcomes of the SIRWEC meeting at the next Sub-group meeting.</p> <p>Action: Ms Kootval to circulate guidelines from Shanghai meeting to the Sub-group by 31 October 2008.</p>	<p>COMPLETED.</p> <p>COMPLETED.</p>
<p>3 - Review the status of the implementation of the pilot project of cross-border exchange and consider future developments in this area.</p>	<p>No further actions.</p>	<p>ToR CLOSED. No further actions.</p>
<p>4 - Continue activities in education and training to the PWS Programme.</p>	<p>Action: Mr Robinson to give a presentation to the next Sub-group meeting on what the UK Met Office does in relation to education.</p>	<p>COMPLETED – Mr Robinson gave presentation to Helsinki meeting.</p>
<p>5 - Develop guidance material on, and prepare common procedures for, verification of public forecasts and warning.</p>	<p>Action: Mr Robinson to present at the next Sub-group meeting a proposal of how to present verification information to the public.</p>	<p>ONGOING – Ms Hughes distributed material, verification ongoing theme.</p>
<p>6 - Elaborate proposals for demonstrating the benefits of PWS and heightening the visibility of NMHSs.</p>	<p>Action: Ms Kootval to report back on developments of the 'Learning through Doing' Project.</p> <p>Action: Dr Gmoser and Mr Thomalla to present on the appropriate methods of communicating ensemble / probabilistic information to the public at the next Sub-group meeting.</p> <p>Action: WMO Secretariat to provide a chart which details where this Sub-group sits in relation to other groups within WMO by 31/10/2008.</p>	<p>COMPLETED.</p> <p>COMPLETED.</p> <p>COMPLETED.</p>

	<p>Action: All to bring to next meeting examples of studies which attempt to quantify the socio-economic impacts of severe weather events in order to catalogue this information.</p> <p>Action: ALL by next meeting to have considered the proposals from the Shanghai meeting and to have contacted two or three (2 or 3) representatives from within RA-VI to provide Sub-group Members with contact details and identified NMHSs to approach). Co-ordinator of the Sub-group will feed this information to the ICT to help to inform strategy within the region.</p>	<p>COMPLETED - FMI</p> <p>ACTION DISCHARGED – Mr Thomalla completed. Mr Robinson did not attend the Shanghai ICT – <i>action closed</i></p>
<p>7 - Advise and report to the Co-ordinator of the working group and the association on all matters concerning the public weather service in the Region.</p>	<p>Action ongoing through the Co-ordinator of the Sub-group.</p>	<p>ToR CLOSED. No further actions.</p>
<p>8 - Represent the Region at sessions of the relevant CBS Implementation Coordination Teams on PWS through participation of its Co-ordinator.</p>	<p>Action ongoing through the Co-ordinator of the Sub-group.</p>	<p>ToR CLOSED. No further actions.</p>

Revised Draft Terms of Reference (ToRs) of the Sub-group on Regional Aspects of Public Weather Services (PWS) in RA-VI

These ToRs are drafted in response to Expected Results 6, 7 and 9 in the WMO Strategic Plan as most relevant to service delivery.

1. Elaborate proposals for implementing relevant actions of the Madrid Action Plan (MAP) with specific emphasis on socio-economic benefits;
2. Continue training activities in building capabilities relating to delivering services, with strong emphasis on e-learning;
3. Develop documentation and advice on the implementation of the PWS Programme relevant to the region, containing information on:
 - Liaison between NMHSs and the media and others involved in the dissemination of forecasts and warnings; and,
 - Strengthening links and collaboration between NMHSs and disaster risk management authorities;
4. Cooperate with WMO Expert Teams in technical and scientific developments, including verification, related to improved service delivery and share results within the region;
5. Share experiences in developing dialogue and collaboration between NHMSs and user sectors with all members in the region;
6. Share experience on how to measure public perception in respect to both warnings and forecasts, with a view to providing guidance and advice to other members within the region;
7. Ensure that the NMHS Focal Points are kept abreast of the work of the Sub-group;
8. Advise and report to the co-ordinator of the working group and the association on all matters concerning the public weather service in the Region; and,
9. Represent the Region at sessions of the relevant CBS Implementation and Coordination Team.

Revised list of currently pending actions**Probabilistic forecasts:**

ACTION (1) (31/12/2008) – Re: WMO Guidelines on Probabilistic Forecasts, the PWS Sub-group Chair, Mr Robinson, is to write to the Secretary-General of WMO to request simplification of process of finding items and material on the WMO website.

Severe weather warnings:

ACTION (2) (05/10/2009) – Mr Gmoser to provide reasoning for guidelines on severe weather warnings to next year's meeting.

Socio-economics benefits:

ACTION (3) (by next meeting) – FMI to provide template for their socio-economic benefits questionnaire to Sub-group Members, then other group members can suggest extra sectors to be added, collecting info from WMO Expert Teams and met services. FMI's Mr Seppanen and Ms Kaija, to collect responses over the next year, then one month before the next Sub-group meeting send results on to Mr Price (UK) for collation into a finalised questionnaire template. The UK to circulate agreed template and then bring back completed version to next PWS meeting.

ACTION (4) (1/11/2008) – circulate info on PWS website. Ms Kootval to circulate information on the WMO PWS website and provide the necessary web link to background info that currently exists on socio-economic benefits to Sub-group Members.

Perception of forecasts:

ACTION (5) (31/12/2008) – Mr Robinson to write to Chair of the ET-SPI group to cooperate with WMO Expert Teams in technical and scientific developments, including verification, related to improved service delivery and share results within the region.

ACTION (6) (by next meeting) – Sub-group Members to present current verification schemes for warnings within their national met services, with best examples to be put forward to represent RA-VI.

LIST OF PARTICIPANTS

Mr Dave Robinson (Chair)	Met Office (UK)
Ms Haleh Kootval	WMO Secretariat
Dr Herbert Gmoser	ZAMG (Austria)
Mr Jan Sulan	CHMI (Czech Republic)
Ms Hannele Kaija	FMI (Finland)
Mr Markku Seppanen	FMI (Finland)
Mr Axel Thomalla	DWD (Germany)
Mr Tor Skaslien	Met.no (Norway)
Dr Aurora Stan-Sion	NMA (Romania)
Mr Alexcy Lyakhov	Hydrometeorological Bureau of Moscow and Region (Russian Federation)
Mr Ali Price	Met Office (UK)