

13 DECEMBER 2000 : AN OPEN DISCUSSION MEETING - EXTREME RAINFALL

In association with the British Hydrological Society

Mr G Monk, Impact Weather Services - Types of extreme rainfall events and the challenges in predicting them - a bench forecaster's perspective

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This autumn has been labelled the wettest on record. The major events will be discussed in terms of their type and how well they were forecast, ranging from the synoptic setting and medium term forecasts, to monitoring and nowcasting as events unfolded. Particular focus will be given to the period 29th to 31st October.

Dr A Illingworth, University of Reading - Challenges in measuring extreme rainfall over small areas

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A review will be presented of the spatial and temporal characteristics of storms producing extreme rainfall likely to produce flash floods and discussed in terms of the capability of the current UK radar network. An alternative scanning strategy will be proposed. The effect of hail and attenuation on rainfall estimates will be described and a means of alleviating these difficulties using polarisation techniques will be presented. In continental Europe the suggestion of networks of cheap high-resolution advanced polarisation X-band radars has recently been revived; the performance of such systems will be analysed.

Dr B Golding, The Met. Office - The challenge of combining mesoscale observations and a mesoscale model to predict heavy rainfall in the 0 - 12 hour range

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The presentation will approach this challenge from two viewpoints. The first is improvement of the performance of mesoscale models through data assimilation and will be addressed with particular emphasis on techniques for incorporating radar information. The second is extension of the validity of observational information into the future through nowcasting. The use of mesoscale model output to improve this process will be illustrated using examples from the Met. Office's Nimrod system. Results will be presented both for specific cases which occurred during the past year, and using routine evaluation statistics.

Mr K Mylne, The Met. Office - Can ensembles forecast the probability of extreme rainfall events?

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One of the hopes of ensemble prediction is that it can predict the probability of extreme weather. This presentation will discuss the behaviour which should be expected from an ensemble system, and show that normally it may be unreasonable to expect to be able to

predict high probabilities of extremes. This then raises the question of how to make use of probability forecasts when the probabilities of events are low; some strategies for users will be described. The Met. Office is currently developing a system to attempt to issue probabilistic warnings of severe weather several days in advance, using the ECMWF ensemble. Due to its localised nature and the strong influence of non-linearities on short time and length scales, rainfall prediction is more difficult than some other weather parameters. Examples will be shown from the storms of Oct/Nov 2000 showing that on these occasions predictability of severe weather was remarkably high, and that good early warning was available from ensembles,

Professor T Choularton, UMIST - The effects of orography on extreme rainfall

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The main emphasis of this talk will be the influence of cloud microphysics on the events.

Two main effects will be discussed. The first is the seeder-feeder effect where prolonged frontal rainfall experiences substantial low level enhancement for prolonged periods of heavy precipitation. The second type of event will be convective precipitation initiated by a mountain and tied to the elevated region where the cloud microphysics affects the amount, timing and distribution of the precipitation.

Dr H Volkert, DLR, Germany - Severe rainfall events in the alpine region - current measuring and simulation capabilities

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The final presentation shifts the emphasis to the Alpine region of mainland Europe. It highlights and summarises recent activities within international projects such as HERA (Heavy Precipitation in the Alpine region; EU funded; 1996-99) and MAP-SOP 1999 (Mesoscale Alpine Programme - Special Observing Period; 7 Sept - 15 Nov 1999). This includes Alpine-wide radar composites, airborne Doppler-radar measurements, multi-radar observations in the Lago Maggiore area as well as high resolution ($D_x < 10$ km), non-hydrostatic modelling in forecast and hindcast mode including advanced microphysical schemes. Finally, the relevance of precise precipitation forecasts for increasing the lead-time of reliable hydrological warning procedures is touched upon