



Evaluation of an ensemble based medium range probabilistic flood forecasting system for the Upper Danube catchment

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Within the EU Project PREVIEW (Prevention, Information and Early Warning) various weather forecast products from ECMWF, DWD, ARPA-SIM and IMK will be compared. Based on this system of meteorological forecasts ensembles of discharge series have been generated for the hydrological year 2002 for the Danube catchment upstream Bratislava. The main objective is to derive performance criteria not only for flood events (like the flood event of August 2002), but also to evaluate the technical quality of the different forecasting systems continuously within the year. In order to evaluate the resulting ensemble of discharge series the following methodologies will be applied: 1. One possibility to assess the probabilistic forecast quality statistically correct is to apply tests based on probability integral transform (BIT), which consists in evaluating the cumulative distribution function of the predictions in correspondence to the observed values (*Berkowitz 2001*). 2. In order to combine the predictive distributions from different forecast systems the method of Bayesian Model Averaging (BMA) will be applied (*Raftery et al, 2005*). The BMA predictive probability density function (PDF) of any future weather and/or hydrological quantity of interest is a weighted average of PDFs centered on the bias-corrected forecast from a set of different models. The weights assigned to each model are posterior probabilities and reflect that model's contribution to the forecasting skill over a training period. Weights must be applied to the ensemble members, which can be equal if all members are assumed equally likely to occur, or unequal if not. 3. For the modelling of the probabilities in the tails of the distribution, outside the ensemble, extreme value distributions, such as the Generalized Pareto distribution, could be fitted. First results of these evaluation methods will be shown and difficulties will be discussed.