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Total probabilities in an operational flood warning system

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The European Flood Awareness System is an operational service which is monitoring and forecasting floods across Europe, and even includes some smaller areas in Asia and Africa. A range of meteorological forecasts from different produces is used as input to the hydrological model, both deterministic (ECMWF, DWD) and ensembles (ECMWF and COSMO-LEPS). Ensemble forecasts are used to represent the uncertainty of the forecasts, but reality has shown that these are in most cases both biased and wrongly dispersed (variability of output does not reflect the real uncertainty). Currently the model output from the different ensembles are presented and analyzed separately, but we are planning to replace these with post-processed means and uncertainty, estimated from all forecasts.

The method will be used to produce post-processed total probabilities for all pixels in the distributed (5x5 km resolution), continental scale model. The number of calibration stations (around 700) and the need to regionalize the results mean that we need to change slightly approaches that have previously been tested for hydrological post-processing. We will also discuss the necessary compromises for implementation in an operational model, for example that limitation of the possibility of extreme errors can be as important as using the best possible calibration.