

**Valuable Uncertainty - probabilistic flood forecasting with EFAS in the Elbe and Danube**

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Abstract:

The European Flood Alert System (EFAS) is designed as a flood early warning system at pan-European scale to complement National systems with medium-range, probabilistic flood forecast information. It incorporates deterministic and ensemble weather forecasts from the German Weather Service, the European Centre for Medium-Range Weather Forecast, and the COSMO-LEPS consortium. Based on these 120 forecasts daily, EFAS produces probabilistic flood forecast information that is disseminated to the EFAS partner network, comprising 24 National hydrological authorities responsible for transnational river basins. On average 20-30 flood alerts per year are sent out. Results show that with current technology flood warning time up to 10 days could have been achieved during the snowmelt-driven Elbe 2006 flood. During rainfall driven floods lead times are typically of the order of 4-6 days. Much effort is undertaken to transform the raw ensemble flood forecasts into reliable and skilful flood probabilities. This estimate of the conditional probability distribution of the discharge in the next days is calculated for individual stations where model predictions and real-time discharge observations are available. Examples of long-term study of skill scores are presented, indicating that over the past 10 years the skill in flood forecasting has continuously improved.

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