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The European Flood Alert System – Part 1: Concept and development

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Abstract. This paper presents the development of the European Flood Alert System (EFAS), which aims at increasing preparedness for floods in trans-national European river basins by providing local water authorities with medium-range and probabilistic flood forecasting information 3 to 10 days in advance. The EFAS research project started in 2003 with the development of a prototype at the European Commission Joint Research Centre (JRC), in close collaboration with the national hydrological and meteorological services. The prototype covers the whole of Europe on a 5 km grid. In parallel, different high-resolution data sets have been collected for the Elbe and Danube river basins, allowing the potential of the system under optimum conditions and on a higher resolution to be assessed. Flood warning lead-times of 3– 10 days are achieved through the incorporation of medium-range weather forecasts from the German Weather Service (DWD) and the European Centre for Medium-Range Weather Forecasts (ECMWF), comprising a full set of 51 probabilistic forecasts from the Ensemble Prediction System (EPS) provided by ECMWF. The ensemble of different hydrographs is analysed and combined to produce early flood warning information, which is disseminated to the hydrological services that have agreed to participate in the development of the system. In Part 1 of this paper, the scientific approach adopted in the development of the system is presented. The rationale of the project, the system's set-up, its underlying components, basic principles and products are described. In Part 2, results of a detailed statistical analysis of the performance of the system are shown, with regard to both probabilistic and deterministic forecasts.

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