



Communication of uncertainty in flood forecasting and warning to end users: case study on the European flood alert system

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The European Flood Alert System (EFAS) is an initiative of the Joint Research Center of the European Commission to complement Member States' activities in flood forecasting. EFAS provides medium-term forecasts (3 to 10 days in advance) in transnational European river basins. When EFAS forecasts discharges to exceed high or severe alert levels, information reports on the possibility of flooding are issued to the Member States' hydrological services having signed a Memorandum of Understanding. Based on EFAS information and on their own short-term local forecasting, Member States' forecasters usually have to decide whether or not a flood warning has to be issued to initiate an emergency procedure. Currently, very few national hydrological services deal with probabilistic forecasting techniques. In fact, they usually use deterministic forecasts to support their decisions. In the deterministic approach, only one estimate of the most probable future state is available. However, it is well known that forecasts should also provide an estimate of the uncertainty due to other possible outcomes in order to improve forecast accuracy and value. Recently, EFAS has taken a step forward in implementing probabilistic prediction. Uncertainty from meteorological forecasts has been incorporated in EFAS flood forecasts and tools were developed to visualize this uncertainty with regard to flood alert levels. EFAS main concerns are: 1) are the implemented tools extracting the necessary information? 2) How to best communicate the uncertainty in EFAS flood warnings to its users? In this study, we present the first steps taken to address these issues. We present the results

of a workshop organized to explore together with Member States' forecasters how to deal with uncertainty in operational flood forecasting and decision making. 11 participants were invited from 8 different countries, resulting in a group of forecasters with a wide range of experience and different cultural backgrounds on the perception and communication of uncertainty. The methodology adopted was based on the analysis of three case studies by individual workgroups. Each case study corresponded to a flood forecasting situation, for which the workgroups had to decide whether or not they would contact the civil protection authorities with a flood warning. Additionally, two anonymous questionnaires were prepared: an entry questionnaire aimed to assess the background of the participants and an exit questionnaire addressing their general perceptions of uncertainty and of the best way to communicate uncertainty in flood forecasting. From the workshop, some important aspects emerged concerning the practice in flood forecasting and the way forecasters perceive uncertainty.