



A transition to probabilistic hydro-meteorological forecasts for operational flood incident response in England

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The Environment Agency (EA) is the lead authority for flooding from rivers and the sea in England. The EA has an overview of flooding from all sources, and works with local authorities to provide them support in responding to surface water flooding. The EA receives operational hydro-meteorological forecasting products from the Flood Forecasting Centre (a partnership between the EA and the UK Met Office), which are used to produce two deterministic flood scenarios; a best estimate and a reasonable worse case.

As the EA's long-term plan is to move to full probabilistic forecasts, they would like to understand how a transition from deterministic forecasting might affect their flood incident management activities and decision-making. A series of interviews were carried out with "monitoring and forecasting duty officers" and "flood warning duty officers" from several EA centres. These two roles were selected as they jointly form the first line of forecast-led decision-makers in the EA's decision-making chain.

Through these interviews, it became apparent that the forecast is only a small part of the information used by the EA duty officers for decision-making. Other sources of information include: model performance, local knowledge and experience, and external considerations (such as public response and the availability of resources). However, the duty officers highlighted ways in which they currently communicate uncertainty, suggesting that there is a space for the communication of confidence associated with probabilistic forecasts at the EA and externally. The EA duty officers expressed mixed personal opinions on the opportunities and challenges of a transition to probabilistic flood forecasts. These ranged from less optimistic (e.g. a few interviewees fear that this might push the uncertainty and decision down the line and onto the flood warning duty officers) to more optimistic views (e.g. a few interviewees believe that this will improve the communication of uncertainty in the long term and give them more credibility and confidence).

The impact of changes in operational forecast production on forecasters and duty managers has until now been poorly studied. In this context, this work gives valuable insights and guidelines to help a smooth transition from deterministic to probabilistic flood forecasts at the EA, as well as at other institutions facing similar transitions.