

Propagation of hydro-meteorological uncertainty in a model cascade framework to inundation prediction – REVIEW

This paper considers the propagation of uncertainty through a cascading model system, linking a Numerical Weather Prediction model with hydrological and 2D hydrodynamic models. The paper is well written and the topic will be of interest to a wide ranging audience, although I am not entirely sure what specifically this work contributes to scientific progress. This should be more clearly specified by the authors. In this resubmission, the paper has been substantially improved and the authors have addressed many of the previous reviewers' comments adequately, although I do have some questions:

The research aims to quantify uncertainty in a hindcast scenario, removing non-behavioural ensemble members at each stage based on the fit with observed data. In the first instance (NWP predictions) a Nash Sutcliffe (NS) value of >0.3 is accepted as behavioural, while the hydrographs were rejected if the score fell below 0.6. How were these limits defined? Justification should be given, particularly as the choices that are made will have a significant influence on the perceived uncertainty in the model chain.

The uncertainty in the hydrological model parameters are defined by calibrating the model to a series of past events. Some more information would be useful. For instance, what rainfall input was used during this calibration? Also, what was the advantage in defining 6 sets of parameter values from various events rather than simply using the 2009 event and accepting any parameter sets that provided hydrographs that lay within the specified threshold? This is particularly relevant as some of the calibrated NS scores were very poor (e.g. 0.155), while also the 2009 event was significantly larger than any of the others.

There is no representation of uncertainty in the hydrodynamic model. This feels like a fairly major omission given the attempt to establish a framework for quantifying uncertainty in extreme events. There are many sources of uncertainty in hydrodynamic models, and I feel the exclusion of all of them needs some further justification. Alternatively, could sensible parameter ranges be estimated using a Monte Carlo approach, rejecting parameter ranges based on NS scores as done for the other model components?

A tidal boundary is mentioned briefly in the site description, however, no further information is provided. Is this boundary condition influential to the model? How was this boundary calculated?