

## UK Environmental Prediction – integration and evaluation at the convective scale

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It has long been understood that accurate prediction and warning of the impacts of severe weather requires an integrated approach to forecasting. For example, high impact weather is typically manifested through various interactions and feedbacks between different components of the Earth System. Damaging high winds can lead to significant damage from the large waves and storm surge along coastlines. The impact of intense rainfall can be translated through saturated soils and land surface processes, high river flows and flooding inland. The substantial impacts on individuals, businesses and infrastructure of such events indicate a pressing need to understand better the value that might be delivered through more integrated environmental prediction.

To address this need, the Met Office, NERC Centre for Ecology & Hydrology and NERC National Oceanography Centre have begun to develop the foundations of a coupled high resolution probabilistic forecast system for the UK at km-scale. This links together existing model components of the atmosphere, coastal ocean, land surface and hydrology. Our initial focus has been on a 2-year Prototype project to demonstrate the UK coupled prediction concept in research mode.

This presentation will provide an update on UK environmental prediction activities. We will present the results from the initial implementation of an atmosphere-land-ocean coupled system and discuss progress and initial results from further development to integrate wave interactions. We will discuss future directions and opportunities for collaboration in environmental prediction, and the challenges to realise the potential of integrated regional coupled forecasting for improving predictions and applications.