



## **The UKC2 regional coupled prediction system**

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It is hypothesized that more accurate prediction and warning of natural hazards, such as of the impacts of severe weather through the environment, requires a more integrated approach to forecasting. This approach also delivers research benefits through providing tools with which to explore the known interactions and feedbacks between different physical and biogeochemical components of the environment across sky, sea and land.

This hypothesis is being tested in a UK regional context at km-scale through the UK Environmental Prediction Project. This presentation will provide an introduction to the UKC2 UK Environmental Prediction research system. This incorporates models of the atmosphere (Met Office Unified Model), land surface (JULES), shelf-sea ocean (NEMO) and ocean waves (WAVEWATCH III). These components are coupled (via OASIS3-MCT libraries) at unprecedentedly high resolution across the UK and the wider north-west European regional domain. A research framework has been established to explore the representation of feedback processes in coupled and uncoupled modes, providing a unique new research tool for UK environmental science. The presentation will highlight work undertaken to review and improve the computational cost of running these systems for efficient research application.

Research will be presented highlighting case study evaluation on the sensitivity of the ocean and surface waves to the representation of feedbacks to the atmosphere, and on the sensitivity of weather systems and boundary layer cloud development to the exchange of heat and momentum at the ocean surface modified through sea surface temperature and wave-induced roughness.

The presentation will discuss plans for future development through UKC3 and beyond.