



## **Evaluation and development of hydrological parameterisations for the atmosphere, ocean and land surface coupled model developed by the UK Environmental Prediction (UKEP) Prototype project**

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The UKEP project brings together atmosphere, ocean and land surface models and scientist to build a coupled prediction system for the UK at 1.5 km scale. JULES (Joint UK Land-Environment Simulator) is the land surface model that generates runoff and simulates soil hydrology within the coupled prediction system. Here we present an evaluation of JULES performance at producing river flow for 13 selected catchments in Great Britain, where we use daily river flow observations at the catchment outlets. The evaluation is based on the Nash-Sutcliffe metric and bias. Results suggest that the inclusion of a new linear topographic slope dependency in the  $S_0$  parameter of the PDM (Probability Distributed Model, scheme that generates saturation excess runoff at the land surface when the soil water storage reaches  $S_0$ ), improves results for all catchments, constraining the surface runoff production for flatter catchments during rainy episodes.

The new hydrological configuration developed offline using the JULES model has been implemented in the coupled prediction system for an intense winter storm case study. We found significant changes in accumulated runoff and total column soil moisture, and results consistent with the offline experiments with an increase in surface runoff on the high slopes of Scotland.