



## **Uncertainties in hydrological prediction using input ensembles from different cumulus parameterization schemes (CPSs)**

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In recent years, there has been great interest in conjunctive use of finer spatial resolution numerical weather models with hydrological models for improved stream flow modelling and management. This study attempts to evaluate the role of different cumulus parameterization schemes (CPSs) in high-resolution precipitation ensemble forecasts and its influence on hydrological simulation at the Brue catchment in the Southwest of England. This study has performed a comprehensive evaluation of precipitation data derived from four CPSs like the Anthes–Kuo, Grell, Betts–Miller and Kain–Fritsch schemes and their influence on catchment hydrology; which was assessed using a well calibrated rainfall–runoff model, the HyMOD. The study has used the data from three-dimensional Pennsylvania State University/National Center for Atmospheric Research (PSU/NCAR) mesoscale model 5 (MM5) and which was nested down to resolution of 3-km for domain 4 (domain span 16 x 3km) with vertical resolutions at 23 sigma levels. The six hourly ERA-40 data provided by the ECMWF was used to initialise the boundary conditions to the model. The study addresses uncertainties in ensemble hydrological modelling driven by downscaled variables obtained from these four CPSs for four months of the year 1995 representing the four seasonal month's viz. January (winter), March (spring), July (summer) and October (autumn). The five parameter conceptual model, HyMOD was calibrated using the HYREX ground observed data and Shuffled Complex Evolution Metropolis Algorithm (SCEM-UA).