



Conditioning model output statistics of Regional Climate Model precipitation on circulation patterns

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Dynamical downscaling of precipitation through Regional Climate Models (RCMs) potentially improves the usability of precipitation in hydrological impact studies. However, further downscaling of the variables important for local impact studies is often needed. This study analysed three Model Output Statistics (MOS) techniques to correct RCM precipitation; (1) a simple direct method (DM), (2) quantile-quantile mapping (QM) and (3) a distribution-based scaling (DBS). The modelled precipitation estimates were derived from 16 RCMs driven by ERA40 reanalysis data provided by the ENSEMBLES (ENSEMBLE-based Predictions of Climate Changes and their Impacts) project over a small catchment (~ 2000 km 2) in the Midlands in the UK. The DBS method was further conditioned on separate months, and an objective classification of Lamb's Weather pattern. The MOS techniques were validated on temporal and spatial characteristics of the precipitation fields, as well as modelled runoff using the HBV rainfall-runoff model. The results indicated that the DBS conditioned on circulation patterns performed overall better than the other methods, but also that the choice of MOS technique adds an extra layer of uncertainty to the downscaling. To further test the result, more test catchments needs to be included. Also, circulation patterns conditioned on precipitation and/or runoff will be tested