



Regional Climate Modelling: impact of horizontal grid resolution on precipitation estimates over Ireland

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Regional Climate Models (RCMs) are widely used to dynamically downscale the outputs from global climate model simulations. There is some evidence that high resolution RCMs with explicit convection can provide more accurate information on extreme precipitation events compared to coarse resolution simulations with parameterized convection. In flooding applications, where the interest may be focused on precipitation over a relatively large river catchment area, compared to the model grid spacing, the value of enhanced resolution needs to be quantified.

This is addressed in a study using two RCMs: the Consortium for Small-scale Modeling–Climate Limited-area Modelling (COSMO-CLM) model (version CCLM_5.00) and the Weather Research and Forecasting (WRF) model (version 3.7.1). Using ERA-Interim global re-analysis data as boundaries, climate simulations were performed for the period 1981-2015, for an area focused on Ireland, using model horizontal grid spacings of 18, 6 and 2 km (WRF) and 18, 6 and 1.5 km (COSMO-CLM).

Model hourly precipitation outputs were compared with gridded and point observational datasets for time intervals extending from hours to seasons to assess the performance of the RCMs at the different resolutions.