



High-resolution modelling of extreme precipitation over Ireland under different climate scenarios

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Extreme precipitation has significant impacts on water resources and river flooding. An important question is whether the climate change caused by increasing greenhouse gases will change the frequency and intensity of extreme events. To investigate the uncertainties of future projection over Ireland due to the different emission scenarios, the Rossby Centre Regional Atmosphere model (RCA) is driven by different global data sets over western Europe at a high resolution (about 13KM). For the past climate (1961-2000), in addition to the ERA40 driven simulation which help us to understand the performance of the model, two control simulations are run, driven by ECHAM4/OPYC3 and ECHAM5/OM1 data sets. For the future projection (2021-2060), the RCA model is driven by ECHAM4/OPYC3 B2 scenario data and also with ECHAM5/OM1 A2, A1B and B1 emission scenario data. The Generalized Extreme Value (GEV) method is used to calculate the return values of annual and seasonal extreme events which include 1-day, 2-day and 5-day events. Results show that there are considerable differences between the ECHAM4 and ECHAM5 driven simulations both for the past and future climate, especially in the seasonal variation of precipitation. Changes in seasonal return values are more significant than the changes in the annual return values. This may be associated with differences in the large-scale circulation patterns in the GCM scenario simulations.