



Sub- and multi-day precipitation extremes in high resolution Met Office regional climate model simulations

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As part of the United Kingdom Natural Environment Research Council-supported CONVEX project, the Met Office has completed two high-resolution (12-km parameterised convection and 1.5-km explicit convection permitting) regional climate model simulations. Extreme value theory is used as a diagnostic tool for the above two simulations. On sub-daily time scales, the 12-km simulation has weaker and more realistic typical JJA extremes than the 1.5-km RCM, yet the 12-km RCM has overly intense extreme extremes. Grid point storms are found to play a role in creating these overly intense extreme extremes. Comparisons with observations indicate that the 1.5-km RCM is more successful than the 12-km RCM in representing (multi-)hourly JJA extremes for long return periods. As accumulation periods increase toward (multi-)daily time scales, the 12-km precipitation extremes become more comparable with observations and the 1.5-km RCM. Both simulations have reasonable DJF sub- and multi-day extremes, but DJF extremes are generally weaker, so they are less interesting than JJA extremes practically. Overall, our results indicate that the usage of higher resolution explicit convection permitting models has led to some improvements in the simulations of high impact precipitation extremes.