



Development of a rainfall disaggregation scheme for climate impact studies

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Climatic scenarios from either Global Circulation Models (GCMs) or simpler analogue models are frequently used as inputs to off-line hydrological simulations in order to assess the hydrological impacts of climate change. While observed climatology and GCM (and analogue model) output is generally available on a monthly time step, most hydrological models require a daily time step or smaller. This study investigates and improves a rainfall disaggregation scheme currently used to convert monthly rainfall totals down to the daily time step. Daily rainfall data from network of raingauges covering the Nile basin is used to assess the performance of the model and the results are contrasted with data from a relatively dense raingauge network from the Blackwater Catchment, in the Southeast of the UK. The scheme preserves the mean properties of rainfall occurrence and amount; however, there is significant overestimation of variability. Regional calibration and better formulation improve simulation of variability as well as other aspects of rainfall properties. The study investigates the dependence of rainfall properties on spatial scale in an attempt to establish relationships enabling the transfer of data from one spatial scale to another. The framework is completed with a model to estimate the wet fraction from monthly total rainfall when the former is not available.