



Spatial-temporal daily rainfall simulation in a semi-arid area using Generalised Linear Models: A case study from northeast Iran

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In this paper, the potential of a Generalised Linear Model (GLM)-based model to analyse and model daily rainfall in a semi-arid region in northeast Iran is evaluated. The study indicated that while temporal predictors are important in modelling rainfall occurrence, spatial predictors are more influential in the amounts model. Unlike humid climates, effects of temporal memory are limited to the previous day's rainfall. The rainfall data were found to follow a cyclical trend with a period of around 5.5 years, mainly a result of spring rainfall periodicity. Teleconnection indices including El Niño-Southern Oscillation were not found significant in the modelling, and did not account for the inter-annual periodicity. The modelling results indicate that rainfall properties including extremes are generally well captured by the models, particularly if spatial dependence effects are included. Although the annual maximum daily rainfall tends to be overestimated at a few sites, performance is generally satisfactory at more than 75% of sites.