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Discussions

Interactive comment on "Assessment of statistical characteristics of point rainfall in the Onkaparinga catchment in South Australia" *by* M. M. Rashid et al.

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Response to reviewer comments: Reviewer #1 (A. Seed)

We thank the Reviewer #1 for highlighting some important references that are directly related to our study. In particular, Jakob et al. (2011a) and Jakob et al. (2011b) are very important since our study has focused on the Australian rainfall. We have included these references in the revised manuscript.

In this study we only modelled the daily rainfall amount for the observed wet days using the gamma, exponential, Weibull and hybrid distributions. Daily rainfall modelling

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generally follows a two step approach. First, the occurrence of rainfall in any day is identified and second, the rainfall amount is modelled for that day. With reference to the errors involved in the amount model, this is largely influenced by the occurrence model, which results in bias in the modelled values as compared to the observed values. For example, if the occurrence model identifies a day as a dry day although it is a wet day in the observed data, the amount model does not model rainfall on that day. Sometimes the amount model generates rainfall in a day which is dry in the observed data and vice versa due to the limitation of the occurrence model. Therefore we only considered modelling rainfall amounts in observed rainy days. In order to assess the performance of the model in terms of reproducing different rainfall statistics, we have estimated the rainfall for every observed wet day using the probability distribution. A day is considered as wet day if it has a daily rainfall amount greater than 0.5 mm. For any wet day, the estimated model parameters have been used to generate the rainfall for that day using the particular probability distribution model. In this way the amount model is kept independent of the influence of the occurrence model so that the performance of the distribution model can be examined separately.

We agree with the reviewer that the distribution parameters might be different for different seasons (summer and winter). In this particular study we did not fit different distributions for different seasons in order to keep the model simple and constant over the years and to see how the model performs. The study focused on the performance evaluation of the hybrid model in comparison to other commonly used models. However, it was observed in the study that the model reproduced the seasonal variations reasonably well (Figure 9).

Additional references:

Jakob D., Karoly D. and Seed A.: Non-stationarity in daily and sub-daily intense rainfall–Part 1: Sydney, Australia, Natural Hazards and Earth System Science, 11, 2263-2271, 2011a.

Jakob D., Karoly D. and Seed A.: Non-stationarity in daily and sub-daily intense rainfall–part 2: Regional assessment for sites in south-east Australia, Natural Hazards and Earth System Science, 11, 2273-2284, 2011b.

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