Hydrology and
Earth System
Sciences

Discussions

Open Access

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

A. Seed (Referee)

a.seed@bom.gov.au

General Comments

The paper evaluates the probability distribution for daily rain gauge rainfall using a 50-year data set for 13 rain gauges in South Australia and concludes that a hybrid distribution of gamma and generalised pareto distributions is able fit the observed distributions. I have the following general comments regarding the paper:

Literature Review

The literature review in the Introduction is incomplete as it makes no mention of the

C2373

considerable body of literature on the scaling properties of rainfall, eg

Ceresetti, D., G. Molinie, and J-D Creutin, 2010. Scaling properties of heavy rainfall at short duration: A regional analysis. Water Resour. Res., 46, W09531, doi:10.1029/2009WR008603, 2010

that addresses the modelling of the tails of the distributions directly.

Also, the review of the Australian literature on the probability distribution of daily rainfall should include the Jakob et al (2011) papers:

Jakob. D., Karoly, D.J., and A.W. Seed, 2011. Non-stationarity in daily and sub-daily intense rainfall – Part 1: Sydney, Australia. Nat. Hazards Earth Syst. Sci., 11, 2263 -2271, doi 10.5194/nhess-11-2263-2011.

Jakob, D., D.J. Karoly, and A.W. Seed, 2011. Non-stationarity in daily and sub-daily intense rainfall – Part 2: Regional assessment for sites in south-east Australia. Nat. Hazards Earth Syst. Sci., 11, 2273-2284, doi:10.5194/nhess-11-2273-2011.

since they address many of the same issues.

Daily rainfall generation.

The stated aim of the paper was to evaluate the statistical characteristics of daily rain gauge observations and to identify the probability distribution that provides the best fit. However, the authors then use the probability distribution to generate a time series of daily rainfall which raises the following issues:

1. A process to generate the series of rain/ no rain days is needed if only the wet days are modelled, how was this done?

2. How was the serial correlation modelled for daily rainfall?

3. The distribution parameters of daily rainfall are very likely to vary with season. Summer is usually associated with convective rain and winter in that region is probably

widespread orographic rainfall. Therefore I would expect that the distribution of daily rainfall is quite different for the two seasons and that this would have to be modelled explicitly.