

Interactive comment on “Effects of intersite dependence of nested catchment structures on probabilistic regional envelope curves” by B. Guse et al.

Anonymous Referee #2

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The paper deals with regional flood frequency analysis, in particular the effects of intersite correlation in the presence of nested catchments, using the Probabilistic Regional Envelope Curve (PREC) method. Because this method requires a high degree of homogeneity, the paper also maintains a strong focus on the effects of different degrees of heterogeneity. Thus, the paper appears less focused than what could be expected.

In their literature review the authors claim that “only little guidance is given on the effects of intersite correlation in estimating regional quantiles”. Several papers, however, have addressed this topic in detail, e.g. Madsen and Rosbjerg (1997a,b) in a partial duration series context, and Kjeldsen and Rosbjerg (2002), Kjeldsen and Jones (2006), and

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Rosbjerg (2007) in an annual maximum series context.

Is the use of the Hazen plotting position (PP) an essential part the PREC method? If so, it is not well explained. If not, why is it chosen? Usually it is not an optimal choice.

The structure of the paper could be improved by keeping theory and its application in the study area better apart and, as indicated above, maintaining a stronger focus on the main objective. It should be considered if all the figures really are necessary.

The present HESSD paper needs substantial reworking before it can be upgraded to HESS.

References:

Kjeldsen, T. R. and Rosbjerg, D. (2002) Comparison of regional index flood estimation procedures based on the extreme value type I distribution, *Stoch. Env. Res. Risk A.* 16(5), 358-373.

Kjeldsen, T. R. and Jones, D. A. (2006) Prediction uncertainty in a median based index flood method using L-moments, *Water Resour. Res.* 42, W07414, doi:10.1029/2005WR004069.

Madsen, H. and Rosbjerg, D. (1997a) The partial duration series method in regional index-flood modelling, *Water Resour. Res.* 33(4), 737-746.

Madsen, H. and Rosbjerg, D. (1997) Generalized least squares and empirical Bayes estimation in regional partial duration series index-flood modelling, *Water Resour. Res.* 33(4), 771-781.

Rosbjerg, D. (2007) Regional flood frequency analysis, *Extreme Hydrological Events: New Concepts for Security* (eds. O. F. Vasiliev, P. H. A. J. M. van Gelder, E. J. Plate and M. V. Bolgov), NATO Science Series IV: Earth and Environmental Sciences, Vol. 78, 151-171.