



## Reliability of Probabilistic Regional Envelope Curves

B. Guse (1,2), A. H. Thielen (1,3), A. Castellarin (4), and B. Merz (1)

(1) Helmholtz Centre Potsdam, GFZ - German Research Centre for Geosciences, Section Engineering Hydrology, Potsdam, Germany (bguse@gfz-potsdam.de), (2) Center for Disaster Management and Risk Reduction Technology (CEDIM), Germany, (3) alpS, Centre of Natural Hazard and Risk Management, University of Innsbruck, A-6020 Austria, (4) DISTART, University of Bologna, Bologna, Italy

The estimation of flood quantiles is a crucial point in flood risk analysis and in the calculation of a design flood. In this context, the method of Probabilistic Regional Envelope Curves (PRECs) has enhanced the traditional method of envelope curves by assigning a recurrence interval to a REC (Castellarin et al., 2005). In this study, PRECs were derived for Saxony/Germany using 89 gauges.

In order to estimate the reliability of PREC results, PRECs were derived for several pooling groups using two different pooling methods (cluster analysis, Region of Influence) and behavioural subsets of catchment descriptors. Each pooling group was checked for homogeneity by the heterogeneity measure. Next, a PREC was calculated for each pooling group. By a leave-one-out jack-knifing approach, the reliability of PREC results for ungauged catchments (PREC-JK) was compared with a traditional index flood approach.

The sensitivity analysis of PREC points out that the results of PREC vary in discharge as well as in recurrence interval. A comparison of both pooling methods gives a similar reliability of the PREC results. An overall performance index affirms that mean as well as standard deviation of the relative error of PREC-JK are increasing for higher thresholds of the heterogeneity measure.

Castellarin, A., R. M. Vogel, and N. C. Matalas (2005), Probabilistic behaviour of a regional envelope curve, *Water Resour. Res.*, 41, W06018, doi: 10.1029/2004WR003042.