A C T A G E O P H Y S I C A P O L O N I C A

Vol. 53, no. 4, pp. 437-457 2005

ARE PARSIMONIOUS FF MODELS MORE RELIABLE THAN TRUE ONES? II. COMPARATIVE ASSESSMENT OF THE PERFORMANCE OF SIMPLE MODELS VERSUS THE PARENT DISTRIBUTIONS

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A b s t r a c t

Applying the methodology described in Strupczewski *et al*. (2005a; this issue), the performance of various parsimonious models combined with three estimation methods *versus* Flood Parent Distributions is comparatively assessed by simulation experiments. Moments (MOM), *L*-moments (LMM) and maximum likelihood (MLM) are used as alternative methods. Five four-parameter Specific Wakeby Distributions (SWaD) are employed to serve as Flood Parent Distributions and forty Distribution/Estimation (D/E) procedures are included in respect to the estimation of upper quantiles. The relative bias (*RB*), relative root mean square error (*RRMSE*) and reliability of procedures are used for the assessment of the relative performance of alternative procedures.

Parsimonious two-parameter models generally perform better for hydrological sample sizes than their three-parameter counterparts with respect to *RRMSE*. However, the best performing procedures differ for various SWaDs.

As far as estimation methods are concerned, MOM usually produces the smallest values of both *RB* and *RRMSE* of upper quantiles for all competing methods. The second place in rank is occupied by LMM, whereas, MLM produces usu-

ally the highest values. Considerable influence of sampling bias on the value of the total bias has been ascertained.

The improper choice of a model fitted to SWaD samples causes that the reliability of some three-parameter parsimonious D/E procedures does not always rise with the sample size. Also odd is that *True* model does not always give one hundred percent reliability for very large samples, as it should. This means that estimating algorithms still require improvements.

Key words: flood frequency analysis, Monte Carlo, probability distribution, estimation methods, quantiles, bias.