



Extreme-oriented selection and fitting of probability distributions

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Fitting of theoretical probability distributions to hydrological variables are as imperfect as any model fit to reality. The differences among various models and their discrepancies from reality may be negligible if we are interested about regular events falling in the body of the distribution, but may become substantial for extreme events belonging to the distribution tails. Therefore, the task of selecting and fitting a probability distribution to data becomes more sensitive and demanding when we are interested about extremes and, in particular, when we seek estimates of extremes beyond the observation horizon. The newly introduced concept of knowable (K-) moments, which is also related to order statistics, helps put focus on extremes when fitting probability distributions, simultaneously providing unbiased estimators for moments of order however high in uncorrelated data, or control the estimation bias in data from autocorrelated processes. Both theoretical aspects of extreme-oriented probabilistic modelling and empirical findings from several data sets are reviewed.