

## ***Interactive comment on “On accuracy of upper quantiles estimation” by I. Markiewicz et al.***

**Anonymous Referee #1**

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The paper presents some Monte-Carlo experiments that show how bias and efficiency of estimation of the 100% quantile ( $q_{100}$ ) with different parameter-estimation methods vary for varying parent distributions and sample sizes. In particular, the authors also consider the case where the assumed parent distribution is wrong. This is a major problem in hydrology where the true parent distribution is always unknown and upper quantiles are estimated from short data samples. The analysis shows that the properties of the estimation methods vary considerably when the assumed parent distribution is the wrong one and one best method cannot be found. Among the considered techniques, the maximum likelihood method is the most sensitive to the misspecification of the parent distribution and should be used with caution when, as it is usual in hydrology, relatively short samples are available. The results in this paper are partial because, of course, only some cases of misspecification of the parent distribution are considered.

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Therefore general conclusions cannot be drawn. Anyway the paper gives some illustrative examples of how much the estimated  $q_{100}$  can be wrong, even when a "wrong but similar" parent distribution function is assumed.

I appreciated the fact that the paper is synthetic, well organised and well written. Some minor comments follow.

page 4762, lines 24-26: the subject of the paper, to me, does not relate to Flood Forecasting.

page 4765, line 17: what does "accounting difficulties" mean?

page 4766, line 7: the sentence "while the lower bound parameter  $x_i$  serves as the third one" is not clear. I would write "where in the three-parameter distributions the third parameter  $x_i$  serves as lower bound" or something like that.

Tables 3-10: Just a suggestion: it would be useful for the reader to underline the best values of RMSE and B on each row, for example using a bold font.

Page 4768, lines 24-27: how do you see in Table 4 that the bias (of estimation) of the standard deviation decreases slowly for increasing sample size?

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 4761, 2010.