

HESS 2011_113

Title: *Influence of soil parameters on the skewness coefficient of the annual maximum flood peaks*

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GENERAL COMMENT

The paper is part of a continuous effort to derive the Flood Frequency Distribution. In these series of papers the theoretically derived distribution of flood peak annual maxima TCIF (Gioia et al. 2008) is used. The TCIF is based on the assumption of two different threshold mechanisms. The first mechanism applies to ordinary floods when the rainfall intensity exceeds a threshold infiltration rate in a small source area. The second mechanism applies to extraordinary (outlier) floods when severe rainfalls exceed a soil storage threshold over a large portion of the basin. In this paper, a sensitivity analysis has been performed in order to find the effect of climatic and geomorphologic parameters, mainly of soil infiltration and soil storage capacity on the skewness coefficient of FFD using TCIF.

The paper is, in general, well organized and written but there are a few points that should be clarified and addressed. I think that addressing these points will help the reader and strengthen the paper. Overall, the paper merits publication in the HESS after the comments are properly addressed.

SPECIFIC COMMENTS

- 1) The title of the paper should be changed to indicate the main parameters investigated and that the analysis is based on the TCIF model, holding all the assumptions and hypotheses. I suggest that the title of the paper should be changed to: "Influence of soil infiltration and soil storage capacity on the skewness coefficient of the annual maximum flood peaks using the TCIF model".
- 2) The authors should spell out the acronym TCIF model at least once in the beginning of the paper. This will help the reader of the paper.
- 3) The derived CDF (Eq. 4) should be the product of the two CDFs of L- and H-type events and not the addition of those. Please correct.
- 4) The authors, correctly, present the TCIF model. However, there are too many symbols and it is difficult for the reader to follow them. I suggest to the authors to put a list of all symbols (with their explanation) used in the paper. For some of them there is no explanation at all in the paper, eg. Λ_p .
- 5) On page 5 line 14 and elsewhere later in the paper is written "Assuming the rainfall intensity is Gumbel distributed..." But on page 4 line 24 is written "The rainfall intensity is considered Weibull distributed..." Please correct.
- 6) The authors use a very large number of tables and figures to present their results. However, some of them are repetition of others. For example, the information conveyed by Tables 5 to 9 is also graphically shown in Figures 1 to 10 and the results presented on Table 10 are reproduced on Figure 12. I prefer the analytical information conveyed by the tables. The authors may keep some of the figures in the paper for specific cases (not all the cases presented on the tables) for illustration purposes. However, Figures 11 and 12 and Table 11 are redundant and convey no additional information.
- 7) The authors use interchangeably the terms soil infiltration and permeability. They should use the term soil infiltration.

MINOR TECHNICAL COMMENTS

1. In many pages of the paper the specific figures and tables should be denoted as Figures and Tables. (e.g. page 6 line 28, it should be Table 1 instead of table 1).
2. Page 7 line 2. It should be written eqs. 6 and 7 instead of eq.s. 6 and 7
3. On Table 1, the two cases $i > \varphi$ and $i > \varphi + W_A$ should be put on the headers of table columns.
4. On Tables 5-9, the caption of the tables should be written as “Mean and standard deviation of skewness coefficient ...”
5. Page 11 line 32. “...this figures...” should be corrected to “...these figures..”
6. Page 12 line 1. “...this figures...” should be corrected to “...these figures..”
7. The reference Loukas, 2002 is cited two times on the reference list.