

Interactive comment on “Evaluation of precipitation extremes and floods and comparison between their temporal distributions” by M. Müller et al.

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The first main comment concerns the used peak discharge data when computing the flood extremity index (FEI). We recognize that our expression “slightly inaccurate results” could be misinterpreted for the following reasons:

1/ It is obvious that regulation processes can significantly affect the observed flow; nevertheless, the bigger the flood is, the smaller is the capability of human to reduce it. A classical study from the Czech Republic by Buchtele (1972) demonstrates that the human influence becomes negligible by peak flows with the return period of 20 years or

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more. An extreme example was the peak discharge of about 5000 m³s⁻¹ of the Vltava River on 14 August 2002 in Prague which is considered to be completely unaffected (e.g., Brázdil et al., 2005).

2/ The explanation of discrepancies between the WEI and the FEI by the antecedent saturation partly works also for affected discharges: after a dry period, the regulation of peak flows is usually more effective.

3/ The expression “slightly inaccurate results” was not related to discharge magnitudes but to values of the FEI; the index is very robust with respect to the uncertainty of return period estimates – it works with their logarithms. Anyway, we have removed the expression and substituted it by the following statement: “so the value of the FEI represents the actual course of the flood instead of the theoretical one”. This fact has been also stressed in the discussion of the relationship between the presented indices. We accept that unregulated and natural flow data would be optimal for our study – unfortunately, it does not exist. The only exception is the above mentioned estimation of unaffected peak flows of the Vltava River in Prague by Brázdil et al. (2005). Regarding the 1983 event, this study confirms that not even unaffected peak flow with the return period of two or more years occurred in Prague even though the catchment belonged to the most affected by heavy rains.

The other main comment is why we do not use the ETCCDI indices for evaluation of precipitation extremes instead of defining new indices. The reason is that the ETCCDI indices are designed for climatological analysis of individual data series, not for evaluation of weather events within a region. However, the extremity of a flood is due to not only a maximum precipitation amount at only one station. This motivation has been even more emphasized in the text. Anyway, the WEI had been already published in its general form in NHESS (Müller and Kašpar, 2014).

We accept that the topic of the paper was not clear enough and the abstract was not correctly written. Also with respect to the other referee’s comment, we have sub-

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stantially changed both the title and the abstract. The number of acronyms has been reduced in the abstract. Information about the studied region has been added into the title with respect to your comment.

Minor comments:

- “Warmer half-years”: the expression has been replaced by the acronym “MJJASO”.
- Figure 3: The following sentence has been added into the figure caption: “Individual points represent the values of the mean, standard deviation, and skewness, calculated for each calendar day taking into account the period of 1961–2010.”
- Page 288, Line 28: The sentence has been changed and a new reference has been added: “We use the Gaussian filter because it is considered the ideal time domain filter (Blinchikoff and Zverev, 2001).” The original reference is now not necessary and has been removed.

Thank you for helping us to improve our paper!

Miloslav Müller and coauthors

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/12/C1574/2015/hessd-12-C1574-2015-supplement.pdf>

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