

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

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Received and published: 17 May 2015

The first main comment concerns specification of the purpose of our paper. Originally, we wanted to deal with both mentioned topics because of the linkage between them. Anyway, we have changed the title as well as the text to stress the purpose of the definition (and application) of the three indices. In fact, the weather extremity index (WEI) has been already published including its theoretical background (Müller and Kašpar, 2014) but only in a general sense (for any meteorological variable). In the presented paper, we have used the WEI for evaluation of precipitation events.

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Regarding unclear expressions, we have improved the text in accordance with your comment, thank you for all your suggestions. Namely:

- “Analogous”: the abstract has been changed significantly so that the word no more appears there.
- “Extremity”: the introduction has been changed with respect to the third minor comment which also deals with this term.
- “Return periods at individual sites”: the paragraph has been changed as follows: “We proposed three analogous extremity indices that enable to compare the temporal distribution of precipitation extremes and floods. The indices are based on point return period estimates of precipitation totals and peak flows, respectively, spatial averaging of their values, and optimizing the areal extent and the duration of individual events.”
- “More promising concept of intensity”: the sentence has been substantially rephrased as follows: “The concept of intensity better corresponds to physical causes; thus, it is more convenient for comparison between precipitation extremes and floods.”
- “Commonly accepted indices”: the sentence has been supplemented as follows: “...commonly accepted indices (Zhang et al., 2011), mainly those defined by the Expert Team on Climate Change Detection and Indices (ETCCDI).”
- “A more-inclusive concept of rarity”: the sentence has been rephrased as follows: “In order to reflect regional climatic differences, the concept of rarity is applied; extreme precipitation and floods can thus be detected in the whole studied region.”
- “Warmer half-years”: the expression has been replaced (at several places kept but explained) by the acronym “MJJASO”.

Minor comments:

- The abstract has been shortened and changed so that it summarizes general results only.

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- Line 10-11 page 283: the sentence has been replaced by the one suggested by you.
- Lines 13-15 page 283: the crucial sentence presenting concepts of extremity was implemented into the first paragraph.
- Line 24 page 283: the sentence has been substantially rephrased with respect to another your comment (see above): : “The concept of intensity better corresponds to physical causes; thus, it is more convenient for comparison between precipitation extremes and floods.”
- Line 27-28 page 284: the meaning of the sentence has been clarified: “Based on the concept of intensity, extreme events occur mainly in regions that are prone to heavy rains (in the Czech Republic, such regions are along the northern state border because of the orographic precipitation enhancement).”
- Line 24 page 285: we have decided to remove the discussed numbers from this sentence (“1 to 5 day” was replaced by “1-day to several-day”). The restriction of t up to 5 days is now presented and rationalized in the second paragraph page 287. Instead of a speculation about a flexible threshold for different regions, we have added a new sentence: “We decided to consider precipitation events from 1 to 5 days long because the thresholds correspond with two indices of precipitation extremes defined by ETCCDI (Zhang et al., 2011). Thank you for the suggestion regarding subdaily precipitation totals – we plan to search it in future but such data are rather rare before 2000.
- Line 10-11 page 288: Yes, this is a general statement.
- Line 21 – 24 page 292: The sentence has been rephrased as follows: “In contrast to the above mentioned papers, we modified the method so that vectors representing individual events were not of the same lengths but they were proportional to the WEI, WAI, or FEI.”
- Line 14-15 page 293: The sentence was redundant, we have removed it.

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- Page 294: We plan to prepare a more in depth comparison between WEI, WAI and FEI as another paper which will also discuss the circulation causes of the events. Nevertheless, we have reduced the site-specific results in section 3 with respect to your recommendation.
- Figure 6: In fact, the figure originated from a table. Nevertheless, the colors present additional information. That is why we hope that the final quality of the figure will be high enough; if not, we are ready to transform the figure into a table.

Thank you once again 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/C1570/2015/hessd-12-C1570-2015-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 281, 2015.

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