Natural Hazards
and Earth System
Sciences

Discussions

Interactive comment on "Event-adjusted evaluation of weather and climate extremes" *by* M. Müller and M. Kaspar

Anonymous Referee #2

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General Comments:

This paper introduces a new index to quantify the extremeness of intense weather events taking the example of heavy precipitation. While commonly applied return periods only refer to point measurements and neglect the spatial extent of an event, the presented approach combines both characteristics and leads to an interesting new measure to quantify the hydrometeorological severity of precipitation events.

The paper is well structured starting with an ample overview of established methods in quantifying extreme weather events citing relevant literature. The proposed index is explained in sufficient detail and applied to two different precipitation events.

However, the results for the two weather events studied in this work are only barely

discussed in a hydrometeorological sense (mathematically they are!). I miss a more 'applied' view on the results for the test cases including a critical comparison to the alternative methods as well as to the observed severity and damage of the storms. The key questions are: Are the derived WEI values reasonable? What is the added value of this new index?

Overall, the manuscript is of good scientific significance and presentation quality. Provided, that the discussion of the results is being extended, the scientific quality is also rated good.

Specific Comments:

'Extremity' is not the right word in this context. Please use 'extremeness' throughout the manuscript instead.

Page 4482, Line 7ff: (iii) is difficult to understand, especially regarding the considered area, without having read the paper beforehand. I suggest reformulating this part and adding one more sentence to clarify this point.

Page 4493, Eq. (1): The geometric mean is defined by the n-th root with n being the number of grid points. You can't use a, although it has the same absolute value, because it has the dimension km2.

Page 4493, Eq. (2): As a consequence, the 'a' in the denominator has to be replaced by 'n'.

Page 4493, Line 25: "It follows from Eq. (2). . ." is a bit misleading. Indeed, you use this mathematical theorem to derive Eq. (2) from Eq. (1). I suggest reformulating the sentence.

Page 4494, Line 22ff: Using daily totals for quantifying extreme convective events leads to a significant underestimation of the WEI. Do you have any idea, how to overcome this problem?

Pages 4507 and -8, Fig. 5 and 6: May you explain, why the maximum of the yellow/red curves in Fig. 6 is that much shifted to larger areas compared to the area, where the decrease of the curves in Fig. 5 starts to strengthen?

Technical Corrections:

As I'm not a native speaker, you may regard some of the following remarks as suggestions:

Page 4486, Line 25: "one of the methodological issues"

Page 4487, Line 3: "durations of events"

Page 4487, Line 22: "the limits of both the"

Page 4488, Line 13: "independent of"

Page 4490, Line 6: This must probably be Fig. 3 instead of Fig. 1.

Page 4490. Line 21: Leave out the text in brackets.

Page 4496, Line 6: "or if days"

Page 4503, Fig. 1: In my printout, the dotted lines (2+3) are not visible. It may improve using the dash-dotted linestyle.