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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Anatomy of simultaneous flood peaks at a lowland confluence" *by* Tjitske J. Geertsema et al.

Anonymous Referee #2

Received and published: 2 July 2018

I read the manuscript by Tjitske J. Geertsema et al., entitled "Anatomy of simultaneous flood peaks at a lowland confluence", with a great interest.

Authors propose to analyse the mechanisms leading to simultaneous flood event occurrence at river confluences. I think the work is interesting and represent a good contribution to the research and to the HESS journal. The manuscript is well written and structured. The reading is smooth and easy.

However, I think the manuscript needs some further developments and improvements before it can be published. Please find below some remarks that can help I hope to improve the manuscript.

Major

1. The section related to the DTW method which is central in the method is not clear enough in my opinion. I did my best but unfortunately it seems to me difficult to understand how DTW method works. As mentioned by the authors, this method has not been often applied in hydrology so I think it is important to explain it clearly. The associated figure 4 did not help me to understand the method as well. As a consequence, I warmly recommend the authors to try to reshape and rewrite this section and the associated figure so that a person that does not know how DTW works can follow it step by step.

2. The application of the DTW is not clear enough in my opinion: what are the input data used for instance?

3. The rainfall data should be better presented: are there coming from observation / interpolation? How they are used in the paper is not clear to me: as average value (or sum) over the green boxes in figure 5. I think this is important to understand the concept of time lag between the rainfall and the discharge peak.

4. There are some conclusions of the article that could have been foreseen from the beginning like for instance the influence of the rainfall distribution and the duration of the flood events over the Meuse basin. I would suggest that the authors could already elaborate rapidly on that from the introduction on. Indeed, I found the hypotheses formulated in the introduction sometimes a bit too simplistic in the current version of the manuscript.

Minor

1. Title: I am wondering if the term "anatomy" is really relevant here and then if the title is really representative form the paper?

2. P1 Line 3: Maybe "confluence" would be more appropriate than "merging of rivers".

3. P1 Line 22: "msl" could you please introduce what it stands for.

4. P2 lines 3-13: This view is a little simplistic as it is rather straightforward that the

rainfall spatial distribution is not often uniform (as shown in figure 5).

5. P2 line 24-26: This looks like a conclusion sentence already in the introduction. I would suggest to rephrase it.

6. P3 line 19: I suggest to remind what is the objective of the DTW method first.

7. P3 line 20: It is not clear to me what the "wave traced in discharge time series" means. Could the authors please try to clarify?

8. P 3 line 21: "is" is missing after "this" I think

9. P 6 line 2: could the authors please clarify what is a "FLOW 2000" measuring device: ADCP, current meter? Moreover does this sentence mean that flow velocity is measured continuously?

10. P7 line 5: Could the authors please clarify what they mean by Ardennes Meuse catchment?

11. P7 line 11: The concept of complete randomness is not totally clear to me. Could the authors try to clarify?

12. P7 line 11: sum of daily precipitation: do you mean the sum over the Meuse catchment?

13. P 7 line 16: I think it should be "stations" instead of "station"

14. P 8 line 23: for the sake of clarity, I would suggest to move "over a distance of. . ." right after "water level difference"

15. P 9 line 3-4: "The discharge magnitude. . ." I do not really get the point of this sentence. Could the authors please clarify?

16. Figure 1: It is not clear to me what "flood potential" do mean. Could the authors please clarify? Moreover, I do not understand the colour bar (values in m?)? How the expected flooded area is obtained (DEM height values thresholding, if yes I am not

sure this is meaningful)?

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