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Discussions

Interactive comment on "A stepwise GIS approach for the delineation of river valley bottom within drainage basins using a cost distance accumulation analysis" *by* Gasper L. Sechu et al.

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Thank you for your feedback and concerns. We have addressed them as follows:

1) In the Introduction the review is not complete either concerning the existing flooding based methods (for instance: Nardi et al. 2019) and concerning the slope-based approaches (for instance: DTW approach, as mentioned by the first reviewer).

- As we responded to the first reviewer, we can reference the DTW model for its practical similarity to our model. The tools we presented are some that exist, Nardi et al. 2019 is a global framework for floodplain delineation, which may not be suitable for

C1

local delineations.

2) It should be clearer the added value of the proposed tool comparing the results to the other available methods.

- We explained the value of this work in the discussion section, where we outline that our tool solves issues of scaling through the cost distance accumulation algorithm by resolving cutoff valley bottom boundaries at relative distances in different configurations of valleys within the same drainage basin.

3) I found unclear the difference between floodplain and river valley bottom definition.

- As we explained in the paper, the valley bottom includes the river and its floodplain (line 41). However, we will change the description of the definition of the differences between floodplain and river valley bottom in order to make it more clear, that the floodplain is the area adjacent to a river i.e., stretching from the riverbank to the edge of the valley.

4) It should be clarified the proposed method description. If the reader would like to apply the method and he/she follows the Section 3.2, I do not think he/she would be able to do that. For instance line 171 "small positive value" is vague; the same for lines 186-187; and 193-194.

- Line 171: The "small positive value" could be construed as vague, for clarity, we can change that to "a value close to zero but not zero e.g., 0.0000000001".

- Line 186-187: I believe this makes sense since we are explaining that our delineation uses wetland areas that are adjacent to rivers as a guideline.

- Line 193-194: Also makes sense since we follow up with Figure 8b and Figure 9, explaining why we use 500.

5) why the validation is not performed on the entire Denmark? three validation areas can not support conclusion for the reasons mentioned by the authors in the discussion.

C2

- Unfortunately, these three areas are the only ones that we could use to validate the model, it is the only measured data that have. It is a monumental task to digitize old topographical maps on a national scale even in Denmark