

Interactive comment on “Probabilistic Flood Extent Estimates from Social Media Flood Observations” by Tom Brouwer et al.”

The authors would like to thank the anonymous referee for his or her enthusiastic response to our article. We are convinced that the proposed changes will greatly improve the paper. Our responses to the comments of the anonymous reviewer, along with the changes to the article we propose, are discussed in the paragraphs below.

The changes discussed below are also included in a ‘track-changes’ version of the original manuscript. This document is included as a supplement and also contains changes made to the article in response to the feedback of the first reviewer as well as some additional minor improvements.

RC: What is the $F(2)$ statistic is explained in the text (section 3.4), but not in the abstract. Please add a definition when mentioning $F(2)$ in the abstract.

AC: A full explanation of the $F(2)$ statistic within the abstract is not feasible, since it would involve multiple lines of text. This full description is included in chapter 3 of the paper. To indicate the relevance of the $F(2)$ value in the abstract, we propose to change the following:

- Replace “...(~~$F(2) = 0.69$~~)...” with “...($F(2) = 0.69$; a statistic ranging from 0-1, with 1 expressing a perfect fit with validation data)...”

RC: Explain why the DWD has been estimated to range between 20 cm and 80 cm (section 3.3)

AC: This is indeed unclear. The decision to use this range was mainly based on photographs that were found in news articles of the floods. Therefore, we propose to replace lines 6&7 on page 7 with:

- *“Based on photographs in news articles about the flooding in York, the water depth in most places was estimated to be between 20 and 80 cm. Therefore, the DWD was varied between 20 and 80 cm. For the smoothing and power parameter, no clear information about the range was available. Errors in these parameters were simulated using the rather conservative ranges of 0-2000m and 2-5 respectively. A uniform distribution was used to simulate errors in the DWD, range- and power- parameters, since there was no specific information available regarding their error distributions.”*

RC: I understand that the (potentially large) uncertainties of the validation data were ignored when building the reliability diagrams. I therefore feel that the uncertainties of the probabilistic maps may be even more overestimated than claimed in the paper. Please discuss this issue, the possible consequences of neglecting the validation data uncertainties, and how they could be included in the analysis.

AC: We did not mention the uncertainties of the validation data in the article, although these might be important in evaluating probabilistic flood inundation maps. We propose to replace lines 13-16 on page 11 with the following:

“Furthermore, the results of the analysis could have been affected by the quality of the maps used for validation. The data for validating the river flood extents was created from a combination of ground observations and aerial photography. In places flooded separately from the river however, recorded historic flood extents were used, which might have been inaccurate. However, actual observed flood extents for 2015 were used for the majority of the area. Therefore, we have no reason to believe that there are large uncertainties in the validation data.”