

## ***Interactive comment on “Citizen observations contributing to flood modelling: opportunities and challenges” by Thaine Herman Assumpção et al.***

**Thaine Herman Assumpção et al.**

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We would like to thank the reviewer for the revision. We appreciate the comments provided, that deliver insightful and enriching recommendations on how to improve the content of the paper. We have addressed your comments individually in the text below.

**Comment #1:** This paper present an interesting and fairly complete review on the use of crowdsourcing for flood modelling purposes. The effort to try and characterise the reliability and uncertainty associated to different types of data and different methods of involving citizens in collected them is worth highlighting. I would limit my review to three general comments: (1) There is no mention in the paper of the diversity of

models that are used for flood modelling, and whether they are more or less suited for integrating the different types of citizen observations. Arguably, one of the challenges for hydrologists could be to design models specifically for that purpose. At least, it would have been interesting to have some information of the kind of models used in the studies analysed in the paper.

**Authors' response:** The manuscript will be modified to include an explanation on types of flood models (fluvial, pluvial, coastal and drainage). The matter of suitability is not addressed, mainly because the considered papers are not addressing the suitability. However, we found this comment very valuable and we will add more information on the models used in the reviewed studies.

**Comment #2:** (2) the question of time is only very briefly discussed, while in flood modelling, and particularly for real time flood forecasting, this is an critical issue: models not only require the highest water level or the maximal flooded area extension (which are, I guess, when most of the observations are done), but high resolution data during the rising part of the hydrograph. What have been done to collect this information, and/or what type of participatory approach should be organised to do so?

**Authors' response:** In the section 'Crowdsourced data information content' on pages 17-18, we discuss the question of time within each part of the flood modelling cycle. Flood forecasting is not included because citizens cannot provided forecasting data. We acknowledge that we do not consider calibration and validation for specific purposes and thus do not consider them done specifically for obtaining an operational model for flood forecasting. With that in mind and in view of the reviewer's comment, we will change Table 6, in the column 'Calibration Validation', the temporal coverage to 'Discrete/Continuous' and the spatial coverage to 'Discrete/Distributed'. A remark will be added to the table mentioning that the data properties for calibration and validation depend on the purpose of the model. Moreover, the discussion on page 18 and line 8 is extended to accommodate such view and answer the question on what has been done

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to collect this time sensitive information. Organisation of participatory approaches are not discussed as they are outside the scope of the proposed article.

**Comment #3:** (3) In the same line, rainfall is almost absent in the discussion. As far as I know, crowdsourcing have also been used to obtain spatially distributed rainfall, and many extreme storm events are characterised by a high spatial variability of rainfall, so I suspect that this type of citizen observation could be useful.

**Authors' response:** We agree that contextualization of the rainfall component is lacking and this will be added to the manuscript. We will mention its importance for certain types of flooding and will provide pointers to articles on crowdsourced data for rainfall. We acknowledge that citizen contributions could be useful for observation of this variable, however, we will not include rainfall in the flood-related crowdsourced data section because it is already covered by the review of Buytaert et al. (2014). Rainfall is a variable of greater importance for hydrological models, whilst the review focusses on a hydrodynamic representation of floods.

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