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Interactive comment on "Comment on "Can assimilation of crowdsourced data in hydrological modelling improve flood prediction?" by Mazzoleni et al. (2017)" *by* Daniele P. Viero

Anonymous Referee #2

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The author makes some significant critical remarks on the work of Mazzoleni et al. (2017) that are worth to be considered for publication. However, I would first advise to mellow the tone of the narrative. In addition, I invite the author to make sure that the comments are more general and less focused on the upper Bacchiglione river catchment presented by Mazzoleni et al. (2017). In doing so, Section 2.1 should be reduced considerably, as most of the information and comments seem too specific, and might not be supported for the other test sites. The paper of Mazzoleni et al. (2017) aimed at investigating the value of information retained by crowdsourced data (CSD) when assimilated in surface flow models for flood prediction. Their work is admittedly a proof-of-concept study and the synthetic feature of CSD is quite clear, rather than

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“briefly mentioned”. Their conclusions are correct so long as one assumes the model well represents the physics of the hydrological system, which is a fundamental hypothesis behind observation simulation system experiments. On the other hand, I agree that there seems to be an inherent tendency in Mazzoleni et al. (2017) to present results in a way that somehow overstates the importance of CSD. There are, in my view, some major points that need to be highlighted: âĂć The method chosen for calibrating a model should be consistent regardless of the type of data used. For non-linear models, ensemble based data assimilation methods (e.g the EnKF or the PF) are attractive in that they can be used to update jointly model states and parameters and provide a direct measure of uncertainty. Note that these models cope directly with problems of over parameterization and equifinality since parameter posterior distributions are represented by ensembles. âĂć CSD can be instrumental to reduce model uncertainty. Indeed, one can assimilate these data together with traditional hydrologic observations, thereby reducing parameter uncertainty even in those regions where the original reliability of the model is inadequate. In general, the value of information of these data is strictly dependent on their quantity, quality, spatial-temporal distribution. Note that typical data assimilation algorithms are in principle able to screen out noisy data automatically, but need to be modified to tackle possible data bias, which otherwise leads to poorly calibrated models. Thus, it is important, regardless of the nature of the data, to verify if such bias exists before any data assimilation is applied.

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