

## ***Interactive comment on “Value of uncertain streamflow observations for hydrological modelling” by Simon Etter et al.***

### **Anonymous Referee #1**

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The manuscript entitled “Value of uncertain streamflow observations for hydrological modelling” presents interesting and novel research on the worth of citizen science discharge observations for the calibration of lumped hydrological models. The manuscript is well structured and concise with a clear motivation. The presentation and the application of the methods are scientifically sound. My comments are mostly of minor character and therefore I hope to see this article soon published in HESS.

general comments:

-The presentation of the calibration experiments is clear and complete with regard to the model performance. However, I was wondering how the model robustness is affected by uncertain observations which was neglected by the authors. From a modelling point of view parameter uncertainty and its reduction through calibration is of

high importance. Therefore I believe that an additional figure on that matter would improve the quality of the study. How do the different temporal resolutions of observations as well as the three applied error scenarios affect the parameter values and their uncertainty compared to the benchmark case? This issue should be discussed in light of model equifinality.

-In my opinion the authors should be more specific that their study addresses lumped hydrological models. For integrated spatially distributed models such a study surely would have different implications. Therefore I suggest to clearly state this throughout the manuscript; especially in title, introduction and discussion.

specific comments:

-In the introduction the authors provide a great overview on existing studies addressing the question how much data is needed to calibrate a hydrological model. I am wondering why the findings vary so drastically between days to years. Can the authors provide an explanation for this?

-The applications of citizen science in hydrology are broad and go beyond the collection of data. For completion the authors could mention Koch et al. (2017) where the human perception was consulted to compare the similarity between simulated spatial patterns in order to evaluate spatial performance metrics.

-Extreme outliers are filtered with respect to maximum possible streamflow values. One could imagine a more thorough filtering based on the season. An extreme outlier during low flow season can be expected to be smaller than during high flow. Have the authors considered such an improved filtering?

-I can imagine a better visualization of the data in Figure 3. Instead of nine subplots one could imagine three subplots, one for each temporal resolution. Then each error scenario could have a different color. In this way the graphs could be stretched over the entire page and the dynamics would be more visible.

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Koch, J., & Stisen, S. (2017). Citizen science: A new perspective to advance spatial pattern evaluation in hydrology. PloS one, 12(5)

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