

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

**Anonymous Referee #2**

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### General Comments

The manuscript titled “Value of uncertain streamflow observations for hydrological modelling” is a helpful contribution to the growing body of literature on citizen science applications in hydrology. The article is scientifically significant, is of high quality, and is well presented. The objectives of the study are clearly stated, the methods are applicable, the results are clear, and the discussion and conclusions return to the original questions posed. The overall structure of the article is sound, and the prose is for the most part acceptable. However, efforts should be made to make the language more concise by separating long sentences and properly using commas and semi colons to join dependent and independent clauses, respectively.

The following are a few more general comments. First, in the conclusion, only the

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first question regarding errors and not the frequency of observations is included; it is suggested that both questions be briefly addressed. Second, the “lower benchmark” is an important part of this study, and the one sentence dedicated to it (7-13/14) doesn't provide enough information on how it was developed. Finally, additional discussion of how training could possibly decrease errors in citizen science streamflow estimates should be included (perhaps this is also included in the other paper in review). For example, should the focus be on improving depth, width, or velocity measurements? Are there any simple tools that could be added to improve the estimates? For example, could photos of the site including a person for scale (for area) and short videos (for velocity) be used to identify (and possibly filter) high error estimates?

Specific Comments (page # - line # - comment)

2-23/24 - The “stick-method” is unfamiliar and should have a reference or some description. Is this the same as the “float” method, or ?

4-7 - USBR Water Measurement Manual 2001 Ch 13.10 recommends variable surface velocity with depth

5-2 - do you have raw velocity and area data to further evaluate if the errors come more frequently from velocity or area estimates? Perhaps if you have the width and depth estimates this can also help to unpack uncertainty in areas estimates further.

6-8 - Is the one point per hour randomly selected or ??? Is hourly data a plausible citizen science output? You later say (9-21/22) that this frequency is “very unlikely.” What was the frequency of the original data?

5-12 - it might be nice to more explicitly include a summary (e.g. bullet points) here of the four levels of error that you refer to later: none, low, medium, and high

7-13/14 - perhaps the range bounds on the parameters for the random selections need to be discussed further

9-25 - rather than “reduced errors” it would be better to specific either low or medium

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like you do later in the sentence

9-27/28 - it would be good to consistently use either “lower benchmark” or “random parameter datasets”

10-25 - it is unclear whether “fewer data points” here is referring specifically to calibrations with only 12 observations or to calibrations with even fewer than 12 observations (which wasn’t evaluated)

10-27/28 - only if the errors don’t contain systematic bias; please clarify

11-7/8/9 - this sentence doesn’t seem to match the main point discussed earlier in the paragraph. Earlier you state that monthly performed better than IntenseSummer and WeekendSummer which had roughly 5 times more measurements. The you say it is “easier to get a certain number of observations. . .” Is it rather easier to get measurements spread out through the entire year than a certain number of measurements with citizen science?

Technical Corrections (page # - line # - comment)

1-7 - “. . . model can be parameterized using on a limited. . .” need to either remove “on” or modify sentence otherwise

1-16/17 - suggest using more commas to properly phrase the content (also the last sentence of the abstract could benefit from the same)

1-29 - punctuation for the question within the sentence should be used: “. . . question: how much data. . . . are not available?”

2-14 - same issue here where you end the sentence without a question mark. Either edit similar to above or rephrase: “but the question of how informative low quality data are remains.”

3-5 - should define HBV here (first use) instead of below

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4-18/19 - sentence is incomplete

6-17 - it seems more logical to include Crowd52 and Crowd12 in the bullet list of the six other temporal resolutions presented

9-2 - correct grammar error “. . . was larger for than the. . .”

9-13 - which year are you referring to here: calibration or validation?

13-19 - “. . . this data was not statistically significant better. . .” needs to be revised to possible “. . . these data did not show statistically significant improvements in model performance. . .”

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