

## # Report 1

We express our gratitude to the reviewer for the suggestion, which is rigorous and improves the quality of our manuscript. Following careful consideration, we have amended the manuscript in accordance with your valuable suggestion. Our response to your suggestion is provided below.

- I'm satisfied with the responses provided by the authors. Perhaps one minor point is to explicitly acknowledge the limitation in the manuscript of discretizing the parameter values, noting that this is not strictly necessary since there are established methods for solving the optimization/posterior inference problem in continuous space (e.g. Monte Carlo) without the need for differentiation (as the authors argued in their response).

### **Response:**

In the revised manuscript, we acknowledged the limitation of discretizing the parameter values, and offered additional recommendations accordingly (**Line 503**):

Fourth, it is imperative to acknowledge that the parameter values in this study were discretized, although hydrological model parameters are inherently continuous. This discretization approach could result in the omission of optimal solutions, particularly when hydrological models exhibit sensitivity to these parameters. It is important to note that discretization is neither a requisite nor a recommended strategy. Future research should address the optimization or posterior inference problem in a continuous parameter space based on established methods such as the Monte Carlo algorithm.

### # Report 3

We express our gratitude to the reviewer for the editorial suggestions, which will very improve the quality of our manuscript. Following careful consideration, we have amended the manuscript according to your valuable comments. Our responses to your comments are provided below.

#### **Editorial comments:**

- I suggest changing the first sentence of the abstract to, "Hydrological parameters should pass through a careful calibration procedure before being used in a hydrological model that aids decision making." That way it is clear the hydrological parameters are used in the models which are in turn used for decision making. The "parameters" aren't used for decision making typically in my understanding.

#### **Response:**

Modified as suggested (**Line 12**).

- line 16 - suggest "corresponded" (instead of "corresponds) to keep the tense consistent through the sentence"

#### **Response:**

Modified to "corresponded" as suggested (**Line 17**).

- line 29 - suggest "Hydrologic modeling \*has\* a relatively well-established theory" or maybe \*is based on\* or something similar. Just to communicate more clearly since modeling is not theory but is based on theory

#### **Response:**

Added "based on" as suggested (**Line 30**).

- line 42 - suggest changing "they have no motivation" to "these cities are not always motivated"

#### **Response:**

Modified as suggested (**Line 43**).

- line 73 - suggest changing "we have several hydrological models" to "we have several versions of a hydrological model" so that people know you it's not like you have SWAT, HEC-HMS, CN, etc.

#### **Response:**

Modified as suggested (**Line 74**).

- Several of the figures were quite pixilated. I assume that will be worked out by the copy editors, but bringing it up just in case.

#### **Response:**

We will improve the figure quality in the next process according to the suggestion of copy editors.