

## ***Interactive comment on “A Multi-Objective Ensemble Approach to Hydrological Modelling in the UK: An Application to Historic Drought Reconstruction” by K. A. Smith et al.***

### **Anonymous Referee #1**

Received and published: 6 March 2019

#### General Comments

This manuscript is a thorough evaluation and description of a new modeled dataset reconstructing historical flows in the UK. The authors do a good job outlining both the utility and limitations of the dataset they have created. This article makes very good use of graphics to convey complex information about a large number of data points; I especially like Figure 2. Overall, this is a high-quality paper, with just a few areas that require clarification (see "Specific Comments") or technical corrections (see below).

#### Specific Comments

Lines 358-360: The statement about selecting a “best” simulation rather than extracting  
C1

a mean or median from the ensemble appears to be a very strong statement based only on some qualitative examples. The authors could just say that selecting a “best” simulation is SOMETIMES more accurate than using an ensemble mean. Otherwise, if the authors wish to back up their statement, I think they would need to do a more thorough analysis comparing both LHS1 and the ensemble means (or medians) to the observations.

Lines 477-479: I don't quite follow the meaning of the sentence “They concluded that . . . eliminate the influence of different PET inputs on runoff simulation.” Does this mean that PET is not an important variable in predicting runoff? Does it mean that the hydro-logic models have low sensitivity to small errors in PET? Please clarify.

#### Technical Corrections

Lines 70-73: These sentences are a little confusing, because it is unclear whether you mean the same thing by “hydrological models” and “rainfall-runoff models.” Are you saying that your methods are different from those used by Caillouet et al (2017) in France, or that Caillouet et al (2017) is a rare example of the type of analysis you have done for the UK?

Lines 75-6: “They can be used . . . prior to observational network” is an incomplete sentence. Please revise.

Line 125: It is not necessary to state that the catchments are shown in Figure 1, as this was already stated on line 123.

Line 193: Please also define “LHS500” in the methods section before using it here. At present, it is not defined until line 212.

Line 225: Please provide more information about what the Tweedie distribution is.

Line 323: Add an apostrophe at the end of “models.”

Line 518: Change “catchments” to “catchment's”

Line 523: Change “This contributions” to “The contributions”

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-3>, 2019.