

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-451

Anonymous Referee #1

Referee comment on "Producing hydrologic scenarios from raw climate model outputs using an asynchronous modelling framework" by Simon Ricard et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-451-RC1>, 2021

I am pleased to provide a review of the manuscript "Producing hydrologic scenarios from raw climate model outputs using an asynchronous modelling framework" by Simon Ricard, Philippe Lucas-Picher, and François Anctil. This study attempts to develop a framework to construct hydrologic scenarios without resorting to meteorological observations. The framework has been applied over four subcatchments of the Chaudière River, Canada, using North American CORDEX simulations and a pool of lumped conceptual hydrologic models. The subject is appropriate to be published in the Hydrology and Earth System Sciences. Also, I personally agree with the alternative concept to offset a conventional limitation in the climate change assessment modelling cascade. Although the topic of this study is very interesting, the paper significantly needs to be improved.

To sum up, I recommend a rejection for the current format but encourage resubmitting their draft with a substantial revision. I hope that my comments will be helpful for the authors.

1. Draft structure: section 2.1 "The Chaudière River catchment" is not appropriate for the section of Methods. It should be separated. Also, section 2.3 "Climate model outputs" is not appropriate for the method section. This draft does not have the results section, which would be proper for section 3. The contents of the draft have to be reorganized.

2. No method description: The novelty of this draft is to suggest a workflow, enabling the production of streamflow projections without post-processing climate model outputs and without using meteorological observations. However, the draft does not explain their methods in detail. Although the authors do not need to present all the methods that they have used in this draft, they should provide sufficient information related to their novelty. The workflow section (i.e., section 2.2), which, I believe, is the most important section in this draft, mainly declare previous studies to explain their methods. In addition, they have written mainly less than 10 lines in the said section. Their way of describing their methods is not desirable. To be specific, the authors should describe the details of the asynchronous calibration loop and the quantile perturbation in their contents.

3. L44: insert one more " intermodel similarities (Ahn et al. 2019)"

"Incorporating climate model similarities and hydrologic error models to quantify climate change impacts on future riverine flood risk"

4. L118: In Figure 1, it is hard to recognize the number for each site. Increase its size.

5. L123: Did you use all recorded years for streamflow? if not, please be specific.

6. Table1: "Hydrometric station" This is not well defined. Is this station ID?

7. Table1: Area unit: superscript

8. L202: the same evapotranspiration formulation: what method did you use?

9. Figure7: What is "P" here?

10. L304: exclude "never"

11. L347: asses a typo

Overall, the draft is relatively short. The authors should provide sufficient information for the method and results.