

## ***Interactive comment on “A Bayesian joint probability post-processor for reducing errors and quantifying uncertainty in monthly streamflow predictions” by P. Pokhrel et al.***

**Anonymous Referee #2**

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General comments The paper is well written, and has good structure, figures are informative and have very good quality. The topic is interesting and has practical significance. Overall, I recommend the paper for publication, although I would suggest authors consider several minor additions.

Firstly, the methods presented in the paper are complex and perhaps less accessible to a wide body of readers who may not be familiar with bayesian methods. Perhaps it would be good to add a short paragraph describing basics of the bayesian inference in not-so-technical language.

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Secondly, it would be good to demonstrate not just that the method works for the purpose intended, but also how its performance compares to simpler methods of error and bias correction, such as linear regression or quantile remapping.

Thirdly, authors stress the method's skill in reducing simulation bias. Obviously, the post-processor reduces biases/errors when they are large. However, equally teaching are cases when the method is not skilful. Perhaps a plot of the gain in RMSEP expressed as a percentage of original RMSEP would be better in expressing post-processor skill. Also, it would be interesting to see how performance of the post-processor varies due to other factors, such as error variance.

Lastly, the abstract revolves around the difference between post-processing on the daily and monthly basis, suggesting that the paper is about contrasting these two, which it isn't. The abstract should be rephrased to reflect the contents of the paper appropriately.

Specific comments: - p.11200 line3 ".. further reduce. ." further compared to what?

- p. 11202 line 12 "..reliable in uncertainty distribution.." what does that mean, exactly?

- p. 11203, line 7 "..grassland to semi-arid type of climate". Maybe other, more informative term than grassland could be used.

- p. 11219 fig.2 perhaps it would be interesting to plot too the BJP quantile ranges against the simulation error?

- p 11212 line 20. The authors write that in case of the use of post-processor for predictions based on rainfall forecast, the post-processor would increase uncertainty spread to account for uncertainty in forecast rainfall. This is difficult to conceptualise. Perhaps a procedure for such application could be outlined in a couple of sentences?

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