Response to Reviewers' Comments

We appreciate the efforts of the reviewers and we thank them for their insightful and constructive comments. We have addressed all concerns in this revised manuscript. Below, we provide detailed responses to each of the reviewers' comments. For convenience, we put the reviewer comments in black font, author responses in blue, and direct quotes from the revised manuscript *in italic.*

Anonymous Referee #2 comments:

The manuscript evaluates the ERA5 reanalysis as a potential reference dataset for hydrological modelling using two lumped hydrological models in North American catchments. They show, ERA-5 based hydrological modelling performs better and it is equivalent to the observations. Overall, the manuscript is written well and it is well within the scope of HESS. Therefore, I recommend the manuscript for publication, however, with some minor modifications.

Response:

We appreciate the reviewer's comment. Please see the response below.

I notice some bias pattern between west (cold) and east (warm). Perhaps this may be due to inability of ERA-5 in capturing recent increase in the frequency with which high amplitude ridge trough wave patterns result in simultaneous severe temperature conditions in both the West and East (singh et al., 2016; Raymond et al., 2017), or with some other reason. It would be good, if the author provides some explanation to this pattern in their revised manuscript. This study would form a good foundation for those regions where it lacks the observational gauge datasets (such in underdeveloped countries). The authors should add a discussion on this.

Response:

Thank you very much for these references and the hypothesis. As hydrologists, we are not experts in atmospheric/meteorological phenomena so these guidelines were of help to try and explain these noticeable bias patterns. We have added the following sentences in section 5.1 [page 12, lines 380-384]:

"There is also an interesting pattern of biases between the East and West coasts (Figures 2 and 3), which could be partly explained by some processes not being accounted for in ERA5, notably the high-amplitude ridge trough wave patterns which have seen a recent increase allowing severe weather in both the East and West simultaneously (Singh et al. 2016, Raymond et al. 2017), although ERA5 did improve the representation of many processes since ERA-I (Hoffmann et al. 2019)."

We have also added a sentence regarding the use of ERA5 in underdeveloped countries in section 5.6 [page 16, lines 525-527]:

"It could also be envisioned to extend this work to underdeveloped countries where there is a fewer number of observational gauges, where a good quality reanalysis might allow for improved hydrological simulations and better understanding of the regional weather characteristics."

References:

Raymond, C., Singh, D., & Horton, R. M. (2017). Spatiotemporal patterns and synoptics of extreme wetâAˇ Rbulb temperature in the contiguous United States. Journal of ˇ Geophysical Research: Atmospheres, 122(24), 13-108.

Singh, D., Swain, D. L., Mankin, J. S., Horton, D. E., Thomas, L. N., Rajaratnam, B., & Diffenbaugh, N. S. (2016). Recent amplification of the North American winter temperature dipole. Journal of Geophysical Research: Atmospheres, 121(17), 9911- 9928.