

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1  
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## **Comment on hess-2022-141**

Anonymous Referee #1

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Referee comment on "Low-flow estimation beyond the mean – expectile loss and extreme gradient boosting for spatiotemporal low-flow prediction in Austria" by Johannes Laimighofer et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-141-RC1>, 2022

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This is a well-prepared manuscript that presents a novel advancement in low-flow estimation using extreme gradient boosting. While the advancement is incremental in that it uses established methods for prediction, it fills an important gap in the literature by addressing low-flow prediction. Overall, I find few technical concerns, and I see no major impediment to eventual publication.

My only concern is with the model fitting. The authors observed middling-to-high performance across a range of methods, and they also note that the methods require something like 20-30 variables for prediction. I would be interested in seeing some discussion on how the large quantity of variables may or may not be indicative of overfitting. It seems, from my arm-chair analysis here, that overfitting could explain the rapid loss in performance for extreme low flows. I'd be interested to hear what the authors have to say.

Overall, the manuscript is extremely thorough while also remaining accessible. The procedures are accurately contextualized in relevant literature, and a good effort has been made to present the results in light of other work. The conclusions are supported by the analysis presented. While some typographical errors may exist, I, again, see no major impediment to eventual publication.