

Hydrol. Earth Syst. Sci. Discuss., author comment AC1
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Reply on RC1

Johannes Laimighofer et al.

Author 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.,
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Dear Reviewer#1,

We want to thank the reviewer for his positive feedback.

We will address all points raised in the review in the final author response. Here we give just a short remark on your point about model fitting.

We are aware of potential overfitting of machine learning approaches. This is why we implemented a nested cross validation procedure to reduce the possibility of overfitting the model. In our paper about parsimonious models for low flow estimation (Laimighofer et al. 2022), we showed that tree models use more variables than variable selection methods as GLM-boosting or Lasso.

It is inherent to tree models that variable selection is performed at each split individually, whereas GLM variable selection is performed globally, for the entire model. This systematically yields a higher number of predictors in tree-based models than in linear models. From this perspective, we can safely argue that the models are not overfitted (as assured by our nested CV scheme) and the large quantity of variables may not be indicative of overfitting. We will clarify this point in the revised MS.

References:

Laimighofer, J., Melcher, M., and Laaha, G.: Parsimonious statistical learning models for low-flow estimation, Hydrol. Earth Syst. Sci., 26, 129–148,
<https://doi.org/10.5194/hess-26-129-2022>, 2022.