

Interactive comment on “Catchment modeling and model transferability in upper Blue Nile Basin, Lake Tana, Ethiopia” by A. S. Gragne et al.

A. S. Gragne et al.

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Please note our general introduction to the referees' comments in our reply to referee #1.

We thank the referee for the general positive assessment and in particular the good ideas for future studies. In the following, we would like to respond to his main critical point and his/her 4 minor comments.

Response to main comment

We argue that the better model results in terms of discharge simulations and better model transferability for longer modeling time steps (15 and 30 days) is to a large extent caused by the averaging out of the data inaccuracies on daily base (short-time dynamics); cf. also discussion of data quality in response to referee # 3, in particular

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capturing of the fast flow fluctuations with daily water level measurements. As a physical explanation, we will discuss further more carefully in the revised manuscript the lesser importance of the different physiography (i.e. dambos; discussion of figure 4) in the two catchments for long-term runoff response, and its likely effects of short-term runoff fluctuations. We feel that we do not have more process data to explain these findings better.

The good idea of the referee to expand the parameter uncertainty analysis for different time steps and go further with a more complete 'GLUE-type analysis' is probably worth following. However, honestly, we do not have the man-power (estimated several months for a graduate student) in this project to carry this out. We also feel that considering the limited input data quality, a more extensive model parameter uncertainty study as we did already is not the most promising thing to do in this study area (cf. our response to referee # 1).

Response to minor comments

- 1) The introduction will be extended and the literature on model transfer studies will be integrated better.
- 2) A more detail description of HBV model and the applied CRs will be included in the revised manuscript.
- 3) While increasing the modeling time step from daily to 15 and 30 days, the input data were aggregated to 15 and 30 days and, consequently, the time step of the numerical simulation was changed accordingly.
- 4) Sorry, for the confusion; Figure 6 will be clearly explained in the revised manuscript.

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