

Interactive comment on “Are we using the right fuel to drive hydrological models? A climate impact study in the Upper Blue Nile” by Stefan Liersch et al.

Anonymous Referee #2

Received and published: 11 May 2017

General comments

This study evaluates potential impact of climate change on streamflow in the Upper Blue Nile basin (Ethiopia). The projections of climate change are defined by two model ensembles. The impact is assessed by using an eco-hydrological model. As a result, the authors evaluate and discuss the performance and effect of bias correction on rainfall characteristics in the reference period and future streamflow projections. They conclude that multi-model means indicate an increase in mean annual streamflow and a seasonal shift in the Upper Blue Nile.

In general, the manuscript is clearly written and evaluates a significantly large number of model simulations/projections. It has certainly a practical value and present valu-

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able information particularly for the water resources management in Ethiopia. I wonder however, to what extent and what is the significantly new scientific contribution (for international scientific audience). This needs to be formulated in a more clear way. In its current form, the manuscript reads more as a combination of a case study/technical report assessing the potential climate impact on hydrology in selected basin and a commentary discussing the value of bias correction for improving future hydrological projections. In both cases it is not fully clear, what is the novel finding. I would suggest to narrow the focus (main objective of the paper) to some novel contribution. For example, I found interesting the question to what extent can bias-correction alter the magnitude of change signals in hydrological simulations, however the results are given just in the supplement and not discussed and upscaled/generalized to other regions. Generally starting presentation of results with figures/tables in supplement is formally not very attractive (it looks that such results are only supplementary to the paper objectives). In the debate, I would expect some more discussion whether the application of bias correction in climate change impact studies is generally a scientifically sound approach (per se). Is it meaningful to apply/analyse future projections, if the climate simulations have bias already in the reference/historical period? I did not find a solid/clear answer to this question in the manuscript.

Specific comments

1) Section 3.5.1: Why are the high precipitation values truncated to 400mm? What is the performance of bias correction if applied to the historical period (e.g. if splitting the reference period to two parts)?

2) Model calibration efficiency: Why is hydrologic model validated at monthly time scale? What is the runoff model efficiency at a daily time scale? Which period is used for model calibration/validation?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-422, 2016.

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