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Hydrology and Earth System Sciences Discussions

Interactive comment on "Validation of SWAT simulated streamflow in the Eastern Nile and sensitivity to climate change" *by* D. T. Mengistu and A. Sorteberg

Anonymous Referee #1

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This paper presents its findings on the validation of SWAT simulated stream flow and sensitivity to climate change. However, it needs more details in the methodology and discussion. The paper does not present novel concepts or ideas, but does provide some basic information about the study area that could be useful for further comparative studies in that region.

Specific points:

1. The paper needs a lot of work to improve the grammar and construction of sentences to make it more readable. It is advisable to have a paper checked for grammatical errors

before submission to a journal.

2. Distinguish between ‘validation’ and ‘verification’. It seems these have been used interchangeably throughout the text.

3. Detailed description of the river network in Section 2 can be made brief. Provide a larger diagram (Fig 5) of the basins and the main rivers of the study area.

4. There is no mention of the model setup ; number of subbasins and the HRUs, area of the study area etc

5. There is no description of the climate change in the Methods (hypothetical or IPCC). These appear later in the results section 4.

6. The author should comment on whether land use has changed over time in the study area. Only one land use map is used for the whole period. The author mentions land use as one of the main factors affecting soil erosion and evapotranspiration.

7. Since evapotranspiration accounts for more than half the water balance, it should be discussed more in the results and especially in relation to sensitivity to climate change (precipitation and temperature) and landuse.

8. Comment on whether the modelled evapotranspiration is reasonable or within the expected range for the land uses in the study area.

9. Was the observed streamflow separated into surface runoff and baseflow prior to calibration? This would ensure that the simulated runoff and baseflow closely match the observed (separated) flow. Since the paper is about ‘Validation’, it requires a thorough model calibration that ensures all components of the simulated water balance are reasonable.

10. The paper could also benefit from an uncertainty analysis of the SWAT model (parameters and outputs).

11. Why was 2080-2100 chosen for the climate change analysis? It has been shown

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in many previous studies that the uncertainty in future climate change is much greater than that due to parameterization of hydrological models. Comment on how meaningful the results presented here are?

12. Generally, results should not be repeated in the 'Summary and Conclusion' section unless they emphasize a main point in the conclusion.

13. In my opinion, appendix A is not necessary. A reference to the SWAT manual should suffice. Appendix B should just be 'Acknowledgement'.

14. Improve on figures. Some are too small to be seen well.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 9005, 2011.