Hydrology and Earth System Sciences Discussions

Interactive comment on "Critical review of the application of SWAT in the upper Nile Basin countries" *by* A. van Griensven et al.

A. van Griensven et al.

a.vangriensven@unesco-ihe.org

Dear reviewer,

many thanks for all the suggestions. We may not incorporate it in this paper, but we hope that future research (and review processes) my tackle your raised issues. I am happy to give some responses.

We have been thinking of your comment to give examples of papers that provide the necessary information that we consider to be necessary to do a proper evaluation. However, at this stage we mainly want to point to the lacking of consistency in the way models are reported in literature. Neither is there a protocolol for reporting/reviewing

for this type of studies. We hope that our paper can contibute in having first of all a better agreement on the review process, before pointing out already what is properly done and what not.

Also the fit-to-geography is a very good suggestion. However, I think it is going out of scope if I would go further in it. I have already grouped the papers in those who are located in Ethiopia, and those who are located in the Lake Victoria basin countries. However, it is hard to make an evaluation based on geographical location. Eg in Ethiopia, the performances of the model seem to be much higher then around lake Victoria. This is however mainly due to the rainfall pattern, where Ethiopia has a very distinct and strong rainy season. Errors in rainfall are compensated by other rainfall events as they all form to a very big flow peak where the different rainfall events are blended. In Lake Victoria, you have more isolated rainfall events. The errors in the rainfall observations will the become very visible in the flow curves.

Thanks also for mentioning the bias. We did an analysis on the model bias, but it was generally not reported so we decided to do a comparative analysis of NSE values which were reported much more often. Nevertheless, I would like to mention that problems with bias may for sure arise in the hydrological models. Bitew and Gebremichael (2011) reported biases for different sources of rainfall. While in the calibraion the bias was not more then 25, in the validation period, simulations where obtained, up to -75% of the total flow!

Also many thanks for the smaller comments which I could incorporate in my revised paper, as reportd below.

Kind regards,

Ann van Griensven & co

Technical comments: I could ïňĄnd only a few typographic and language problems that I am listing below: P3764-L14: replace "journals" by "articles" Changed to journal

papers P3765-L12: replace "More than 20 peer-reviewed papers were identiïïňĄed out of which more than half are located in Ethiopia which are listed in Table 1 according to their topic."

RESPONSE:Done

By: "Twenty-two peer-reviewed papers were identiïïňĄed with their main topics addressed (Table 1), out of which more than half are located in Ethiopia."

RESPONSE:Done

P3766-L19: I do not understand this sentence: ": : :by bracketing more than 60% of the observed river discharged", please express this better.

RESPONSE:Done: changed to "Further, the paper reported that more than 60% of the observed river discharge fall within the 95% confidence bounds"

P3766-L21: Split and simplify the sentence: Mekonnen et al. (2009) developed a generic rainfall-runoff model better suited to Ethiopian catchments. They used a spectrum analysis method to extract the relationships between different temporal scales of available daily rainfall and runoff series that reflect the temporal and spatial scales of 25 discharges in two watersheds in Ethiopia."

RESPONSE:Done

P3776-L24: change to: ": : :between 0.49 and 0.6 are more in line: : :" We do not see the difference from original text, this comment is not clear to us. P3777-L7: replace: ": : :and cause that in the model there is an increase: : :" by ": : :causing an increase: : :"

RESPONSE:Done

P3777-L9: split and correct sentence like this: ": : :into the calibration process. This may result in simulations where the shallow aquifer volume is much larger at the end compared to the beginning of the simulation (up to 1500 mm)."

RESPONSE: Done

Table 2. GW_REWAP, number of reported values: 2.6??? This number should be an integer?

RESPONSE: You are absolutely right. The value should be 8. Done.

———————————————————