

Interactive comment on “Validation of SWAT model for stream flow simulation and forecasting in Upper Bernam humid tropical river basin, Malaysia” by A. W. Alansi et al.

A. W. Alansi et al.

wahab159@yahoo.com

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We would like to take this opportunity to extend our gratitude to all our reviewers who had spent their time in carefully reviewing and suggesting improvements for the manuscript. The suggestions made by the reviewers have greatly enhanced the quality of the work presented in this manuscript. The following are the detailed responses to the comments made by the reviewers:

Response to the comments made by Reviewer # 1:

Comment #1: The paper needs a complete revision and editing by a native English
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speaking editor. Throughout the manuscript, there are numerous grammatical errors of articles, subject verb agreement and run on sentences. The numerous errors made the manuscript difficult to read.

Response: This is a very good comment and suggestion provided by the reviewer that will help improve the manuscript and we really appreciate it. For that, the manuscript has undergone a thorough professional editing and revision, whereby all errors pertaining to language usage are identified and amended accordingly.

Response to the comments made by Reviewer # 2:

Comment #1: The paper lacks fundamental scientific analysis and detail and reads in its current form more like a report than a scientific paper. For example, the authors state that the study showed that “SWAT was able to simulate and forecast flow in humid tropical conditions successfully and can be used to study the effects of future land use changes on flow” (page 7582, line 21), but throughout the paper there is no discussion or analysis, if the underlying model assumptions of the SWAT model are also valid for the humid tropical region and thus if the model is right for the right reasons. This is especially essential as the SWAT model is based on the SCS approach that was originally developed for application in the United States. In this context the paper could also benefit from comparing and analyzing the performance of different models on the same data set.

Response: We welcome the comments made by the reviewer and have incorporated an additional discussion on the factors affecting runoff generation based on the SCS approach in the revised manuscript (section 1.0, page 2, lines 24-29& page 3, lines 13-16). With regards to the validity of the SWAT model for the humid tropical regions and if the model is appropriate for the right reasons, apparently, the SWAT model has been extensively used worldwide including the sub-tropical sub-humid regions (section 1.0, page 3, lines 25-29). In addition, the study conducted by Babel et al. (2004), using the AGNPS model based on the SCS method for the simulation of flow in the

tropical climatic condition of Thailand, adjusted the CNs for wet and dry conditions for tropical condition. The results of runoff positively matched with the observed data. Moreover, SWAT 2005 incorporates optional alternative methods to calculate potential evapotranspiration (PET), surface runoff and daily curve number. The retention parameter used to calculate the daily curve number value can be a function of soil water content or plant evapotranspiration. By calculating the daily CN as a function of plant evapotranspiration, the value is less dependent on soil storage and more dependent on the antecedent climate, which makes it suitable for watersheds of different climatic conditions (revised manuscript, page 3, lines 1-11).

However, in our study area, all assumptions and values used during the calibration process were within the limits defined in the model and the CNs were adjusted for wet and dry moisture conditions as specified in the SWAT theoretical documentation (revised manuscript, section 4.1, page 9 lines 16-18). As for the suggestion to compare and analyze the performance of different models on the same data set, we really appreciate the suggestion. However, it is beyond the scope of the paper.

Comment #2: The paper lacks any discussion on the causes for changes in runoff generation: Are land use changes the only factor? What about climate change or changes in possible water abstractions? These are essential questions that need to be analyzed and discussed in detail before any model or scenario application.

Response: This is a very important comment made by the reviewer. We have added a discussion on the causes of runoff generation and particularly for tropical region in the revised manuscript (section 1.0, page 2, lines 24-29 and page 3, lines 13-16). As for our study, we performed 5 scenarios, whereby the planned land use for the year 2020 had been applied to the years 1984, 1990, 1997, 2002 and 2006 using the actual rainfall for those years and then compared with the generated runoff of the actual runoff in order to find out the individual effects of land use changes on the flow pattern. Based on that, the individual effects of land use changes on the runoff pattern were obtained (section 4.3, page 10, lines 23-27). In fact, the reviewer raised a very good and new

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direction to study the effects of climate change on the stream flow pattern in tropical regions, which we are planning to do in future work

Comment #3: The paper suffers from severe language and reporting errors that makes it very difficult to understand (e.g. listing of statistical performance measures on page 7590, line 17-19), also some sections (e.g. 4 results and discussion) are too short and lack fundamental information, while others are too lengthy for standard approaches (e.g. 3.5 statistical approaches).

Response: The manuscript has been edited for language inconsistencies. Thus, all grammatical and structural errors in the manuscript have been identified and amended accordingly by a language expert. In addition, we have also included more fundamental details in the result and discussion section (page 10, lines 27-31). As for the comment on the lengthy description of the statistical approaches, it was provided to fulfill the necessary information required in order to adequately describe the statistical methods performed.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 7581, 2009.

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