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Discussions

Interactive comment on "Streamflow simulation methods for ungauged and poorly gauged watersheds" *by* A. Loukas and L. Vasiliades

Anonymous Referee #1

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The paper presents the procedure for dealing with gauged or poorly gauged watershed in order to simulate streamflow data. As a modelling tool, the UBC model is used which is a continuous conceptual model. The description of model and its parameters is too detail in my opinion but I cannot say that it needs to be rewritten. In general, the paper is interesting because there are many papers discussing the efficiency of different models using data for well gauged watersheds. It is common that physically based models are used for ungauged watershed and I see the importance of this paper mainly in the application of conceptual model for given purpose. On the other hand, I would find interesting if the methodology is verified deeper for some watershed as the first step despite there are references to papers presenting the application of UBC watershed model worldwide. I have some comments to the paper which could in my opinion

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improve its comprehensibility. First, parameters V0FLAS and V0FLAX are mentioned to be characteristics of a given watershed (pg. 1047, lines 19-20) but it is not said to which watershed characteristics they are related. I think that it would make further parts of paper clearer. It is also stated in section 3.2 (pg. 1048, lines23-24) that some parameters were set to default values while others were estimated. It is necessary, in my opinion, to define which parameters were estimated and how. In section 3.2.2 (pg. 1059, lines 12-14), the analysis of maximum annual peak flows is mentioned which was carried out based on two methodologies for four catchments. I think, that it should be mentioned which of three discussed methodologies are considered. It seems to me that all three methods were used for frequency analysis (fig. 9). Furthermore, it is not mentioned at this part which of five watersheds was not analysed and why although it is described later. In total, five very different watersheds were used for the analysis which have limited amount of measured precipitation, temperature and discharge data. The results of all three methods are, in my opinion, very good considering very limited input data. In general, the results are comparable for all three applied methods and the differences are not very high mainly when comparing UBCCLA and UBCANN. In this sense, the combination of UBC model in combination with ANN doesn't seem to be a significant improvement and it is properly called as an alternative in the conclusion section. Additional comments: Pg. 1044, line 1: missing word "watershed" (UBC watershed model) Pg. 1044, line 5: word "in" is missing in the sentence (. . . can be divided IN up to . . .) Pg. 1044, line 19: I think that the word "routine" should be inserted (after . . . soil moisture . . .) Pg. 1067, line 6: "developed procedures" should be used instead of "develop" procedures Pg. 1068, line 6: I would be careful with the use of term "physical modelling" as the model applied is not physically based Pg. 1092: I don't know why the frequency distributions are drawn using plot of flood discharge against frequency factor. I would prefer if frequencies are used instead of frequency factor or if the Gumbel plot is used but it is perhaps only my personal opinion.

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