

Interactive comment on “Hydrological modelling and future runoff of the Damma Glacier CZO watershed using SWAT. Validation of the model in the greater area of the Göschenalpsee, Switzerland” by Maria Andrianaki et al.

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The first reviewer discusses that the Nash criterion is not a good indicator for strongly seasonal signals. In this context, it seems questionable whether SWAT has any predictive power for the validation catchment (without re-calibration). The authors state: "The efficiency of inflow predictions (NS) dropped to 0.49 and the R2 to 0.72, which are however satisfactory. The observed and predictive accumulative flow is presented in Fig.5(b)".

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A Nash value of 0.49 for such a strongly seasonal signal might have no predictive power (Schaeffli and Gupta, 2007). A simple experiment illustrates this: if you generate a sine curve that has the same seasonality as the observed discharge, similar amplitude and the same mean, and no negative values (e.g. by shifting the sine curve), then the Nash value of this signal (compared to the observed discharge) most likely has a Nash value of between 0.4 and 0.5. Attached to this comment is a Matlab example, including an illustration.

Given the above, I think that we need more evidence that the model actually has predictive power. A key question is hereby whether the model can predict winter low flows (i.e. it gets the baseflow right), general timing of snow melt, general timing of high flows, autumn recession etc.

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-493/hess-2018-493-EC2-supplement.zip>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-493>, 2018.

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