

Interactive comment on “Assessment of the Hype Model for Simulation of Water and Nutrients in the Upper uMngeni River Catchment in South Africa” by Jean N. Namugize et al.

Anonymous Referee #1

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The main objective of the work is to test the capability of the model HYPE to simulate streamflow, transport of dissolved inorganic nitrogen and total phosphorus which were observed in a river catchment in South Africa. The HYPE model requires an estimate of more than 100 parameters. The authors selected 25 of them (6 for streamflow and 19 for water quality) for standard manual model calibration. Because some of them are land use dependent, it is not clear to me if the number of calibrated parameters is 25 or if it is much more, related to the different land uses that exist in the catchment. After calibration, the authors provide a detailed and convincing discussion about the model results (comparison between modelled and simulated quantities).

C1

The manuscript describes an interesting application of the model HYPE but misses the main objective of the work. Assessment of model for flow and transport requires not only a good match between computed and measured variables but also: - A detailed description of the main processes involved in the model. The presentation of the main features is too short. - A more relevant analysis of the model performance which is also depending on the number of calibrated parameters. The criteria used in this work (NSE, Pearson's correlation coefficient, percent bias) are not relevant for model assessment. - Detailed analyses of the calibrated parameter sets, including an estimate of the parameter uncertainty and parameters correlation. - A discussion on eventual over-parameterization (especially in case of significant correlation between some parameters). - A much more detailed discussion on the data set which mixes different time and space scales and different measurement errors.

Therefore, I consider that the paper should not be accepted for publication in HESS.

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C2