Uncertainty analysis and evaluation of influencial factors in the performance of watershed models

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The rainfall-runoff models are no longer used purely for academic purposes but as a tool that supports the water resources management. In this expansion of scope, however, adequate consideration of its foundations and its limitations have not been widely discussed and incorporated in the application of its results in decision taking support. This research investigates the limitations surrounding modelling and points desirable procedures for the assessment of the models contours and its application. For that, uncertainties arising from parameters, structure and data modeling were performed with Soil and Water Assesment Tool - SWAT. The setting-up of these uncertainties incorporates the idea of equifinality of parameters giving the simulation results as a range of possible values instead a unique answer. For uncertainty and sensitivity analysis were applied PARASOL and LH-OAT algorithms, respectively, this procedure identified the uncertainties arising from the more sensitive parameters used in calibration. The research investigates the relationship between the uncertainties in the model, the nature of data and the parameters calibrated. The information content in the data is essential for obtaining good fit and identifying the most appropriate parameter values. The calibration of most sensitive parameters working on getting a good response surface and the success in optimization process. Data evaluation and applying a suitable calibration method is crucial for a consistent uncertainty analysis of the model and the success of the modelling.