



How different likelihood measures play a role in studying the uncertainty in the rainfall-runoff modelling of a mediterranean catchment

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A rainfall-runoff model, IHACRES, is employed for continuous daily simulation to reproduce the response of a Sicilian catchment. This model comprises two modules: a non linear loss model, to transform total rainfall in effective rainfall, which involves calculation of an index of catchment storage based upon a non-linear triggered exponentially decreasing weighting of precipitation and temperature; a linear convolution of effective rainfall with the total unit hydrograph with a configuration of one parallel channel and reservoir, corresponding to 'quick' and 'slow' components of runoff. The Generalised Likelihood Uncertainty Estimation (GLUE) approach is presented here as a tool for estimating the predictive uncertainty of the rainfall-runoff model. GLUE allows to recognise the possible equifinality of different parameter sets and assesses the likelihood of a parameter set being acceptable simulator when model predictions are compared to observed field data. The results of the GLUE methodology depend very much on the choice of likelihood measures used. Following these premises, this paper investigated on the effect of different likelihood measures on the uncertainty analysis in the rainfall-runoff modelling of a mediterranean catchment and on the criteria of rejecting simulations on the basis of such measures and the number of behavioural simulations.