Assessing the potential accuracy of hydrologic rainfall-runoff models

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In recent years, major interest has been growing around the assessment of "models' reliability". Recognition of the importance of using models in a more aware way, gives a double advantage: users are conscious of not having a "perfect" tool and, by knowing its strengths and weak points, they can use it at its best. When modelling hydrologic systems, one might recognize that they present a small observability, at least with reference to classical measurements. This, together with the imprecision of the observations available for calibration (e.g., rainfall and discharge), hampers model's accuracy when used in forecasting mode. Finally, model accuracy is non linearly linked to model's parameters calibration.

To estimate the potential accuracy of a rainfall-runoff model, a synthetic experiment is here proposed. In the experiment, parameter sets able to give consistent outputs are derived. The accuracy in their estimation is assumed to be a function of the number of both rainfall events and hydrograph points available for calibration. The influence of parameters calibration on the overall accuracy of model forecasts is analyzed and discussed. Since an ensemble of model's runs is used, this approach can be extended to different hydrologic models.