Assessing the impact of updating approaches of the performances on a real-time flood forecasting model: a study on 178 French catchments

L. Berthet, V. Andréassian, and C. Perrin

Cemagref, HBAN, Antony Cedex, France (lionel.berthet@cemagref.fr)

We present the comparison of performances obtained by a real-time operational rainfall-runoff model running with different updating methods based on the assimilation of past observed streamflow data. The tested updating techniques are: (i) direct state updating, (ii) parameter updating and (iii) output updating (various methods ranging from simple regressions to ARIMA models and artificial neural network (ANN) approach). The comparison is drawn over a large sample of 178 French catchments encompassing the hydroclimatic variability of the country.

The model is a continuous one, specifically designed to be run in 'forecasting' mode.

We study specifically the impact of the updating method on model performance. Characteristic times of the updating techniques are defined and then compared to characteristic times of the model, the catchment and to the desired lead times.

This approach helps to understand when and where a given updating technique is appropriate. The comparison gives results we believe useful for operational forecaster to choose their real-time flood forecasting system.