



Post-processing of medium-range ensemble hydrological forecasting: impact of forcing, initial conditions and model errors

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The impact of errors in the forcing, errors in the model structure and parameters, and errors in the initial conditions are investigated in a simple hydrological ensemble prediction system. The hydrological model is forced by precipitation forecasts from the ECMWF Ensemble Prediction System. The post-processing of the precipitation and/or the streamflow using information from the reforecasts performed by ECMWF are tested. For this purpose, hydrological reforecasts are obtained by forcing the hydrological model with the precipitation from the reforecast data.

In the present case study, it is found that the post-processing of the hydrological ensembles with a statistical model fitted on the hydrological reforecasts improves the verification scores better than the use of post-processed precipitation ensembles. In the case of large biases in the precipitation, combining the post-processing of both precipitation and streamflow allows for further improvements. During winter, errors in the initial conditions have a larger impact on the scores than errors in the model structure as designed in the experiments. Errors in the parameter values are largely corrected with the post-processing.