



Ensemble approach for hydrological forecasting in ungauged catchments

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This study focuses on the application of ensemble approaches to forecast flows in ungauged catchments. The aim is to study the best strategy to search for information in gauged "donor" basins and to transfer it to the ungauged site. We investigate what information is needed to set up a rainfall-runoff model and to perform forecast updating in real time. These two components of a flood forecasting system are thus decoupled in our approach. The methodology adopted integrates the scenarios of regional transfer of information and the scenarios of ensemble weather forecasting together in a forecasting system. The approach of ensemble forecasting is thus generalised to the particular case of hydrological forecasting in ungauged basins. The study is based on 211 catchments in France and on an archive of about 4.5 years of ensemble forecasts of rainfall, which are used for hydrological modelling on a daily time step. Flow forecasts are evaluated with special attention paid to the attributes of reliability and accuracy of the forecasts. The results show that forecast reliability in ungauged sites can be improved by using several sets of parameters from neighbour catchments, while forecast accuracy is improved with the transfer of updating information from gauged neighbour catchments.