Multi-step ahead streamflow forecasting for the operation of hydropower reservoirs

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Multi-step ahead forecasting is of practical interest for the operation of hydropower reservoirs. We conduct several large scale simulation experiments using both streamflow data and simulated time series to provide generalized results concerning the variation over time of the error values in multi-step ahead forecasting. In more detail, we apply several popular forecasting methods to each time series as explained subsequently. Each time series is split into a fitting and a testing set. We fit the models to the former set and we test their forecasting performance in the latter set. Lastly, we compute the error and the absolute error at each time step of the forecast horizon for each test and carry out a statistical analysis on the formed data sets. Furthermore, we perform a sensitivity analysis on the length of the fitting set to examine how it affects the results.