



Multivariable data assimilation over Pan European river basins

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In this study we evaluate setup of a data assimilation framework for the mesoscale hydrologic model (mHM 5.2, <http://www.ufz.de/mhm>) and the multiscale parameter regionalization (MPR) technique. We implement particle filtering for appropriate initialization of model states. The analysis is carried out within 7 large European basins of distinct climate characteristics. Hydrologic model development and evaluation does not only focus on the simulated streamflow (model output), but also on other key land surface variables. The mHM is being constrained by a range of other variables available at different spatial scales: GRACE terrestrial water storage content ($1^\circ \times 1^\circ$ resolution) and ESA soil moisture product ($0.25^\circ \times 0.25^\circ$ resolution). Initial results shows that data assimilation based on complementary data sets leads to slight deterioration in streamflow performance, however, this loss is balanced by improved simulation of other model states and fluxes. This becomes beneficial especially during the forecast applications, for which correct model initialization is crucial. –