Evaluation of a probabilistic hydrometeorological forecast system

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Medium range hydrological forecasts in mesoscale catchments are only possible with the use of hydrological models driven by meteorological forecasts, which in particular contribute quantitative precipitation forecasts (QPF). QPFs are accompanied by large uncer tainties, especially for longer lead times, which are propagated within the hydrometeorological model system. To deal with this limitation of predictability, a probabilistic forecasting system is tested, which is based on a hydrological-meteorological ensemble prediction system. The meteorological component of the system is the operational limited-area ensemble prediction system COSMO-LEPS that downscales the global ECMWF ensemble to a horizontal resolution of 10 km, while the hydrological component is based on the semi-distributed hydrological model PREVAH with a spatial
resolution of 500 m.

Earlier studies have mostly addressed the potential benefits of hydrometeorological ensemble systems in short case studies. Here we present an analysis of hydrological ensemble hindcasts for two years (2005 and 2006). It is shown that the ensemble covers the uncertainty during different weather situations with an appropriate spread-skill relationship. The ensemble also shows advantages over a corresponding deterministic forecast, even under consideration of an artificial spread.