Linking observational evidence with hydrologic model simulations in a small experimental catchment

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Exploring hydrologic process patterns on small catchments provide a way to better understand the overall catchment behaviour. The objective of this study is to investigate the added value of different sources of data, i.e. eddy covariance measurements of evapotranspiration, soil moisture from spatially distributed network, time lapse photography of snow cover and overland flow, and satellite observation of snow cover, soil moisture and evapotranspiration, for predicting runoff in small ungauged basins. The analysis will be performed in the Hydrological Open Air Laboratory (HOAL) in Austria, a 66 ha experimental catchment (Blöschl et al., 2016). A conceptual, HBV type, spatially lumped hydrologic model will be evaluated on daily and seasonal time scales, in terms of how well the model simulates streamflow if no streamflow is used for model calibration, overland flow, evapotranspiration, and soil moisture. A cross-validation will be performed using a 22-year-long period when only streamflow measurements, and two 2-year-long periods when streamflow measurements and additional sources of data (snow cover, overland flow, soil moisture and actual evapotranspiration) are available. Runoff will be predicted by using only measurements of soil moisture, actual evapotranspiration and a combination of these. The study will discuss and compare the results for the different variants.

Reference:
Blöschl, G., et al. (2016). The Hydrological Open Air Laboratory (HOAL) in Petzenkirchen: A hypothesis-driven observatory. Hydrol. Earth Syst. Sci., 20(1), 227–255. doi: 10.5194/hess-20-227-2016.