



Capturing heterogeneity: The role of a study area's extent for estimating net precipitation

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Accurate and precise estimates of net precipitation are required for many hydrological applications. For instance, most interception models require high quality estimates of the canopy storage capacity and the free throughfall coefficient. Good estimates of these parameters, in turn, critically depend on the quality of throughfall estimates. Previous attempts to guide throughfall sampling focused on the selection of an appropriate sample size, support, and sampling design. Comparatively little attention has been given to the role of the extent, i.e. the size of the area under study. In this contribution we investigate the influence of the extent on the representativeness of mean throughfall estimates for simply structured and heterogeneous forest ecosystems. We based our investigation on stochastic simulations which we derived from large empirical throughfall datasets. Using the simulated throughfall fields, we conducted virtual sampling experiments using a number of typical extents. We ran these tests both for a range of event sizes and for accumulated data. Our findings suggest that the size of the study area should be carefully adapted to the required temporal resolution of the throughfall data (i.e. event-based versus long-term) and to the complexity of the system under study.