



## **Estimating canopy water storage capacity: What do we really know?**

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The canopy water storage capacity - the amount of water which is retained in the canopy - is an important parameter of many interception models. Furthermore, recent research indicates that even continental-scale hydrological models can be sensitive to this parameter. Surprisingly, however, there is no standard method to estimate the canopy capacity. Instead, several methods coexist and the multitude of individual decisions involved in their application suggests that the calculation of the canopy capacity might be associated with substantial uncertainty. This problem motivated us to systematically assess several methods for the estimation of the canopy capacity for two forest stands: a 5-year old and a more than 130-year old secondary forest. Both forests differ greatly with respect to canopy structure and we can expect that these differences are reflected in the estimates of canopy capacities. In our analyses we compare the results of four different canopy capacity estimation methods and explore the consequences of several common decisions involved in calculating canopy capacities. We base our calculations on event-based throughfall and rainfall data. For each rain event and at each forest site we use data from 200 throughfall sampling points which were distributed randomly over a 1 ha area. Our preliminary results seem to corroborate the supposition that canopy capacities vary widely depending on the applied method. Given the application of high-quality throughfall datasets, the tested methods permitted the detection of differences in canopy capacities between the two contrasting forest stands. Yet, results of individual methods varied so widely that comparisons of canopy capacity estimates obtained with different methods seem to be problematic. Our results further indicate that some methods cannot cope with data containing drip points, which points at their limited physical basis.