Project Database of ICP Forests
PROJECT DESCRIPTION

PROJECT INFORMATION

Project title: stemflow site comparison

Project ID: 11

Contact person: Dr. Sonja Germer

PROJECT DESCRIPTION

As rainfall passes through canopies water is redistributed spatially and reaches the soil as throughfall and stemflow. Stemflow can account for more than 10% of incident rainfall for different vegetation types in tropical, temperate, semi-arid and arid regions even though their trees basal area occupies a comparatively small fraction of total forest area. Stemflow percentage of incident rainfall varies, however, widely for different forests of the same tree species. Stemflow studies from European beech forests report stemflow percentages in a range from 3% up to 25%. The few studies including more than one year of stemflow records also mentioned high inter-annual variability of stemflow per forest stand. This study aims at assessing the drivers of stemflow percentage variability between different forest sites of the same species and the temporal variability of single forests and individual trees. For this we are compiling data of beech, oak and pine stemflow from several European countries together with the respective rainfall data and forest parameters. The compilation will include studies with a high quantity of sampled individuals (up to 20 trees) as well as studies with single individuals but long-term data collection (>10 years). We expect that compared to throughfall sampling, the stemflow sampling device design seems to have little influence on estimated stemflow per forest. What matters beside forest characteristics, are probably rather the sample size and the respective year of sampling. On an annual basis, the funneling ratio (stemflow divided by the product of rainfall and trunk basal area) seems to be a good parameter for stemflow estimation. In our preliminary data analysis we found, however, an increased variability of the funneling ratio for seasonal data (leaved and leafless periods). Even though -stemflow can account for a great share of total canopy water flux, the processes in terms of temporal and site specific variability are far from being well understood. Accurate stemflow and throughfall estimations are, however, a perquisite for forest canopy interception and evaporation estimates.

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For further information please contact the Programme Coordinating Centre (PCC) of ICP Forests
pcc-icpforests@ti.bund.de