



Adjustment to rainfall measurement undercatch with a tippingbucket rain gauge using ground-level manual gauges

Svatopluk Matula, Getu Bekere Mekonnen, Frantisek Dolezal, and Jaroslav Fisak
Czech University of Life Sci, Prague, CZ, Water Resources, Prague, Czech Republic (Matula@af.czu.cz)

Wind-caused undercatch is an important factor among types of systematic errors in point measurements of rainfall. The daily amount of rainfall measured by a MR3H tipping-bucket rain gauge (TBR-MR3H), which is elevated above the ground surface, was considerably underestimated on average by 46 % when compared with the corresponding measurements done by a pair of ground-level manual gauges (M-Rs). The undercatch was also confirmed by the measurements using a set of microlysimeters (MLs). The daily rainfall totals measured by the manual rain gauge were used as a reference in adjusting the rainfall undercatch with the tipping-bucket rain gauge. A simplified equation, developed based on the relationship between logarithmic wind profile and its effect on the catch ratio (CR) of the two gauges, was used to calculate the correction factor on a daily basis. The effect of wind speed depends on the intensity of rainfall. Parameters were optimized, and the proposed equation was validated. The calculated and measured daily rainfall amounts were in good agreement with a correlation coefficient of 0.99, and overall deviation of 0.04.