

## Quantifying stemflow to better express its ecohydrological significance

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Stemflow is the flow of rainwater over the exterior of a tree stem to its base. Due to water balance calculations to obtain interception loss of forest stands, and the sometimes low percentage of stemflow as a function of rainfall, some literature ignores the ecohydrological significance of stemflow. However, stemflow is much more concentrated than throughfall per unit area. In recognition of the extreme amounts of water input to the small area around tree trunks, we advocate for two metrics to better express stemflow in relation to its ecohydrological importance: namely, the stand-scale funneling ratio and the stand-scale infiltration funneling ratio. We calculated these metrics based on measurements carried out in a tropical dry deciduous forest and a subpolar juvenile coniferous stand, and found that these are significantly larger than throughfall on both sites. The data cited from recent papers ( $n=34$ ) showed that very small stand-scale amount of stemflow (approximately 0.5% on average) were necessary to make the stand-scale funneling ratio to be equal or more than unity. Moreover, the infiltration area of stemflow is generally  $< 0.2 \text{ m}^2$  due to the high infiltration capacity of top soil of forests, generally resulting in the stand-scale infiltration funneling ratio substantially greater than unity. Thus, stemflow is more effective for soil water recharge than throughfall. We recommend use of these metrics to better express ecohydrological importance of stemflow.

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