



Soil water content spatial and temporal variability around a tree. The role of stemflow.

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Rainfall redistributed in forest ecosystems by throughfall and stemflow implies a large degree of temporal and spatial soil water inputs variability, affecting both tree water uptake and deep percolation. In this sense, stemflow, although being a small proportion of rainfall compared to throughfall, is recognized an important hotspot concentrating water close to root systems.

This work studies the soil water content spatial and temporal variability around a Scots pine tree growing within a forest in a Mediterranean mountainous area (Vallcebre Research catchments, NE Spain). The main objective is to investigate the role of stemflow as a hotspot input of water into the soil. The monitoring started on December 2017 and consists of a set of 68 automatic TDR probes covering a Scots pine tree canopy projected area of about 13 m². Stemflow production of the monitored tree was formerly studied.

Two complementary designs, trying to cope with the soil water content variability in surface and depth, were established: (a) 40 TDR probes (0-30 cm depth) were distributed in 8 radii around the tree at 10, 20, 50, 100 and 200 cm from the trunk. (b) Eight soil profiles (0-90cm), were located in four of the radii formerly described, one at 10cm and the other at 100 cm from the trunk.

This work presents the first results describing the soil water content variability around the tree and its dependency on tree structure, distance to tree trunk, stemflow and throughfall inputs, as well as meteorological and soil characteristics.