Geophysical Research Abstracts
Vol. 17, EGU2015-10285, 2015
EGU General Assembly 2015

Flow patterns of precipitation and soil water beneath forest canopies: An experimental approach to assessing water flow heterogeneity with high resolution measurements.

Johanna Clara Metzger (1,2), Nicolas Dalla Valle (2), Thomas Wutzler (2), Janett Filipzik (1), Christoph Grauer (1), Danny Schelhorn (1), Josef Weckmüller (1), Anke Hildebrandt (1,2)

(1) Institute of Geosciences, Friedrich-Schiller-University, Jena, Germany (johanna.clara.metzger@uni-jena.de), (2) Max Planck Institute for Biogeochemistry, Jena, Germany

Due to the mechanisms of interception, stemflow and canopy throughfall, precipitation reaches a forest soil surface in an altered temporal and spatial distribution. It is characterized by a strong heterogeneity. The retention of water by canopies is contrasted by the formation of dynamic hotspots, which channel rain water down to the soil: canopy dripping points and stemflow.
This poster introduces a new experimental site established within the collaborative research center of AquaDiva, where we aim to investigate the flow paths of water from the top of the canopy through the soil below the main rooting zone in an intensive field study.
The study site, sized one hectare, is located in Thuringia in an unmanaged Central European beech forest on limestone, and complemented by measurements in an adjacent grassland site. A soil moisture sensor network (SoilNet) has been established for monitoring soil water content at high temporal (3 min interval) and spatial (420 sensors per ha) resolution. During field campaigns in spring and early summer, the spatial distribution of net precipitation is measured. Vegetation properties and soil physical and scientific characteristics have been surveyed.
Using this setup, we plan to determine, whether and during which conditions spatial patterns of net precipitation persist in soil moisture and fluxes. Using the high-resolution soil water content data we aim to discover flow dynamics and thus identify preferential flow paths in the soil. Geostatistical analysis will yield information about spatial distribution and the relationship of above- and subsurface flow patterns and impact factors.
In this poster we will present first results of net precipitation composition and statistical characteristics of throughfall and soil moisture data.