



## **Water movement in stony soils: The influence of stoniness on soil water content profiles**

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### **WATER MOVEMENT IN STONY SOILS: THE INFLUENCE OF STONINESS ON SOIL WATER CONTENT PROFILES**

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Soils containing rock fragments are widespread over the world, on Europe such soil account for 30%, 60% in Mediterranean region. In comparison to fine earth soils (soil particles are less than 2 mm) stony soils contain rock fragments characterized by the low retention capacity and hydraulic conductivity. So, for stony soils –in comparison to the fine–earth soils - is typical lower hydraulic conductivity and retention capacity, which lead to the decrease decrease of infiltration rate and low water retention. So, water movement and its modeling in stony soil would differ from fine earth (usually agricultural) soil. The aim of this contribution is to demonstrate the differences in water movement in homogeneous soil (fine earth) and stony soil. The influence of different stoniness on soil water content and soil water dynamics was studied too.

Windthrow at High Tatras mountains in Slovakia (November 2004) cleared nearly 12 000 ha of 80 year conifers and this event initiated complex research of windthrow impact on the ecosystem. The important part of this study was water movement in impacted area. Specific feature of the soil in this area was moraine soil consisting of fine earth, characterized as silty sand, with the relative stone content up to 0.49, increasing with depth.

Associated phenomenon to the forest clearing is the decrease of rain interception and higher undercanopy precipitation. Conifers interception capacity can be three times higher than low canopy interception, and can reach up to 40% of annual precipitation in Central Europe. Stones in the soil are decreasing infiltration rate, but paradoxically increased understorey precipitation and followingly the increased cumulative infiltration led to the increase of the soil water content of the upper 1 meter soil layer up to 53 mm at the end of vegetation period in comparison to the afforested area.

Finally, soil water content profiles of stony soil differ from homogeneous ones and contain less water comparing to soil without stones.