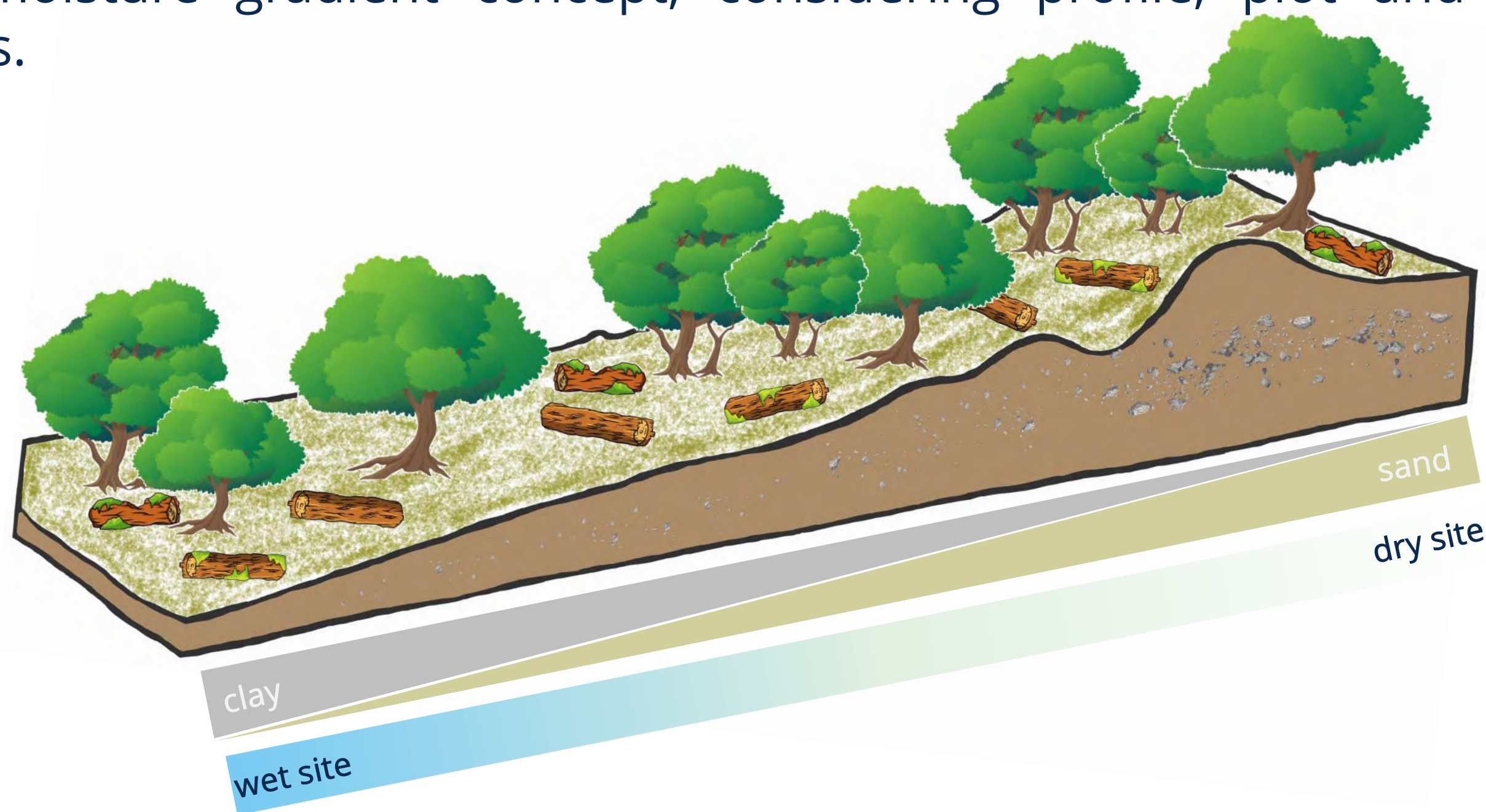


Spatio-temporal distribution of soil moisture conditions along a terminal moraine using two experimental plots in a near-natural beech forest

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Background A higher amount of deadwood in natural beech forests contributes to better chances of tree survival as the probability of long dry periods increases. Interactions between available soil water, deadwood, living trees with their rooting systems, and soil carbon (C) storage are poorly understood. Therefore, the recently started Beneath project is dedicated to intensive monitoring and analysis of soil moisture dynamics and its influence on water and C cycles in that forest ecosystem. Near-natural beech forest was instrumented according to the moisture gradient concept, considering profile, plot and stand scales.



Experimental design Two experimental plots were designed based on factors controlling the soil moisture in forest ecosystem: № 1. **Along the rooting system** describes the variation of soil water content (SWC) from near stem to away from stem; № 2. **Under deadwood** records the soil moisture distribution below the deadwood, depending on decay class (I – intact; II – slightly decayed; III – strongly decayed).

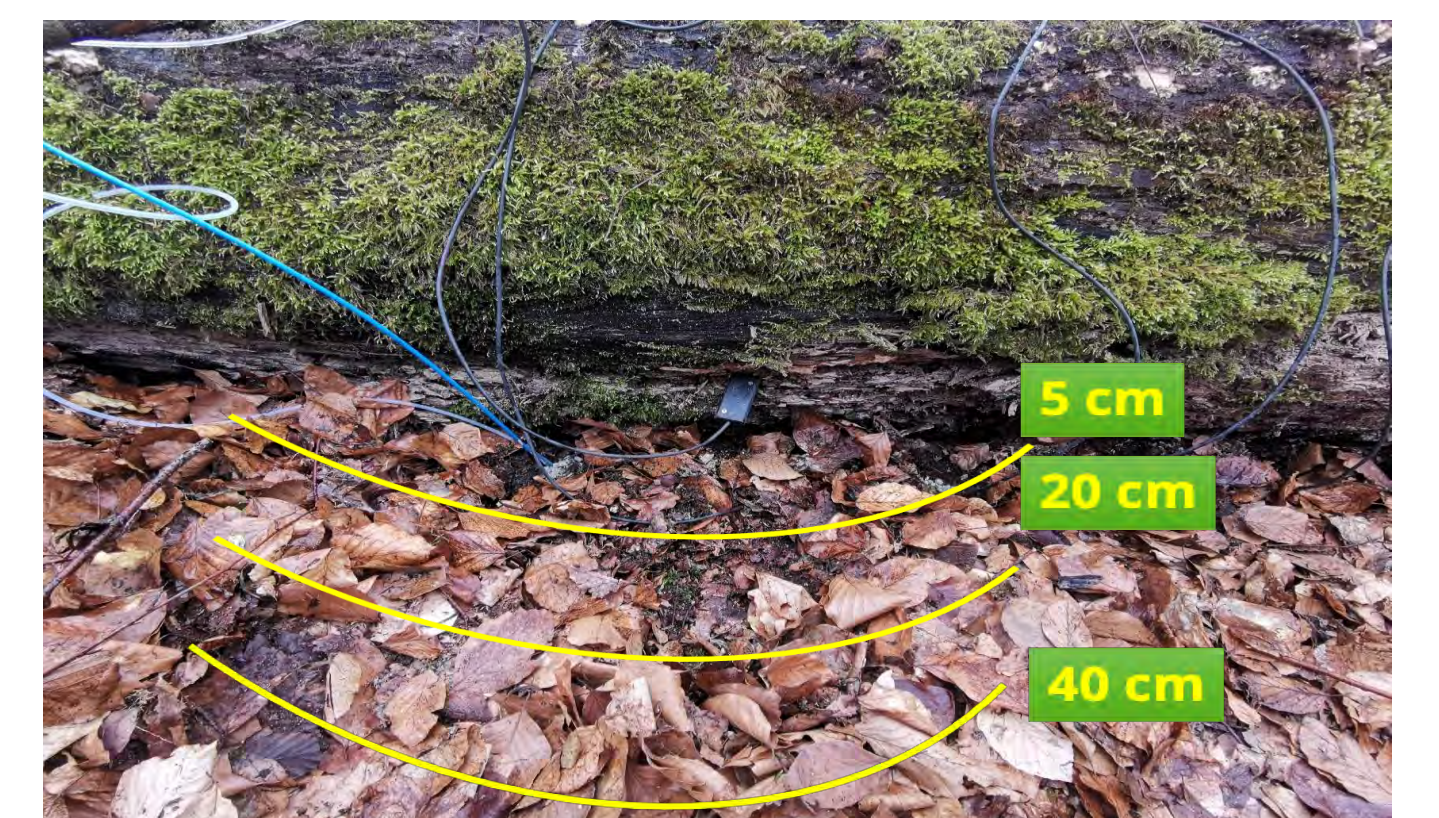
Along the rooting system



Study site along a slope of a terminal moraine

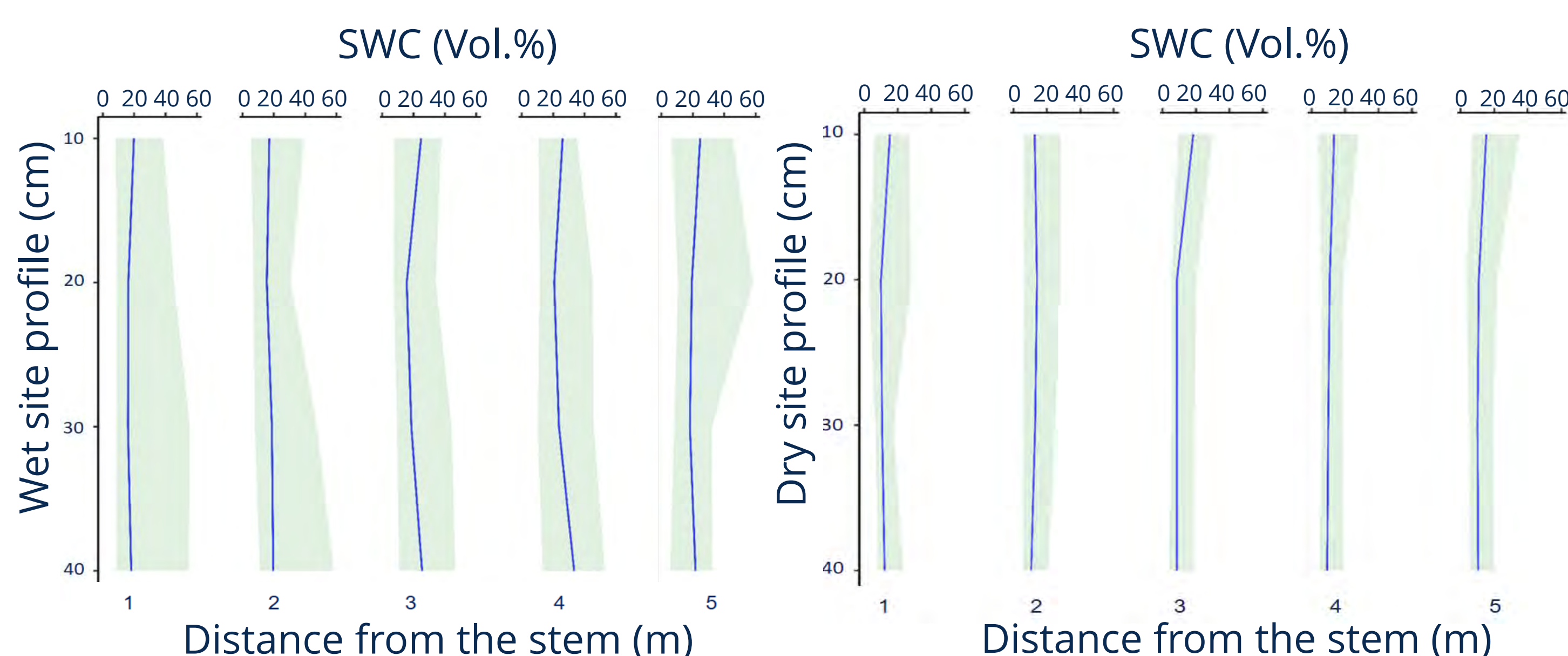


Plot № 1. Along the rooting system of the tree

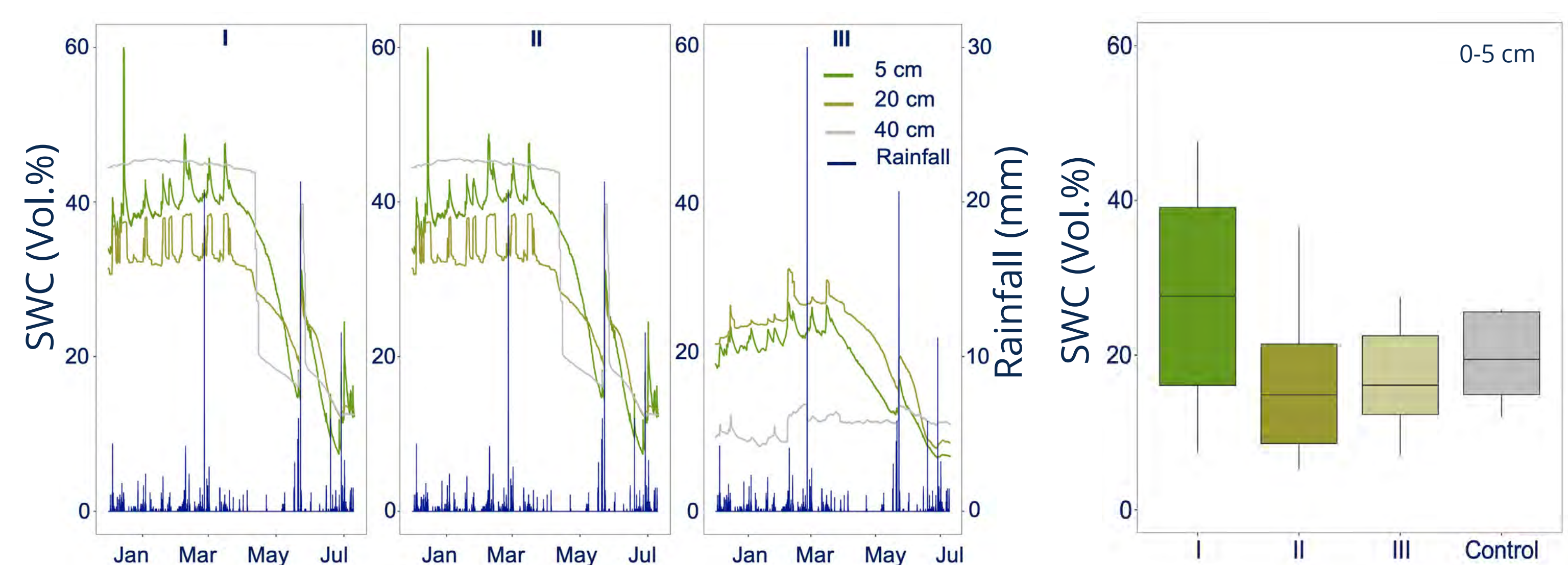
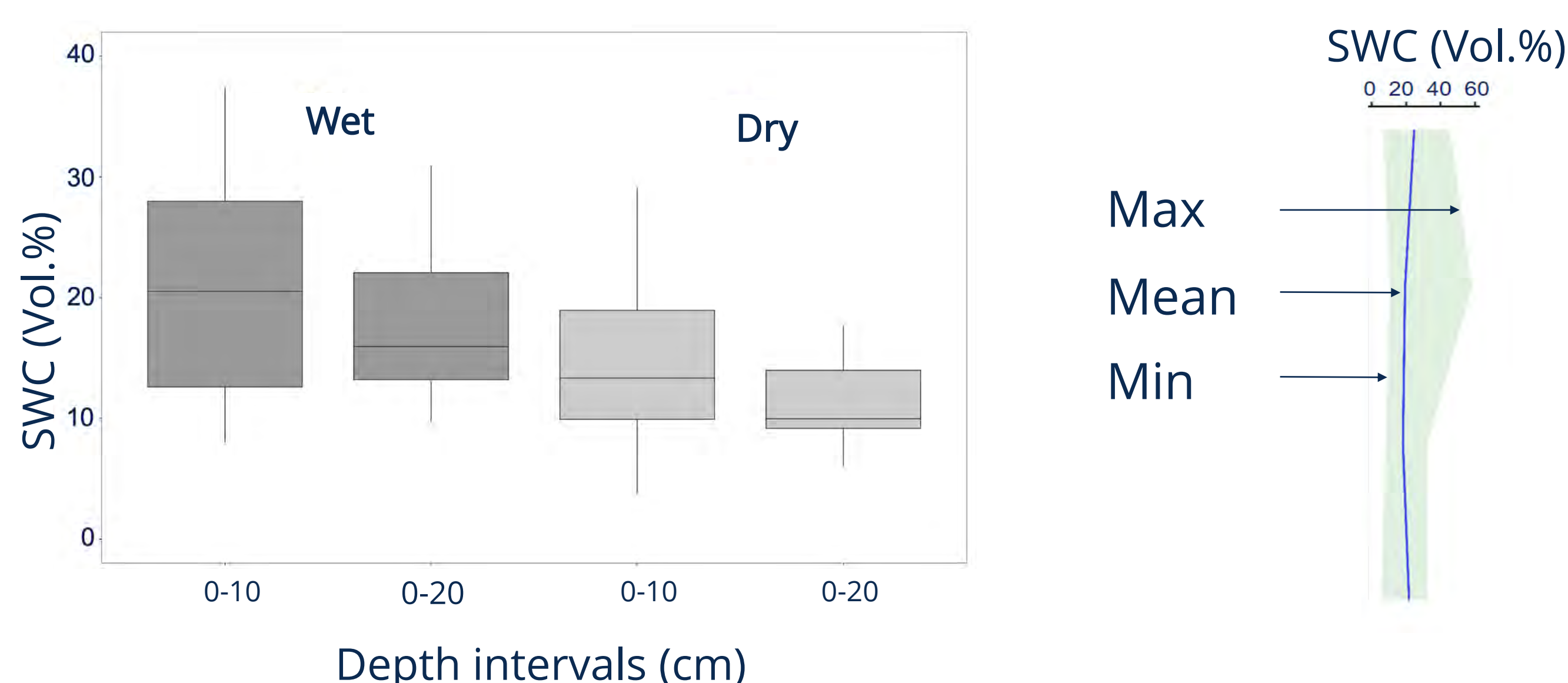


Plot № 2. Under deadwood

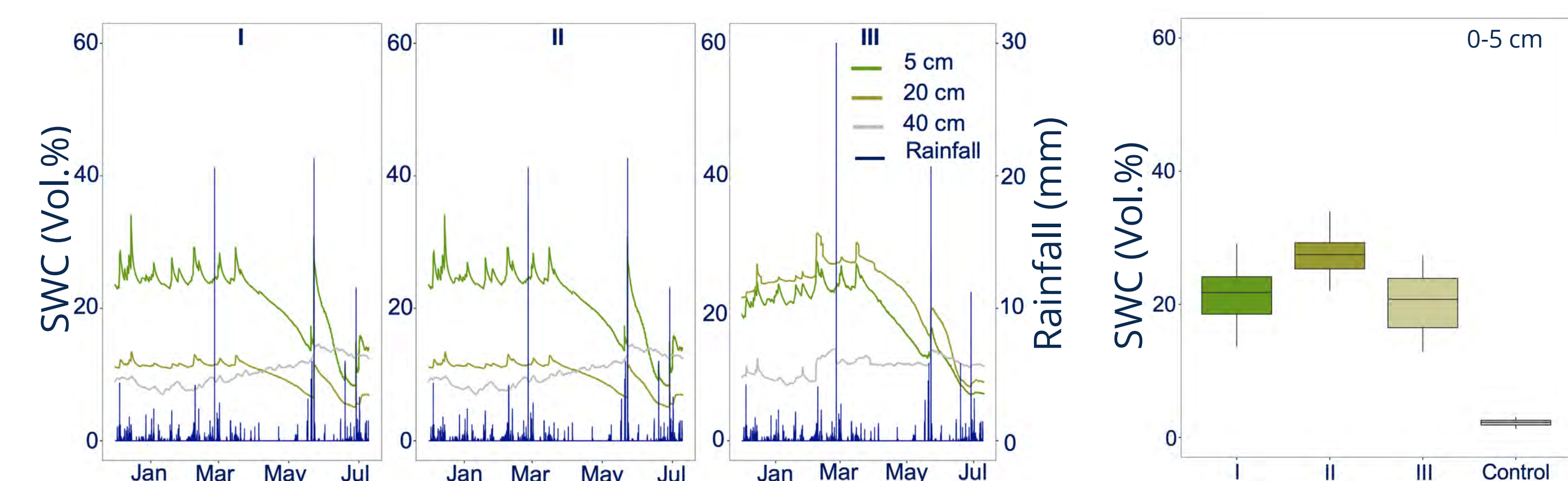
Under deadwood



Variation of mean SWC from near stem at (1 m) to away from stem (5 m) measured between 28.03. and 28.07.2023



Mean SWC under deadwood of three different decay classes (I, II, III) on the **wet site** in 2023



Mean SWC under deadwood of three different decay classes (I, II, III) on the **dry site** in 2023

- The variation of the soil moisture along the rooting system is stronger on the wet site than on the dry
- At both sites the most pronounced effects of soil moisture ranges was observed in the depth intervals 0-10 cm and 0-20 cm

- Decay class of the deadwood plays a controlling role in the vertical soil moisture distribution: I > II > III
- Observation of the SWC at depth intervals > 20 cm posses homogeneous variation in 2023



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