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## Dynamics of spatial and temporal outflow from a soil column influenced by earthworm activity

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Earthworms are known as ecosystem engineers, which influence the chemical and physical properties in their own environment and thereby strongly modify soil processes. Soil structure (soil aggregates and macropores) formed by earthworms during burrowing activity may influence the soil moisture retention and water flow, enhancing infiltration into deep soil layers.

We will study the influence of anecic earthworms (*Lumbricus terrestris* fed on poplar leaves) on the spatial and temporal variability in water outflow and storage through a soil column. Therefore, we established a cylinder (30cm diameter, 50cm high) with silty loamy soil. At the bottom boundary, 15 fiberglass wicks drain the water from the soil column. With these wicks, the water outflow is measured with a spatial and temporal resolution. After an initial wetting of the soil (), [LVS1] irrigation of the soil cylinder takes place twice per week with a full cone nozzle, with an intensity of 40 mm/h and a duration of 10 minutes. The research design consists of three phases (i) soil-filled column (4 weeks) (ii) transition phase: initial earthworm activity (4 weeks) (iii) soil column with earthworm created structure (4 weeks).

We expect the outflow of water from the soil column to change due to the earthworm activity: on the one hand, the creation of macroaggregates is expected to increase the water retention in the soil and on the other hand, the macropores are expected to create a spatial variability in outflow and a more rapid reaction of outflow to the irrigation events.