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# Moisture dynamics of urban soils – INTERURBAN

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Urban soils are subject to strong variations of environmental conditions, like in water flow, solute transport or heat budget. The research project INTERURBAN has been formed to investigate the dynamics of water and solutes at urban locations with particular attention to the spatial heterogeneity, the organic soil substance and soil-biological transformation processes in the unsaturated zone. The objectives of INTERURBAN define also the tasks for geophysics: The development of a noninvasive conception to map water distribution, water dynamics and important physical parameters on small scales. This contribution focuses on the monitoring of soil moisture using high resolution DC geoelectrics. In order to monitor long and short term changes of the electrical resistivity due to soil moisture variations two permanent electrode in-line arrays were installed. Each array consists of 50 electrodes with an electrode spacing of 0.2 m. This spacing was chosen to acquire an overview of the anomalous areas with the option of a future spacing decrease to allow higher spatial resolution. We started to monitor long term dynamics of the electrical resistivity in 2002 using Wenner configuration.

Performing monitoring of the long term dynamics of the water content of the shallow subsurface, single meteorological events can mask the global trend, when the time resolution is not sufficient. The short term monitoring shows promising results in determining the water flow as well as detecting hydrophobic areas. Apparently preferential flow paths can be identified by focusing on measuring the short term dynamics. Wet and dry areas correlate to hydrophilic and water repellent structures respectively. Due to the strong heterogeneity of urban soils these areas are in the range of only a few decimeters. Current work includes IP and SIP measurements with a higher spatial and time resolution as well as an integrated calibration with laboratory data to lead to an unified approach for a noninvasive geophysical exploration of soils. The results may be used also to evaluate the water retention potential.