



Groundwater recharge measurements in gravel sandy sediments with monolith lysimeter

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Ljubljana field aquifer is recharging through precipitation and the river Sava, which has the snow-rain flow regime. The sediments of the aquifer have high permeability and create fast flow as well as high regeneration of the dynamic reserves of the Ljubljana field groundwater resource. Groundwater recharge is vulnerable to climate change and it is very important for drinking water supply management. Water stored in the soil and less permeable layers is important for water availability under extreme weather conditions. Measurements of water percolation through the vadose zone provide important input for groundwater recharge assessment and estimation of contaminant migration from land surface to the groundwater. Knowledge of the processes governing groundwater recharge in the vadose zone is critical to understanding the overall hydrological cycle and quantifying the links between land uses and groundwater quantity and quality.

To improve the knowledge on water balance for Ljubljana field aquifer we establish a lysimeter for measurements of processes in unsaturated zone in well Kleče. The type of lysimeter is a scientific lysimeter designed to solve the water balance equation by measuring the mass of the lysimeter monolith as well as that of outflow tank with high accuracy and high temporal resolution.

We evaluated short period data, however the chosen month demonstrates weather extremes of the local climate – relatively dry periods, followed by high precipitation amount. In time of high water usage of vegetation only subsequent substantial precipitation events directly results in water flow towards lower layers. At the same time, gravelly layers of the deeper parts of the unsaturated zone have little or no capacity for water retention, and in the event that water line leaves top soil, water flow moves downwards fairly quickly. On one hand this confirms high recharge capacity of Ljubljana field aquifer from precipitation on green areas; on the other hand it shows tremendous susceptibility of the aquifer to pollution and reinforces the position of groundwater protection zones above aquifer.