Continuous Measurement of Water and Solute Fluxes in Soil. (S01-masarik14448-Poster)

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Abstract:

Evaluating the impact of land use practices on ground water quality has been difficult because no techniques are capable of monitoring the quality and quantity of soil water flow below the root zone without affecting the flow process. A recently introduced method, known as equilibrium tension lysimetry, was a major improvement but was not a true equilibrium since it required manual intervention to maintain proper suction. We addressed this issue by developing an automated equilibrium tension lysimeter system (AETL) that continuously matches lysimeter tension to water potential of the soil. The water potential of the bulk soil is measured with a heat dissipation sensor (HDS), while a small DC pump applied suction to the lysimeter. The automated approach was operated for a twelve-month period. Powered by a 12 V rechargeable battery the AETLs were able to operate effectively for twoweek periods with minimal human attention, along with the added benefit of collecting continuous soil-water potential data. We also demonstrated, in the laboratory, methods for continuous measurement of water depth in the AETL, a capability that makes them true water flux meters.

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