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Measure the invisible water

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Measure the invisible water (evapotranspiration)
Rain and snow can be seen, but this is not the greatest amount of water loss from virtually all areas in the world: evapotranspiration. Reliable figures are lacking on this invisible water loss largely because evaporation is so difficult to measure.

Evapotranspiration measuring versus modelled data
The west-Netherlands water board Rijnland monitors and controls clean and healthy water for more than 1.3 million people. In May 2017 at 3 locations Lysimeter stations are installed measuring real evapotranspiration. The water board is taking a lead by using measured evapotranspiration besides calculated modelled data.
Accurate measurements of evapotranspiration can be obtained from advanced hydrometeorological equipment or from direct measurements of water content changes in the soil. The first type of measurements have as a disadvantage that the representative area of the measurement changes according to wind speed, wind direction and land use. This disadvantage does not count for direct measurements of soil moisture change. The most accurate way of measuring soil moisture content change is by weighing a representative soil column with high frequency.

The Smart Lysimeter
A new Lysimeter provides these measurements, by using a system of weighing cells to measure water content changes and sensors to mimic the surrounding soil water conditions in an isolated undisturbed soil column. In this way accurate data on the soil water content and water fluxes (including evapotranspiration and groundwater recharge) are obtained. By installing additional sensors, extra information can be gathered on vertical gradients of soil moisture, matric potential, temperature and electrical conductivity. The use of a telemetric system provides a high temporal sampling resolution.

Cooperation in development
The development of the Smart Lysimeter is co-financed with funding from the of the Dutch Ministry of Economic Affairs. Projectpartners are KWR, Alterra, Vitens, KNMI, De Hoge Veluwe National Park, Province Gelderland, STOWA and Eijkelkamp Soil & Water.

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