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Is it possible to identify the recharge signature in head observations using times series analysis?

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Historically, the frequency of head measurements varies somewhere between twice a year and twice a month. Development and application of small instruments with pressure transducers, data loggers and easy-to-use software has lead to a significant increase in measurement frequency. Measured head fluctuations are commonly the result of multiple stresses, including rainfall, evaporation, pumping, and variations in surface water levels. Time series analysis may be applied to unravel the measured head fluctuations and identify which part of the fluctuation is caused by which stress. The contribution of rainfall and evaporation to the total head fluctuation is often significant. The unsaturated zone plays an insignificant role in the analysis when the water table is shallow, but plays a major role when the unsaturated zone is thicker. This presentation will show results of time series analysis for aquifers with a thin unsaturated zone and with a thicker unsaturated zone, both in humid climates. The analysis will be used to identify the part of the head fluctuation caused by rainfall and evaporation, and it will be attempted to use this information to estimate the areal recharge.