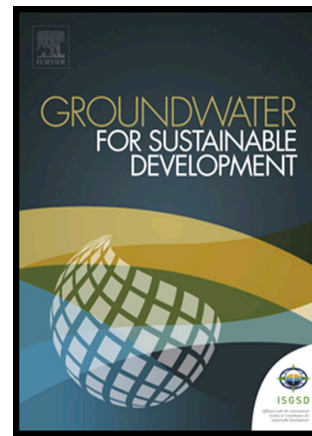


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# Understanding the groundwater-level fluctuations for better management of groundwater resource: a case in the Johannesburg region

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## Abstract

Successful management of groundwater resources depends on the available resource and degree of groundwater fluctuations. Fluctuation of groundwater-level is associated with both anthropogenic activities such as over pumping, and natural processes, primarily through reduction in recharge. It is difficult to identify the causes of fluctuations only by observing short-term water-level records. Therefore, the long-term groundwater-level records in the Johannesburg region were thoroughly analysed along with the results from the cumulative rainfall departure (CRD) method in order to understand the causes for the groundwater-level fluctuations in the mining region of Johannesburg. The CRD results confirmed that during wetter conditions, groundwater- levels become shallower. In the absence of correlation of groundwater-level variation with rainfall, groundwater abstraction was assumed as a possible cause for groundwater-level fluctuations.

Graphic abstract

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