Geophysical Research Abstracts
Vol. 21, EGU2019-3806, 2019
EGU General Assembly 2019

Using Flow Recession Method to Evaluate Catchment-Scale Hydrogeological Parameter

Chia-Chi Huang and Hsin-Fu Yeh

National Cheng Kung University, Department of Resources Engineering, Tainan City, Taiwan (hfyeh22@gmail.com)

The understanding of hydrogeological characteristics and groundwater flow processes in aquifers is crucial for the determination of sustainable groundwater resource development as well as hydrological management and planning. In the past, information on hydrogeological characteristics was mainly acquired through point field measurement such as borehole geophysical techniques and field aquifer hydraulic testing. However, in view of the cost limitations and scale applicability of these methods, low-flow recession analysis techniques that utilize streamflow data can be used as alternative low-cost methods to reversely back-calculate hydrogeological parameters based on the hydrological processes by which groundwater from aquifers is naturally discharged to rivers. We chose Southern Taiwan as the study area for the estimation of the recession index (K), which is representative of catchment discharge behavior during both the dry and wet seasons, to determine seasonal differences in the aquifer flow regime and to estimate the following three hydrogeological parameters: hydraulic conductivity (k), specific yield (Sy), and transmissivity (T). Based on the field test reports of the locations of groundwater observational wells on the Chianan and Pingtung plains, the study area was divided into the Chianan sub-area (Zengwun, Yanshui, and Erren river basins) and the Kaoping sub-area (Kaoping, Donggang, and Linbian river basins). The estimation results of the present study were compared to the field test results. The results showed significant differences in the recession index K between the dry and wet seasons. Slight differences between the estimated hydrogeological parameters and the field test results were also observed for the two sub-areas because of differences in scale. Furthermore, regional differences in the estimation results were found to be consistent with the distribution of geological structures, which indicates a high degree of feasibility in the application of flow recession methods for catchment-scale hydrogeological parameter determination.