

## Regional-Scale Groundwater Modeling in Montane Regions of Central Taiwan

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Effective management of groundwater requires the ability to predict subsurface flow and the response of fluid flux to changes in natural or human-induced stresses. Especially, the sustainable use of groundwater becomes more challenge under the increasing hydrological extreme events. Groundwater modeling may be the most popular way that can be used for analyzing subsurface flow in groundwater systems. This study proposed the regional-scale numerical modeling in montane regions of central Taiwan using the MODFLOW code which is one of the most popular and comprehensive deterministic groundwater models available. In-situ hydraulic properties using the high-resolution borehole acoustic televiewer and the double packer system in boreholes were adopted to establish the conceptual model for the regional-scale analysis. Transient and steady state analyses were carried out in this study for estimating the quantity of the recharge in regional scale. In addition, a technique of dividing the regional-scale problem into several small watersheds, as shown in Figure 1 was used to overcome the convergent problem in the analysis. The results from the numerical predictions and those obtained from other methods are similar. Results demonstrate that the modeling strategy for establishing the conceptual model may provide a useful tool for modeling the regional-scale problem in montane regions.

Keywords: Regional scale; Numerical modeling; MODFLOW; Groundwater; Montane regions.

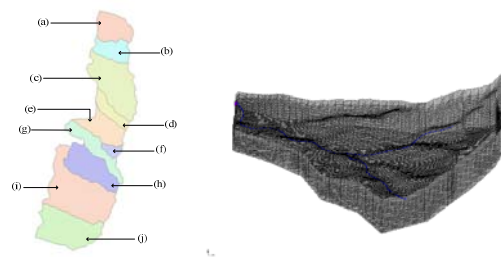


Figure 1. The conceptual model and the 3-D grid of watershed (f) for the regional-scale problem.