

Seasonal Assessment of Subsurface Water Resources by Using Surface and Groundwater Coupled Model

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Rainfall distribution of Taiwan is characterized as non-uniform in time and space. The slope of main rivers in the majority watershed is also very steep. That results in the watersheds become very difficult to store rain water, and to efficiently use water resource is getting severe. Therefore, water resource problem is always a critical issue in Taiwan. How to conjunctive use of surface and ground water is a good alternative for such issue. To better understand the mechanism of subsurface flow, a surface and groundwater coupled model, WASH123D, is applied in this study. Pingtung Plain of southern Taiwan is selected as study site. The study evaluated seasonal groundwater level variabilities with subjecting to pump and rainfall. We used the seasonal rainfall outlook by weather modeling approximation to drive watershed model for assessment of groundwater variabilities. The local hydrological impacts of groundwater levels in upcoming season are discussed. Simulations showed a reasonable response of groundwater levels except for some mountainous regions. Results also indicated that rainfall amounts by seasonal outlook can be reasonable estimated, but that is not easy to precisely predict extreme rainfall occurrence both in the extreme wet and dry seasons. Groundwater level has dramatic varies in pumping aquifers, but the rest aquifers have minor influences in Pingtung Plain. Pumping strategy also play an important rule to the groundwater levels. The simulations showed that seasonal outlook integrated WGEN/WASH123D approximation to implement groundwater levels is feasible.

Keywords: groundwater levels, water resources, seasonal forecast