



## **Analysis of groundwater-induced deformation and hydraulic parameter in Taipei basin by InSAR measurement and numerical Model**

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Taipei basin is located in the northern Taiwan. In the historic records of groundwater level, it reveals that groundwater was overexploited in 1950s and has risen since the prohibition by government in 1970s. As for last decade, the short-term variation of ground deformation shows high correlation with groundwater level. In this study, we apply PSInSAR technique to detect land surface deformation by using 29 COSMO-SKYMED (CSK) satellite images in a period from May 2011 to April 2015. The result shows a basin-scale uplift during whole period, however, the time-series also indicated that the basin went through a subsidence stage and a followed uplift stage. With the land surface deformation information, we further made the comparison with groundwater level and evaluated the storativity of each well sites. Then, taking the advantage of spatio-temporal deformation maps, we estimated the storage variations of the aquifer between the time spans that groundwater level dropped and recovery. In order to discuss the relationship between land deformation due to groundwater level evolution and hydrogeological environment, we employed a finite-difference ground-water flow model (MODFLOW) with subsidence and aquifer-system compaction (SUB) package. The study refers to 12 borehole wells and constructs a numerical model for variation of groundwater flow and land subsidence in Taipei basin. The model contains two aquifers and a low-permeability confining layer as aquitard between them. In SUB package, we try to apply the InSAR results as the preliminary setting of parameters. Both the confining units and the deformation of the interbeds within aquifer are taken into consideration. Moreover, the time-delayed effects in the interbeds layers are further discussed.