On estimating the geo-material properties of Choshuishi Alluvial Fan

***Kuo-Chin Hsu[1], Chih-Chiu Tung[1], Chein-Lee Wang[1] and Youe-Ping Lee[2]**

1. Department of Resources Engineering, National Cheng-Kung University, Tainan, Taiwan, R.O.C.
2. Water Resources Agency, Ministry of Economic Affairs, Taipei, Taiwan, R.O.C.

Poroelastic theory is one of the common methods used in earthquake studies. To apply this theory to field data requires knowing the geo-material properties. The geo-material properties of the Choshuishi alluvial fan are estimated by three methods in this study: the first and the simplest one uses the soil properties from the textbooks of soil mechanics based on the soil texture, the other two utilize coseismic hydrologic response to the 1999 Chi-Chi earthquake based on the groundwater level changes and vertical displacements of ground surface. The volumetric strain efficiencies are calculated and compared to the values obtained by the dislocation model in the literature. Our result shows that by using soil mechanics and poroelastic theory, the volumetric strain efficiencies are found to be in the range of 2.3 to 36.9 cm/ppm for the aquifer. The method based on the changes of groundwater level results in the volumetric strain efficiencies ranged from 74 to 161 cm/ppm, which is in agreement with those calculated by the dislocation model. The result estimated from the vertical displacement of ground surface is 0.03~2.26 cm/ppm and is smallest among the three methods.