



## **Areal Distribution of Strong Earthquakes Related Groundwater-level Changes in Taiwan**

Ching-Yi Liu (1), Yung-Chia Chiu (1), and Yeeping Chia (2)

(1) Institute of Earth Sciences, National Taiwan Ocean University, Taipei, Taiwan, (2) Department of Geosciences, National Taiwan University, Taipei, Taiwan

Strong earthquakes induced groundwater-level changes were observed worldwide. In Taiwan, the groundwater monitoring network contains over 700 wells and is installed mostly in the plainer area. After the 1999 Chi-Chi earthquake, groundwater-level changes were started to be systematically studied. In this study, four strong earthquakes that occurred in Taiwan region were selected and groundwater level monitoring data were analyzed to evaluate the co-seismic groundwater-level changes. The areal distribution induced by the 2002 and 2006 earthquakes showed regional co-seismic groundwater level rise and fall. However, during the 2010 and 2016 inland occurred earthquakes, the areal distribution of co-seismic groundwater-level were mostly rising. Results from this study show that the areal distribution of the observed groundwater-level changes was inconsistent with the focal mechanism/volumetric strain change. Also, the expected groundwater-level changes at plate boundary were different to the observed changes, less response of wells and a small amount of groundwater-level changes. Furthermore, aquifers that lay between hard rock formations were more likely to remain unchanged, instead, co-seismic groundwater level changes in aquifers of unconsolidated deposits.