Precursory and Coseismic Groundwater Level Changes with Earthquake of Taiwan, 2003~2004

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Abstract

Taiwan is located at the active plate boundary between the Eurasian plate and the Philippine Sea plate. The active arc-continent collision along the Longitudinal Valley of eastern Taiwan generated the highly seismic activity along the eastern coast of the Taiwan Island.

The Disaster Prevention Research Center (DPRC) of National Cheng-Kung University has taken charge to establish the high quality monitoring network and related researches under the support from the National Science Council and Water Resources Agency. During the 2001~2005, sixteen observation stations located at the western foothills and the eastern coast will be establish. Specially, the observation wells located at the longitudinal valley of eastern Taiwan have good records for the earthquake induced precursory and coseismic groundwater level changes in a very short time.

The purposes of this study are to introduce the observation results of the observation network. The analysis of the tidal response and the atmospheric pressure response is used to estimate the mechanical properties of the aquifer. Comparison between the calculated crustal strain and the observed groundwater level changes in the each event, offers the opportunity to discussion the possible mechanism of the hydrologic response to earthquake. Since this April 2003, the real-time data show 30 waveforms resulting from earthquakes and 4 anomalies. Among 3 of the 4 anomalies, each is associated with an earthquake with magnitude 4-5 occurred in a few hours after the appearance of the anomaly. In order to observe more anomalies, the data of other three wells have modified into real-time observation this year.