[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-HW Hydrology & Water Environment

[A-HW24]Hydrological change after the 2016 Kumamoto earthquake

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More than two years have been passed after the occurrence of 2016 Kumamoto earthquake. Many investigators have been investigated the cause of observed coseismic hydrological changes such as spring lake dry up, groundwater level drop and rise. We also found groundwater quality changes before and after the quake and this information has been becoming accumulated. In fact, highly densed groundwater monitoring network installed in Kumamoto enables us to grasp comprehensive view of coseismic hydrological responses in very high resolution, so that, the results of these studies have high potential impact to this academic area globally. In this sense, we are welcome for all topics regarding coseismic hydrological changes after or even before the 2016 Kumamoto earthquake from broad point of view including hydrological cycle, deep water and hydrothermal water contribution, subsurface temperature, water quality, isotopes and microbiology. Topics of earthquake prediction and crustal defamation mechanism, surface morphological change in relation to hydrological changes are also welcomed.

[AHW24-P06]Tank model analysis of coseismic groundwater-level increasing induced by 2016 Kumamoto Earthquake

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After the 2016 Kumamoto Earthquake, the amount of spring water in the Suizenji Park was greatly reduced and faced a depletion crisis, while groundwater level at the observation wells showing a drastic rise. In this study, this groundwater level rising was evaluated using a tank model to distinguish whether it was caused by the earthquake. This model were applied to regionally distributed groundwater observation wells to clarify the spatial distribution characteristics.

A tank model was constructed to explain groundwater level data recorded at the observation wells. The amount of daily precipitation subtracted from the evapotranspiration estimated by the Thornthwaite method in each month were used as effective input amounts to the first tank. Also, since paddy fields are expected to recharge groundwater during the paddy irrigation period from May to October, we added paddy tank. The water level in the third tank was regarded as the groundwater level, and the parameter value was adjusted in each observation well so as to explain the measured groundwater level.

By constructing a tank model that explain the long-term actual groundwater level (measured value) over the past two years until the Kumamoto earthquake occurs, the difference from the measured and calculated value was evaluated as the extent of coseismic groundwater level increase. The coseismic groundwater level rise was found to be particularly large on the east side of the epicenter.