

The vertical changes of T and EC in the stratified water column in coastal well caused by M9.0 Tohoku-Oki earthquake

SOO-HYOUNG LEE¹, KUE-YOUNG KIM¹,
KYOCHUL HA¹, JE-HYUN SIN¹

¹Korea Institute of Geoscience and Mineral Resources, 124
Gwahang-ro, Yuseong-gu, Daejeon 305-350, South Korea,
rbagio@kigam.re.kr

This study evaluates the effect of groundwater changes at groundwater monitoring stations about 1,500km away from the epicenter of the Great East Japan Earthquake. M9.0 Tohoku-Oki earthquake occurred in Japan on March 11, 2011 at 14:46:23 local time (05:46:23 UTC time). In the eastern coastal region of Jeju volcanic island is composed of stratified of freshwater – transition zone – saline water. In the observation well, sensors were installed at 58m(S1), 63m(S2), 68m(S3) and 111m(S4) below the surface, respectively and which can be measured temperature and electrical conductivity at every 30 min interval. Other variation patterns by seismic waves were observed for each depth: spike-like, fall and rise, and persistent types. The monitoring well is consisted with two aquifers based on geologic logs and temperature/EC geophysical logging. The S3 and S4 sensors were nearly located at each aquifer shows completely reversed temperature/EC changes. In S3, EC was lowered due to the inflow of groundwater from the upper aquifer, however, in S4, the temperature/EC was increased due to the inflow of saline water from the lower aquifer. In summary, Earthquakes or seismic waves can lead to groundwater discharge or saline inflow in the island or coastal areas, and it suggest that research should be continued for the protection of water resources.