Influence of Distant Earthquakes upon Groundwater Flow — A Case Study in the Tono Area —

Groundwater-pressure monitoring has been conducted in boreholes with depths ranging from several meters to approximately 1000 m in the study area. This study uses monitoring data from the DH-9, MIU-3, and AN-1 Boreholes.

The earthquakes that changed pressure include (1) the Tokachi-oki earthquake of 2003, (2) the earthquake off the coast of Kii Peninsula in 2004, (3) the Suruga Bay earthquake in 2009, (4) the 2011 earthquake off the Pacific coast of Tohoku, (5) the earthquake in the east of Mino in 2011, (6) the earthquake on the west coast of northern Sumatra in 2012, and (7) the earthquake off the Sanriku coast in 2012.

Groundwater-pressure changes after each earthquake differed in each monitoring section. However, the changes all occurred in the same direction (increase or decrease) over the same monitoring section. Therefore, we will continue long-term groundwater-pressure monitoring to confirm changes in the hydraulic gradient.

These results show that it is important to focus on not only the change in groundwater pressure but also that in the hydraulic gradient in evaluating the long-term stability of the groundwater-flow condition.

Reference