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Groundwater changes associated with the 2011 Off the Pacific Coast of Tohoku Earthquake (M9.0)

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The 2011 off the Pacific Coast of Tohoku earthquake (M9.0) occurred on March 11, 2011. At many of groundwater observatories of Geological Survey of Japan, AIST in Tokai, Kinki and Shikoku, changes in groundwater level, groundwater pressure or groundwater discharge rate were observed associated with the earthquake. Most of the changes were drops and they were consistent with the static coseismic strain changes due to the fault slip of the earthquake. On the other hand, some of them were rises and they were not consistent with the static strain changes. This suggests that the rises were caused by dynamic strain changes.

Keywords: the 2011 off the Pacific Coast of Tohoku earthquake, groundwater level, groundwater pressure, discharge rate, volumetric strain