

AHW015-01

Room: Function Room B

Time: May 27 10:55-11:10

Groundwater anomalies around active faults in the source region of the 2004Mid Niigata Prefecture Earthquake

Tatsuya Ito^{1*}, Tsuyoshi Toyoshima¹, Watanabe Naoki², Kenta Kobayashi³, Satoh Sanae³, Ujihara Hidetoshi³, Tomoyuki Murayama³, Hagihara Atsushi³, Naoji Koizumi⁴

¹Grad. Sch. Sci. & Tech., Niigata Univ., ²Rsrch. Center Nat. Hazards, Niigata Univ,

³Dept. Geol., Fac. Sci., Niigata Univ., ⁴AIST

In this paper, we examine considerable changes in temperature, hydrochemistry and stable isotope ratio of groundwater around the epicentral area in five years (2005-2009) after the Mid Niigata prefecture Earthquake in 2004, using the snow-melting wells, and identify hydrogeological processes and origin of the groundwater.

There are considerable differences in temperature, hydrochemistry and stable isotope ratio of groundwater between the following two areas. One is along the Yukyu-zan active fault and its inferred extension. The other is along the Muikamachi active fault and its inferred northern extension. The former and latter areas are located on the hanging wall and footwall blocks, respectively, of the seismogenic source fault of the earthquake. The hanging wall and footwall have been under an E-W extensional and compressional conditions, respectively, related to the earthquake.

These suggest that hydrogeology and flow system of the groundwater along active faults in the Chuetsu area are greatly controlled by crustal deformation conditions. We also report that mixing of meteoric water with deep fossil seawater has formed Na-Cl type groundwater along active faults of the Chuetsu area. The fossil seawater is an abnormally pressured hydrothermal fluid ascending through the active faults. The meteoric water turned into the groundwater with low oxygen isotopic ratios in high altitude areas of the Echigo Mountains. The groundwater with low isotopic ratios subsequently become deep circulated groundwater and mixed with the fossil seawater in the depths of the Niigata Plain, forming the Na-Cl type groundwater.

Keywords: 2004Mid Niigata Prefecture Earthquake, active fault, ground water