

# Changes in water level after the Tokachi-Oki Earthquake in 2003 at hot water wells in Hokkaido

# Fujio Akita[1]; Norio Matsumoto[2]; Tomo Shibata[1]; Tetsuya Takahashi[3]

[1] Geological Survey of Hokkaido; [2] GSJ, AIST; [3] G.S.H

Changes in discharge rates and groundwater levels at many groundwater and hot water wells in Hokkaido Prefecture were observed after the after the Tokachi-oki earthquake in 2003.

Coseismic increases in water levels and discharge rates were observed at wells in eastern part of Hokkaido, especially in Konsen plain, Shari plain and southern part of Tokachi plain. In other area, coseismic decreases in water level and discharge rates are observed except several wells in Hakodate City.

Volumetric strain at each well due to the Tokachi-oki earthquake is calculated using fault model estimated by Geographical Survey Institute (2003). Generally, coseismic increases and decreases in water levels were observed in area where coseismic contractional and dilatational strain are estimated, respectively.

In OBK well (total depth 1328m, screened depth 950-1060m) at Obihiro City, coseismic changes in water level were observed due to the Kushiro-oki and the Hokkaido-nansei-oki Earthquakes in 1993 and the Hokkaido-toho-oki Earthquake in 1994, and the coseismic changes in water level are proportional to coseismic volumetric strain. (Akita and Matsumoto, 2001). Water level at OBK decreased 1.3 m after the Tokachi Earthquake in 2003, whereas estimated volumetric strain step was +1.87 micro strain at OBK. This result is consistent with strain sensitivity (8.1 mm/10<sup>-8</sup> strain) inferred from coseismic changes of water level and volumetric strain in previous study (Akita and Matsumoto, 2001).