



Hydrogeological Response to Earthquakes: A Case Study From Eskipazar (Karabuk-Turkey)

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Between 2007-2009, changes were observed in two geothermal and mineral springs located in Eskipazar and ~3-5 km to the NAFZ, with relation to small magnitude earthquakes. A temperature increase of 0.4-1oC was observed in Akkaya Hamamı Spring before three different seismic activities took place within a magnitude range of 2.8-3.2. With respect to seismic activity that took place in the closest point to the springs, probably due to mixing of other water, a decrease occurred in EC, TDS, Na, Ca and HCO₃ values of Acisu Mineral Water while there was a little amount of increase in discharge of Akkaya Hamamı Spring, which led to reduction in the values of EC, TDS, Ca, HCO₃, ¹³C, Al, Mn, Fe of the spring whereas increases in tritium and Se values. Few days previous to the earthquake that occurred at shallower points than the others, a temperature increase of 1 °C and decrease in the discharge, tritium, ¹³C and Si were observed in Akkaya Hamamı Spring. These variations could be explained by probable changes in the mixing ratio of different genesis water depending on changes of permeability, pore pressure, flow path of aquifer composed by the dilatancy-fluid diffusion model due to regional stress changes.