Changes in stream water and spring water after the 2016 Kumamoto earthquake, Japan

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The 2016 Kumamoto earthquake, whose main shock was an M7.3 event on April 16, 2016, 28 hours after a foreshock of M6.5, caused severe damage in and around Kumamoto Prefecture, Japan. It also caused postseismic hydrological changes in Kumamoto Prefecture. In this study, we analyzed daily streamflow data collected by eight observation stations from 2001 to 2017 in regions that experienced strong ground motion during the 2016 Kumamoto earthquake. We also surveyed 11 spring waters in the region several times after the main shock. Streamflow had no or slight change immediately after the earthquake; however, large increases were recorded at some of the eight stations following a heavy rainfall that occurred 2 months after the earthquake. A decrease in the water-holding capacity of the catchment caused by earthquake-induced landslides can explain this delayed streamflow increase. Conversely, earthquake-related changes to the spring flow rate were not so clear. Water temperature and chemical composition of spring waters were also hardly changed. Only the concentration of NO3-, which is usually considered to be supplied from the surface, increased slightly just after the earthquake. These results show that the postseismic hydrological changes were caused mainly by earthquake-induced surface phenomena(Koizumi et al., 2019).

Reference

Koizumi, N., S. Minote, T. Tanaka, A. Mori, T. Ajiki, T. Sato, H. A. Takahashiand N. Matsumoto, Hydrological changes after the 2016 Kumamoto earthquake, Japan, Earth, Planets and Space, 71, https://doi.org/10.1186/s40623-019-1110-y, 2019.

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