

Paleoseismic history of normal faults appeared along the south side of Nigogawa river in the eastern part of the Aso caldera

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Surface ruptures appeared along the Futagawa-Hinagu fault zone associated with the 2016 Kumamoto Earthquake. Their trace exceeded the northern end of the Futagawa segment estimated before the earthquake, and extended to the eastern part of the Aso caldera. About 2.5-km-long E-W trending branch separated from the NE-SW trending main trace at Tateno in the Aso caldera. Their traces appeared to coincide with preexisting grabens distributed along the south side of the Nigogawa river. This suggests that the branch is an active fault. GSJ, therefore, conducted a trench investigation in the graben to confirm that they are an active fault, and to obtain a paleoseismic history such as the latest event or recurrence interval at Sawaduno district, Minamiaso village.

The trench investigation conducted in a E-W trending graben 2 km east of Tateno district, which is about 50 m wide and 2~4 m scarps. Soon after the earthquake two traces of surface ruptures appeared almost along the foot of north and south scarps of the graben. We measured about 50-70 cm vertical displacements along those traces. Boring survey conducted before trench investigation revealed Kusasenrigahama pumice layer (Kpfa) appeared 7~8 m depth out of the graben, but it appeared 16 m depth in the graben. The depth difference larger than scarps of the graben indicates continued subsidence. The trench, which is 34 m long, 7 m wide, and 4 m deep, was excavated across two traces. On the east and west wall, two strands of normal fault and deformed layers dipping towards the center of the graben appeared. The sediment is mainly composed of loam came from Aso Volcano. On some trench walls, a few number of widespread tephra such as K-Ah, AT, and Kpfa, and some pieces of clay pot of the Yayoi period were recognized. Some layers showed many open cracks produced by bending down towards the faults. The vertical displacements along some faults of older (lower) layers had accumulated more than younger (upper) layers. In this presentation, we will report the estimated seismic history after about 30 ka by some ¹⁴C dating and our detailed observation.

Keywords: 2016 Kumamoto Earthquake, Futagawa fault zone, surface ruptures, trenching survey, Aso caldera