

A sinkhole emerged at the foot of the scarp of Matoishi Bokujo I Fault, northwest of outer rim of Aso caldera

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In the northwestern part of outer rim of Aso caldera, a low relief surface originated from the deposit surface of Aso-4 pyroclastic flow spreads, and multiple active faults running parallel from west-northwest to east-southeast have been mapped (Suzuki et al. 2017). It has been clarified that a number of “triggered surface faults” including those on these active faults have appeared associated with the 2016 Kumamoto earthquake (Fujiwara et al, 2016, Une et al, 2017). Among these, on the Matoishi Bokujo I fault, geomorphological and geological surveys including a pit survey, simple boring surveys and ground penetrating radar surveys were conducted, and it was inferred that the Aso-4 pyroclastic flow deposit surface was displaced to form a fault scarp as the result of the accumulation of similar triggered faulting (Une et al., 2019).

In November 2019, it was discovered that a new sinkhole with a diameter of about 3 m had been formed at the foot of the Matoishi Bokujo I fault. The depth was about 4 m, the inside was about 5 m wide, and the length was at least 10 m, gently dipping to the south. No clear channel was found in the hole. On the inner wall of the hole, a sandy and muddy black ash containing a lot of breccia appeared at the upper part, and a white sediment likely to originate from pyroclastic flow deposits appeared at the lower part. The white sediment is cut into a south-drop fault, and the black ash layer is deformed to increase the slope to the north. These characteristics were consistent with observations from a pit survey conducted approximately 200 m east of this site (Une et al., 2019).

In this report, we will discuss the geomorphology of the sinkhole, its origin, and its relation to fault activity, including the results of subsequent surveys.

Keywords: sinkhole, outer rim of Aso caldera, pyroclastic flow deposit surface, fault scarp