

Preliminary report on sequence and deposits of the 2014-2015 eruption of Nakadake crater, Aso Volcano, Japan

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Nakadake crater, Aso Volcano in central Kyushu, southwestern Japan, began a series of eruptions on November 25, 2014. The activity continues to the present (February 2015), and the ash-fall deposits are distributed mainly southeast of the crater. We focus on the November 25-29 and December 9-11, 2014 eruptive events and their deposits.

The November 25-29 ash-fall deposits extended about 30 km to the east of the source crater with two dispersal axes (E and S trending). The ash distribution is consistent with wind directions changing from southwest-northwest (~15:00 on November 25) to north (between 16:00 on November 25 and 17:00 on November 27). The deposits were 4-5 cm thick (ca. 40 kg/m²) at the southwestern to southern rims. Although well-vesiculated scoriaceous clasts (<30 cm in diameter) were observed on the surface, most of the deposits were black to dark gray sand-sized ash. The total weight of the November 25-29 ash-fall deposits was estimated at about 150,000 tons.

The December 9-11 ash was distributed mainly southwest of the Nakadake crater although it was dispersed to the north and east. The measured dried weights were 2.7 kg/m² at the southwestern crater rim and 2 kg/m² at 1.2 km southwest of the vent. The total weight of December 9-11 ash was calculated at approximately 70,000 tons. The event produced mostly sand-sized ash, but also well-vesiculated scoriaceous bombs which could be traced about 4 km of the crater.

The November 25-29 and December 9-11 ash-fall deposits were composed mainly of black to brown vesiculated glass grains although they contained lithics and crystals. Black crystalized glass particles were dominant in the former ash, whereas the proportion of brown lustrous glass grains increased in the latter ash.

The eruptive activity of Nakadake after November 25, 2014 was characterized by continuous ash emission from a vent of 20-30 m across (141 vent) formed near the center of the active crater (Nakadake first crater) and contemporaneous strombolian eruptions producing scoriaceous bombs at the same vent. During the 1989-1990 activity, strombolian eruptions occurred a few months after the beginning of the activity. In contrast, strombolian eruptions were recognized immediately after the initiation of the series of the 2014-2015 eruptions.

Keywords: Aso Volcano, Nakadake, ash eruption, strombolian eruption, eruption deposits