National Institute of
Advanced Industrial Science and Technology (AIST)

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**The Pyroclastic Flow Generated by the September 27, 2014 Eruption of the Ontake Volcano**

The pyroclastic flow photographed by the Chubu Regional Development Bureau's camera at Takigoshi had the following characteristics.

1) Pyroclastic density currents occurred in two places (Jigokudani and Kengamine West).
2) The pyroclastic flow traveling down through Jigokudani moved at a speed of over 30 km/h.
3) After the pyroclastic flow stopped, conspicuous secondary ash plume was observed rising from the tip of the flow; this suggests that the flow possessed sufficient heat for the ash cloud to have risen due to its buoyancy after separating from the more coarse-grained pyroclastic material.

The results of calculations using the energy cone model indicate the following.

1) The eruption column collapse height of the pyroclastic flow from Jigokudani is estimated to have been around 200 m (Figure 1). If it had exceeded 400 m, the pyroclastic flow would have overflowed the ridge beyond the valley.
2) If the collapse height of the pyroclastic flow's volcanic smoke from Kengamine West had been in the region of 200 m, the pyroclastic flow would have been able to run down Shakunandosawa, a ravine on the mountain's northwestern side (Figure 2).
3) If the eruption crater line had expanded in an eastward direction, erupted on the southern slopes of the Otaki summit and generated a pyroclastic flow with a column collapse height of around 200 m, then there is a possibility that such a flow would have impacted a wide area on the mountain's eastern slopes including several mountain trails. (Figure 3).

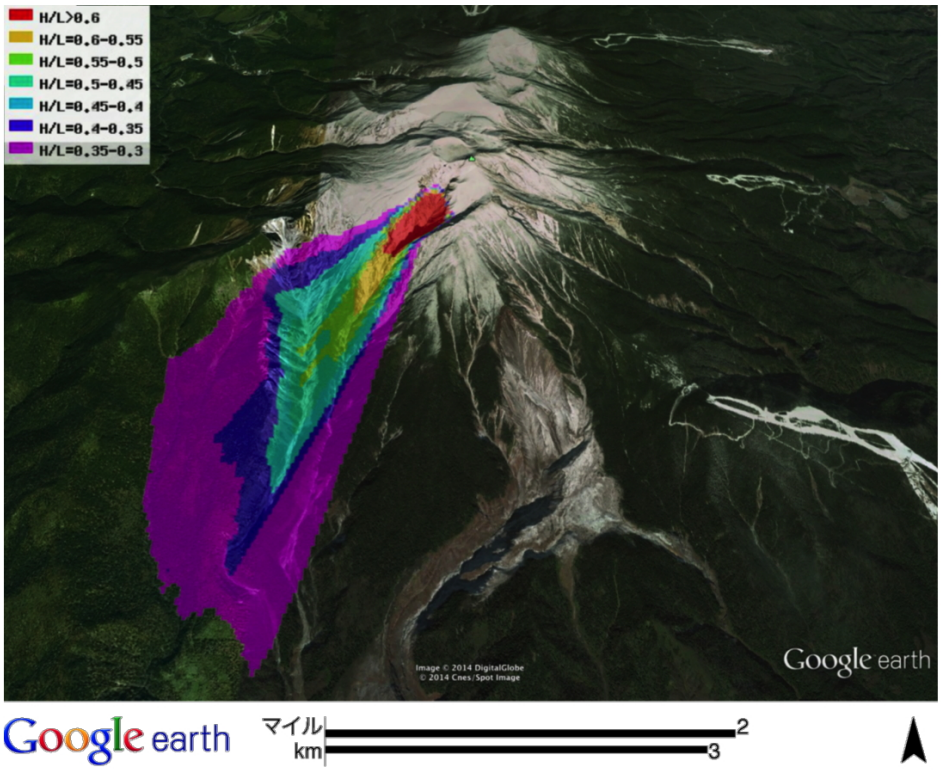


Figure 1 Result for a pyroclastic flow from the vent in the Jigokudani Gully at 2700 m a.s.l using the Energy Cone model. The column collapse height is 200 m. The distribution of the September 27th pyroclastic flow matches the model when its Heim coefficient is about 0.5. Arrow indicates the north direction.

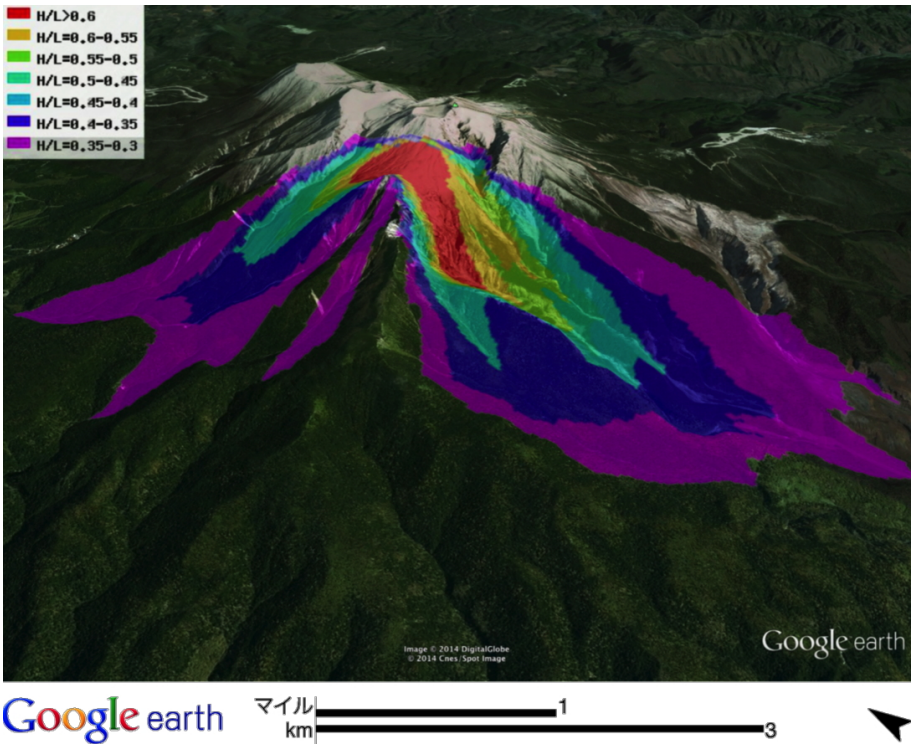


Figure 2 Result for a pyroclastic flow from the vent on the western slope of Kengamine at 2800 m a.s.l using the Energy Cone model. The column collapse height is 200 m. The distribution of the September 27th pyroclastic flow matches the model when its Heim coefficient is about 0.55. Arrow indicates the north direction.

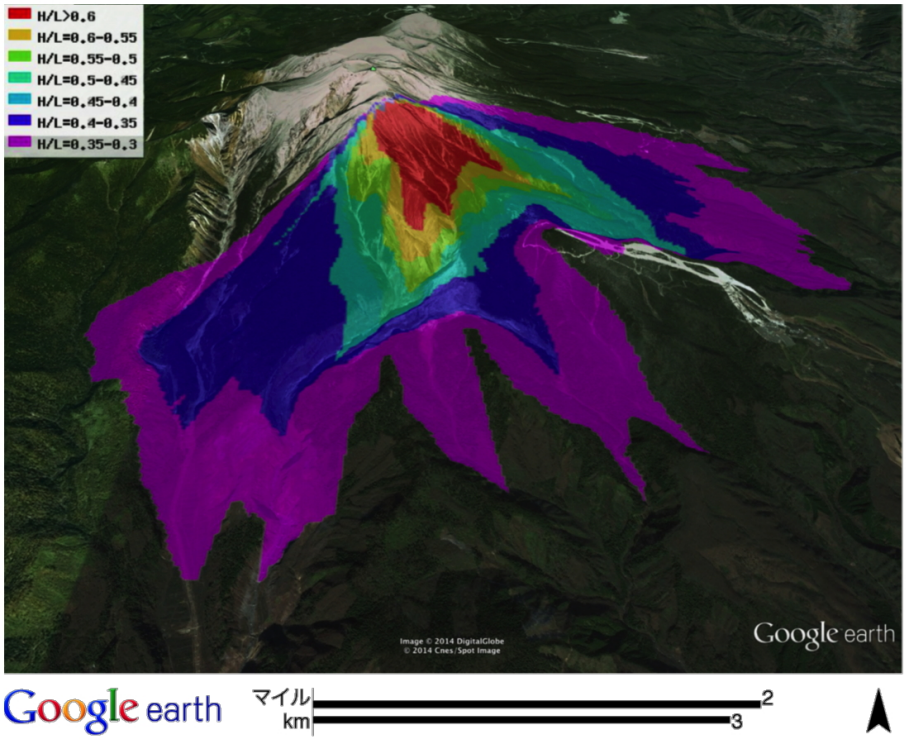


Figure 3 Result for a pyroclastic flow from the vent on the southern slope of Otaki summit at 2800 m a.s.l using the Energy Cone model. Arrow indicates the north direction.