

On the fumarolic activities of Niigata-Yakeyama in early Showa era, and the review of 1949 eruption.

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Niigata-Yakeyama is an active volcano located at southwestern of Niigata Prefecture. The past activities of Niigata-Yakeyama were investigated by Hayatsu(2008). A moderate magmatic eruption occurred in 1773, accompanying pyroclastic-flows. During the 20th century small phreatic explosions occurred in 1983, 1997, and 1998. As of December 2016, fumarolic activities were found to exit on the summit.

At the end of 2015, the fumarolic activities were observed to be high level, the heights of steam plumes were observed to be higher than previously. A small ash emission occurred in April, May, July 2016, accompanying slight ash fall near the summit.

After Kunii(1950), the fumarolic activities existed in about 1894,1917, and 1918. A new fumarole was generated in 1927, but there were no reports of fumarolic activities after 1927, until the 1949 eruption occurred.

Japan Meteorological Agency observes or monitors the volcano activities or eruptions and publishes the data of volcanic activities as bulletins since Meiji era. Historically, such as Syowa era, disclosure or publications of them were not sufficient.

Niigata Local Meteorological Office has old observation data or documents on Niigata-Yakeyama. These data include the reports conducted by Kami-Hayakawa village in 1930s, and the investigation reports of the eruption that occurred in 1949. According to the documents, local inhabitants at about 10km from the summit crater heard the sounds of plume ejection, the sounds were like a jet engine or an automobile' s engine. The inhabitants also sensed the smell of volcanic gas in 1932. The villager or climbers found a hot geyser near the summit in July 1932. Local inhabitants saw 'White Line' on the slopes of Niigata-Yakeyama, actually that was a hot water flow. The same phenomenon occurred in the 1949 eruption, the 1974 eruption and in July 2016.

We re-inspected the documents of the eruption occurred in February 1949, and we estimated the amount of ash fall based on the data of ash fall depth. We compared those two eruptions, the 1949 eruption and the 1974 eruption, estimated which eruption was larger or more explosive.

In the 1949 eruption, an explosive sound or air shock were felt by the inhabitants at 16km from the summit crater. By contrast, in the 1974 eruption, an explosive sound was felt at 4 to 6km from the summit crater.

The 1949 crater was located at the east-side slope of the mountain, the 1974 crater was located at the west-side slope of the mountain, therefore the difference of crater location might cause the difference of explosive sound propagation.

The depth of ash fall of the 1949 eruption were about 30 millimeters at SEKI hot spring, TSUBAME hot spring, 21 millimeters along JR Shin-etsu Line, and 11 millimeters at Shinano-Daira station.

We estimated the amount of ash fall of the 1949 eruption, the weight of the total ash fall was at least about 2.0×10^6 tons. After Chihara(1975), the total amount of ash that was ejected of the 1974 eruption was 6.5×10^5 tons. We consider that the amount of ash fall of the 1949 eruption will be as same as that of 1974 eruption.

Seismic activity remains above background levels. According to GNSS measurements, the dilatation of the baseline that traverses the summit has declined since summer of 2016. We need to monitor volcanic activities continuously.

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