

## Fumarole activity at the southwest rim of Ioyama crater in the Ebinokogen

\*Yasuhisa Tajima<sup>1</sup>, Fukashi Maeno<sup>2</sup>, Setsuya Nakada<sup>2</sup>, Observation members Kirisima nature guide club<sup>3</sup>

1. NIPPON KOEI CO.,LTD., 2. Earthquake Research Institute, The University of Tokyo, 3. Kirisima nature guide club

A new fumarole that appeared on the southwest rim of the Ioyama crater in the Ebinokogen volcanic area on 14 December 2015 spread rapidly in January–February 2016. The occurrence of frequent volcanic earthquakes in a single day, on 28 February 2016, led the Japan Meteorological Agency (JMA) to issue a level-2 volcanic alert (JMA website<sup>1</sup>). Although the volcanic alert level was downgraded to level 1 in March, a gradual spread of the fumarole area was observed in April and August 2016. The present study measured the high-temperature area by employing easy triangulation using two tape measures; however, this method was difficult to apply to the expanding area in late August. Therefore, air photographic survey by drone was used in high-temperature areas.

Prior to the drone observation, we set markers showing 50°C on 20, 22, 25, and 27 November 2016. Just before the day of observation on 9 December, the 50°C points were modified. Aerial footage was recorded by the Phantom 3 drone on 10 and 11 December which was then converted to orthophotographic images. Markers with diameters of 18 cm were more clearly observed about tens of meters height above ground level and were plotted on the orthophotographic images, and the areas of 50°C were then measured. The high-temperature area was 3500 m<sup>2</sup> on 10 December, which indicates an expansion of the 2200 m<sup>2</sup> high-temperature area measured on 20 August.

Very high concentrations of H<sub>2</sub>S volcanic gas were observed in the middle of October (Miyazaki prefecture website<sup>2</sup>). White turbidity in the river caused by sulphur from Ioyama was found on 29 October by a member of the Kirisima Nature guide club. It was assumed that expansion of the high-temperature area was occurring at that time. On 12 December 12, frequent volcanic earthquakes occurred (JMA website<sup>1</sup>). The expansion of the high-temperature area from December 2015 to February 2016 and from October 2016 to the present indicates the occurrence of strong underground volcanic activity.

1 <http://www.data.jma.go.jp/svd/vois/data/tokyo/volcano.html>

2 <http://www.pref.miyazaki.lg.jp/kiki-kikikanri/kurashi/bosai/iouyamagasu20160226.html>

Observation members of Kirisima nature guide club: Toshio Furuzuno, Kentaro Haraguchi, Takeji, Nagatomo, Takamichi Higashi, Hideaki Yoshinaga, Midori Baba, Masashi Takada, Yukikazu Matsumura.

Keywords: Kirisima volcanoes, Ioyama, Fumarole