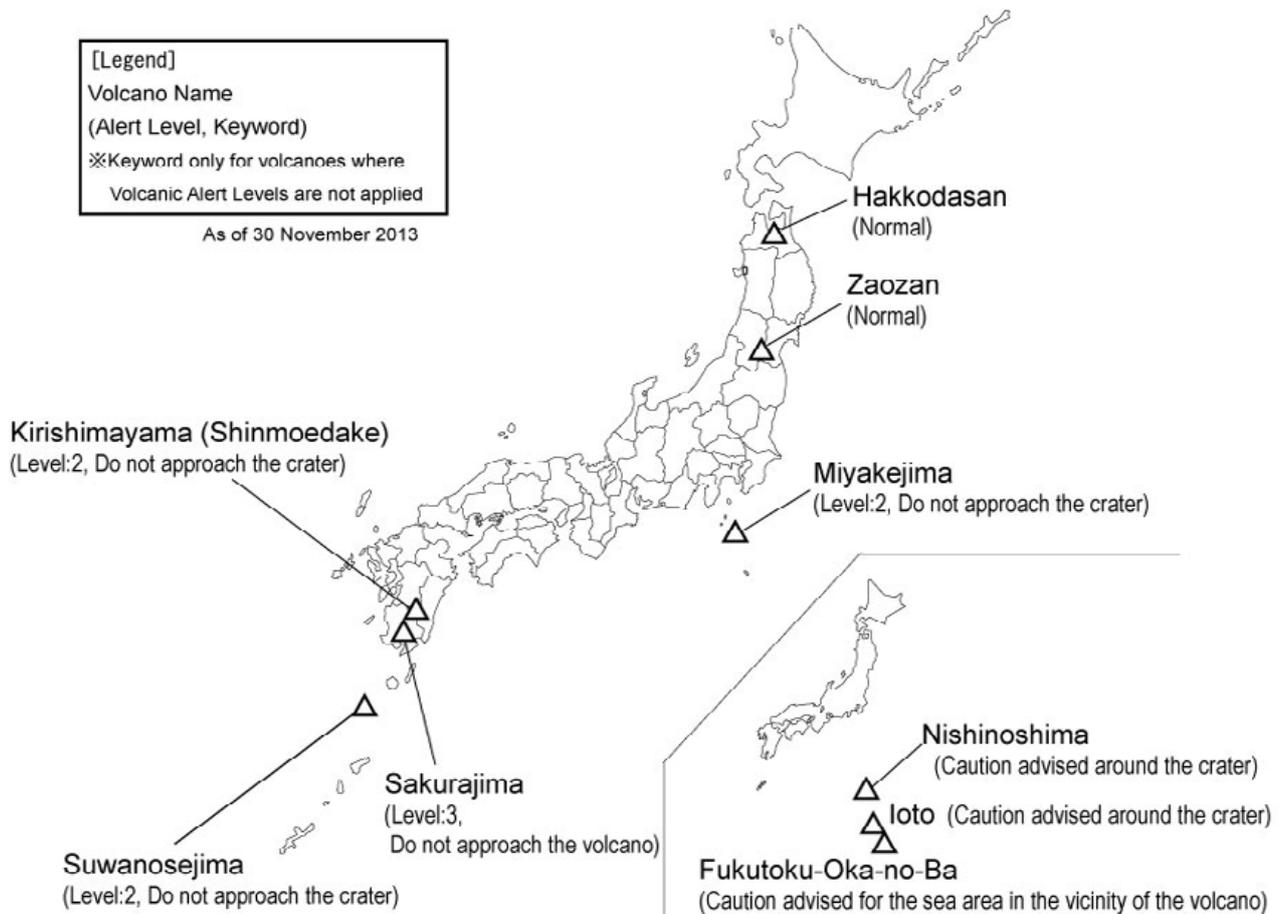


# Monthly Volcanic Activity Report (November 2013)

Japan Meteorological Agency



## Hakkodasan (Normal)

Seismicity in and around Hakkodasan has been relatively high since the 2011 off the Pacific coast of Tohoku Earthquake (the 2011 Great East Japan Earthquake: 11 March 2011). Seismic activity beneath the Otake summit reached a high level in late April 2013 before diminishing in late July but continuing.

According to the result of a field survey conducted on 21 November, there had been no remarkable changes since the last survey in terms of fumaroles or high-temperature zones in the northwestern part of Jigoku-numa, along parts of its eastern shore or in Sainokawara (7 August 2013).

Data from ground deformation observation around the volcano had shown slight inflation since February 2013, which began to slow down around August and stopped around November.

Continuous GPS observation data from temporarily stations at Minamikomagome and Minamiarakawayama showed no remarkable changes between 15 June and 20 November 2013.

## Zaozan (Normal)

No fumes were recorded in visual observation.

A volcanic tremor was recorded on 1 November. A slight tilt change was observed at Boudaira station just before the tremor, but no changes in low-frequency microphone records or surface phenomena were seen. Such tilt changes had been observed previously. Volcanic seismicity has remained at low levels.

## Miyakejima (Alert Level: 2)

The rate of volcanic gas emission has been on a long-term declining trend and has remained relatively low since February 2013. According to a report from Miyake Village, relatively high concentrations of SO<sub>2</sub> were recorded only occasionally in inhabited areas.

Volcanic seismicity has generally remained at low levels, and No volcanic tremors have been observed. According to continuous GPS observation data, ground deformation indicating contraction in shallow parts of the mountain began to diminish gradually in 2000 and stopped around 2013. Long-term extension of the baseline along the north-south section of Miyakejima has also been observed since 2006, indicating expansion in deeper parts.

## Nishinoshima (Near-crater Warning) ← issued on November 20

On 20 November, the Japan Maritime Self-Defense Force (JMSDF) and the Japan Coast Guard (JCG) reported that an eruption around Nishinoshima had formed a new island. According to observation conducted by JCG on the same day, the new landform was located about 500 m southeast of the Nishinoshima coast and was emitting a black plume. Analysis of result from JCG observation conducted on 21 November revealed that the new island was located where a previous eruption had occurred in 1973.

Aerial observation conducted by the University of Tokyo in conjunction with the Asahi Shimbun Company on 24 November, showed a lava landform jutting out into the sea on the northeastern side of the new island. Collaborative aerial observation conducted by the Japan Meteorological Agency (JMA) and JCG on 26 November showed eastward expansion of the jutting-out part for a total length of 50 m. Additional aerial observation conducted by JCG on 30 November showed further eastward expansion.



Photo 1. Eruption at the new island (Courtesy of the 3rd Regional Coast Guard Headquarters, JCG)



Photo 2. Overview of Nishinoshima and the new island (Courtesy of the 3rd Regional Coast Guard Headquarters, JCG)

## Ioto (Near-crater Warning)

Phreatic eruptions have occasionally occurred since early February 2012 at the old crater (known as Million-dollar Hole) on the western part of the island. However, no eruptions were observed in November.

Volcanic seismicity has remained at relatively low levels. Small-amplitude volcanic tremors were recorded on 8, 9 and 10 November. No anomalies were observed in other observation data before or after these tremors. Geospatial Information Authority of Japan (GSI) ground deformation data show that the ground began rising in May 2013, entered an almost static state in September, and then started to subside in November.

### **Fukutoku-Oka-no-Ba (Near-sea-area Warning)**

Past observation conducted by JCG, JMSDF and JMA, has frequently identified discoloration and floating objects in the waters surrounding Fukutoku-Oka-no-Ba in recent years, which are considered to stem from volcanic activity. The latest submarine eruption occurred on 3 February 2010.

### **Kirishimayama (Shinmoedake)(Alert Level: 2)**

No eruptions were observed at Shinmoedake in the reporting period (the last explosive eruption occurred on 1 March 2011, while the last eruption of any kind was on 7 September of the same year).

Volcanic seismicity remained at low levels. No remarkable changes were observed in ground deformation observation data or other statistics.

The supply of magma from deeper parts to the magma chamber located several kilometers northwest of the crater has stopped.

Volcanic activity at Shinmoedake has been relatively calm. However, the lava accumulated in the crater has remained in a high-temperature state, and the possibility of small eruptions is present even now.

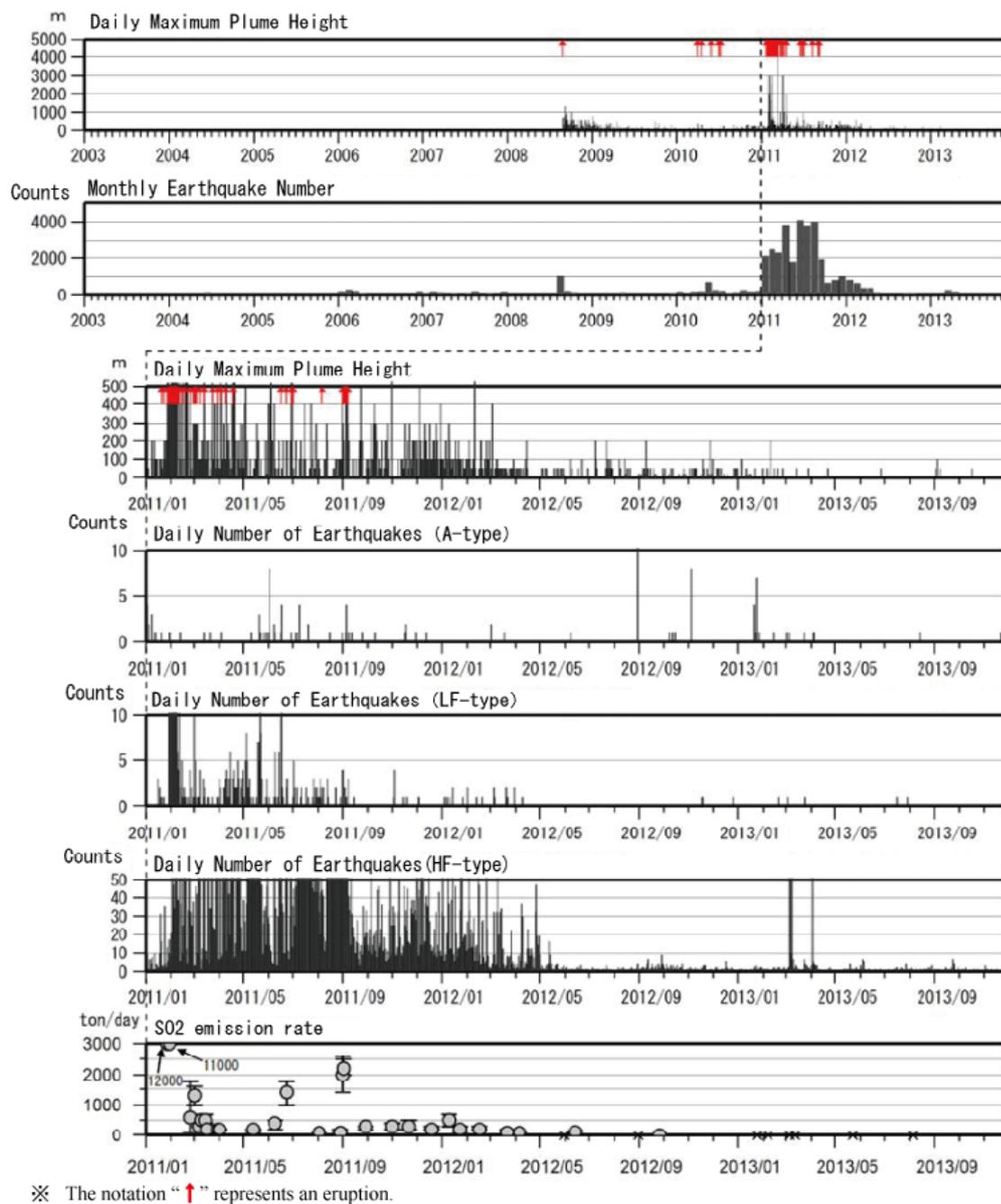


Fig. 1 Seismicity, plume activity and SO<sub>2</sub> emission rate at Shinmoedake from January 2003 to November 2013

### Sakurajima (Alert Level: 3)

Explosive and other types of eruption activity at the Showa crater have remained at high levels. During this reporting period, 50 of the 69 eruptions observed were explosive.

Along with an explosive eruption at 16:23 (JST) on 24 November, a large plume rose to 4,000 m above the crater rim and drifted northeastward. According to the result of field surveys and hearing investigations, volcanic ash fell on an area stretching from Sakurajima Island to Kirishima City and the southern part of Miyazaki Prefecture. Lapilli with diameters of up to 7 mm were found over an area stretching from Komencho to Kurokamicho (about 4.5 km northeast of the Showa crater on Sakurajima Island). In conjunction with explosive eruptions at 16:28 (JST) on 18, 01:31 on 26 and 02:45 on 29 November, lapilli with diameters of up to about 1, 1.5 and 1 cm, respectively, were found in Kurokamicho (about 4 km southeast of the Showa crater on Sakurajima Island).

Clear volcanic glows in the Showa crater were occasionally recorded at night with high-sensitivity cameras.

At the Minamidake summit crater, very small eruptions occurred on 16 and 22 November. These were the first eruptions observed since 16 August 2013.

While volcanic seismicity remained at low levels in November, volcanic tremors accompanied the eruptions. Field surveys conducted to measure SO<sub>2</sub> flux on 11, 15, 22, 26 and 29 November showed relatively high values of around 900 – 1,500 t/d. The results of continuous GPS measurement had shown that a tendency of inflation on Sakurajima Island began around February 2013, while an almost static state or a tendency of slight contraction has been seen since around July 2013. Some baselines across Kagoshima Bay (Kinko Bay) had shown a tendency of extension, but have exhibited an almost static state since June 2013. Ashfall on Kagoshima Local Meteorological Observatory (KLMO) amounted to 7 g/m<sup>2</sup> in November. The total amount of ashfall in October estimated from data provided by the Kagoshima Prefectural Government was about 1.0 million tons, which was the largest amount since the resumption of activity at the Showa crater in 2006.

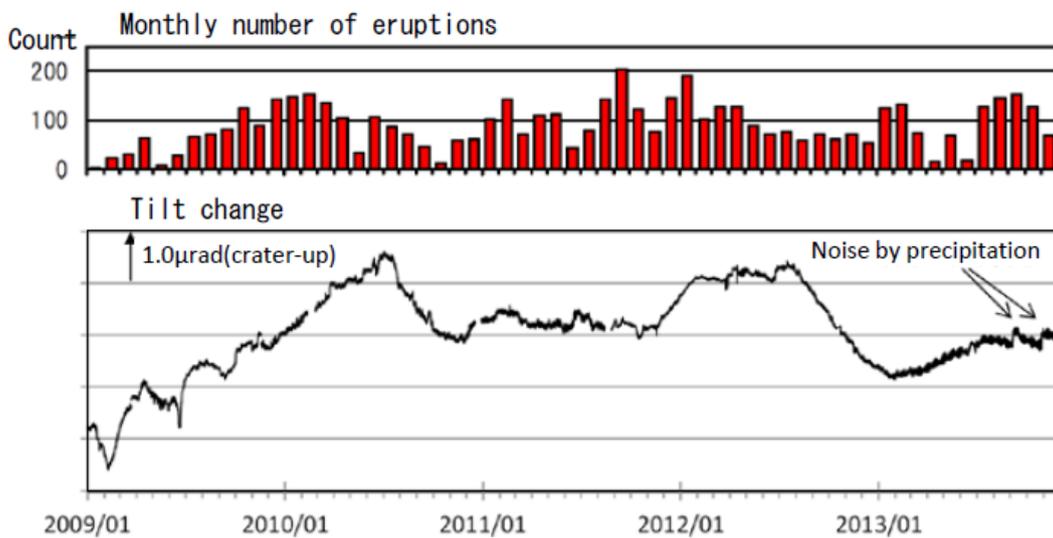


Fig. 2 Tilt change observed with a water-tube tiltmeter at Arimura Station from January 2009 to November 2013 with tidal response eliminated. Upheavals of the summit side correspond to positive tilts. The red bars in the figure denote the monthly number of eruptions at the Showa crater.

### Suwanosejima (Alert Level: 2)

Seven explosive eruptions occurred at the Otake crater on 27 November, and high-sensitivity cameras captured the resultant scattering of volcanic projectiles around the crater. These were the first explosive eruptions observed at Suwanosejima since 30 September 2013. In addition, very small eruptions also occasionally occurred, and were accompanied by gray plumes rising generally less than 600 m and a maximum of 1,000 m above the crater rim. Weak volcanic glows in the crater were occasionally recorded at night with high-sensitivity cameras. Volcanic tremors occurred intermittently.