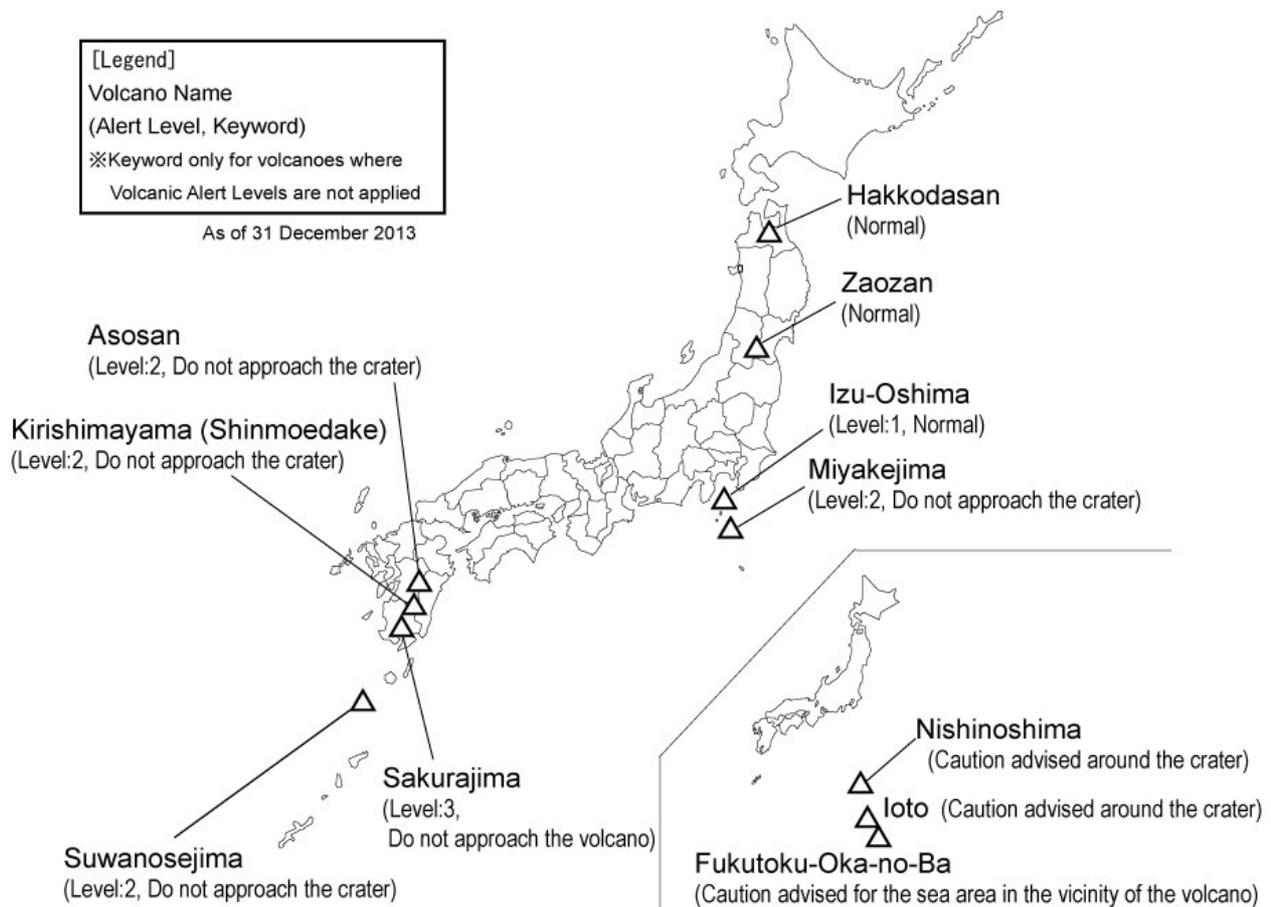


Monthly Volcanic Activity Report (December 2013)

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. On 29 November, seismicity temporarily increased around the eastern part of Kushigamine in the southern part of the Hakkoda volcanic group. It subsequently decreased and has remained at low levels since 30 December.

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 temporary stations at Minami-Komagome and Minami-Arakawayama showed no remarkable changes between 15 June and 31 December 2013.

Zaozan (Normal)

No fumes were recorded in visual observation.

Volcanic tremor were recorded on 4 December, 8 December and 3 January 2014. A slight tilt change was observed at Boudaira station just before the tremor on 8 December, 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.

Izu-Oshima (Alert Level: 1)

The number of earthquakes occurring around the eastern area of Izu-Oshima increased from 21 December onward. This was particularly prominent, on 2, 3 and 4 January, when 30, 80 and 27 volcanic seismic events were observed, respectively. Seismic activity declined thereafter, with eight earthquakes occurring on 5 January and six the following day. Among these events, a M-2.1 earthquake that occurred at 21:55 on 30 December measured 1 on the Japan Meteorological Agency (JMA) scale in the southeastern part of the island. Similarly, M2.4 and M2.7 earthquakes occurring at 02:15 on 2 January and at 08:21 on 3 January, respectively, registered maximum intensities of 2 on the JMA scale.

According to continuous GPS observation data, although long-term extension of the baseline caused by magma intrusion into deeper parts has been ongoing, its progress has been gradually slowing since 2011.

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 SO₂ 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)

A report by the Japan Maritime Self-Defense Force (JMSDF) and the Japan Coast Guard (JCG) showed that the eruptive activity of Nishinoshima, including expanding lava flows, remained at a high level.

Aerial observation conducted by JCG on 26 December revealed that two tips of a lava flow from the northern part of the new island had reached Nishinoshima, thereby uniting the two landmasses.



Photo 1. Aerial view from SSE at 09:26 on 26 December (courtesy of JCG)

A and B represent the eastern and western junctions at the northern part of the new island, respectively.

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. No volcanic tremors were recorded.

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)

Aerial observation conducted by JMSDF on 16 December revealed green discoloration of sea water, spreading about 1,850 m eastward of its upwelling points. However, aerial observation conducted by JCG on 28 December showed that the discoloration around the volcano had disappeared.

Asosan (Alert Level: 2) ← Alert Level raised from 1 to 2 on 27 December

The amplitude of volcanic tremors began to gradually increase around 20 December. A field survey conducted on 24 December showed that the SO₂ flux was around 1,100 t/d, which was greater than that measured in the previous survey on 12 December (700 t/d). In addition, a field survey on 25 December revealed that hot water covered less than 10 percent of the Nakadake No. 1 crater, and that mud spouted to a height of approximately 10 m from its center.

In recognition of increased volcanic activity in the Nakadake No. 1 crater and the possibility of an eruption that may scatter ballistic rocks up to 1 km away from the crater, JMA issued a Near-crater Warning at 10:00 JST on 27 December and raised the Volcanic Alert Level from 1 (Normal) to 2 (Do not approach the crater).

A field survey on 31 December showed that SO₂ flux was around 900 t/d, which was relatively high.

Volcanic tremor amplitudes rapidly decreased on 2 January before returning to levels seen before 20 December 2013 the following day.

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.

Sakurajima (Alert Level: 3)

Explosive and other types of eruption activity at the Showa crater have remained at high levels. During this reporting period, 22 of the 40 eruptions observed were explosive. Ballistic rocks were ejected as far as the third station (1,300 – 1,800 m from the Showa crater) during explosive eruptions at 21:46 JST on 14 December.

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 24 and 29 December.

While volcanic seismicity remained at low levels in this period, volcanic tremors accompanied the eruptions.

Field surveys conducted to measure SO₂ flux on 10 and 24 December showed relatively high values of around 1,700 – 1,800 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. The total amount of ashfall in November was estimated to be about 0.5 million tons based on data provided by the Kagoshima Prefectural Government.

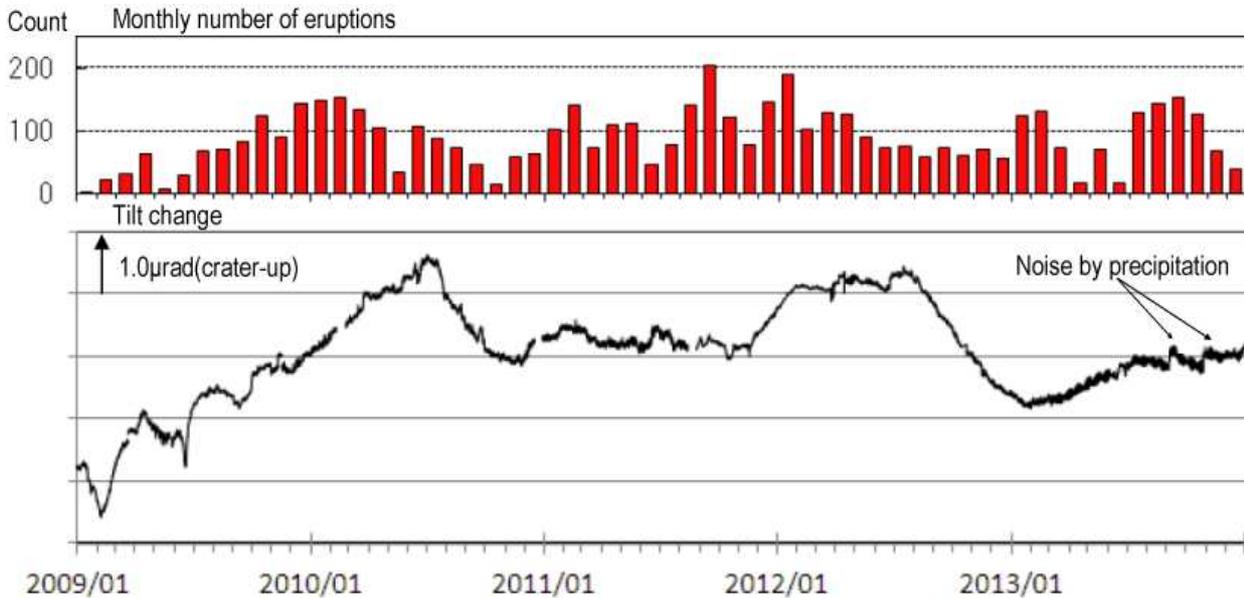


Fig. 1 Tilt change observed with a water-tube tiltmeter at Arimura Station from January 2009 to December 2013 with tidal response eliminated. Upheavals of the summit side correspond to positive tilts. The red bars in the figure denote monthly number of eruptions at the Showa crater.

Suwanosejima (Alert Level: 2)

Eruptive activity at Suwanosejima has remained at high levels, with 247 explosions at the Otake crater from 26 to 31 December.

A total of 125 explosions were observed on 29 December along with volcanic tremors and air shocks from approximately midnight to after 03 JST, indicating consecutive eruptions. High-sensitivity cameras captured the resultant scattering of volcanic projectiles around crater. Along with these eruptions, gray plumes rose 600 m above the crater rim each time, and weak volcanic glows in the crater were occasionally recorded at night with high-sensitivity cameras.

According to the Suwanosejima branch of the Toshima Village administration, a tiny amount of ashfall was observed in the settlement of the island (about 4 km south-southwest of Otake) on 8 December. Air shocks also rattled windows and sliding doors on 28 and 29 December, and volcanic glows were observed at night on the island.