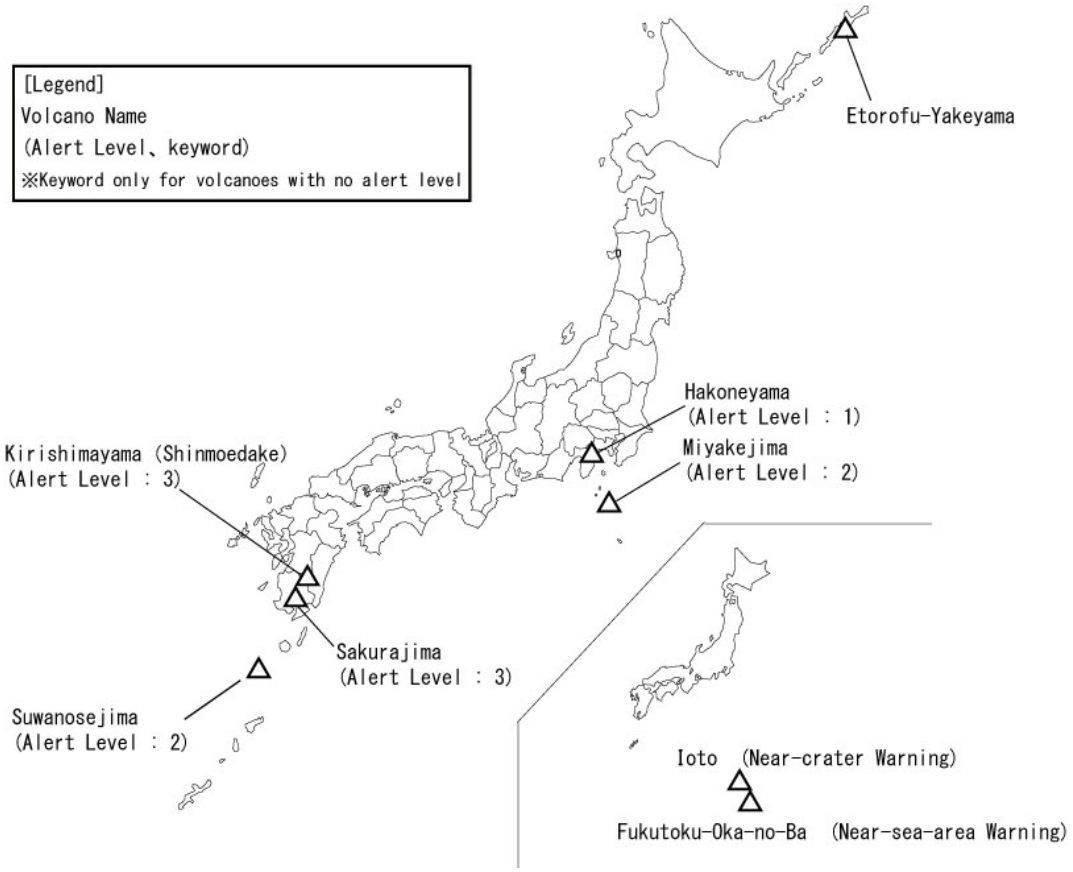
Monthly Volcanic Activity Report (March 2013)



Hakoneyama (Alert Level: 1)

Shallow earthquake activity from the area near Mt. Komagatake to Sengokuhara has largely remained at low levels since the middle of February. The results of volumetric strainmeter observation by the Japan Meteorological Agency (JMA) and tiltmeter observation by JMA and the Hot Spring Research Institute of Kanagawa Prefecture indicated slight inflation of the volcano, which has slowed down since the middle of February. According to crustal deformation data obtained by the Geospatial Information Authority (GSI), some baselines around Hakoneyama exhibited slight extension from around the end of 2012, but this activity has slowed since February 2013.

Miyakejima (Alert Level: 2)

Gas-and-steam plumes rose to heights of approximately 100 – 200 m above the crater rim. According to field surveys conducted on March 7th and 22nd, sulfur dioxide (SO_2) was detected and the amounts of SO_2 flux on each day were around 400 t/d and 300 t/d, respectively (Fig. 1). These amounts show a long term decreasing tendency and have remained relatively small since February 2013. According to a report from Miyake Village, relatively high concentrations of SO_2 were occasionally recorded in inhabited areas.

Geomagnetic observation revealed that there was no change in an inner-heat state beneath Miyakejima.

Volcanic seismicity has largely remained at low levels. Hypocenters were located just beneath the summit crater of Miyakejima as before. No tremors have been observed.

According to continuous GPS observation data, ground deformation indicating contraction in shallow parts of the mountain has continued since 2000, but has been gradually diminishing. Long-term extension of the baseline along the north-south section of Miyakejima has also been observed since 2006, indicating expansion in deeper parts.

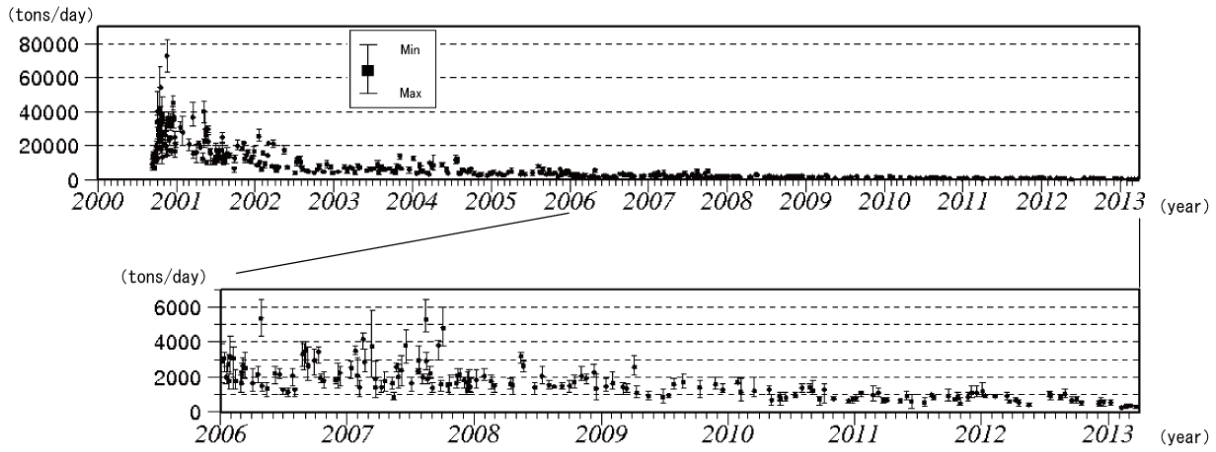


Fig. 1 SO_2 emission rate at Miyakejima.

Ioto (Near-crater Warning)

On March 6th, a new collapse pit was discovered at the Old-crater (known as Million Dollar Hole) located on the western part of the island. Several volcanic tremors with relatively large amplitudes were recorded from March 5th to 6th, indicating the occurrence of a very small phreatic eruption accompanied by collapse pit formation.

According to crustal deformation data obtained by GSI, ground deformation had been in an almost static state. However, slight uplift has been observed since around January 2013.

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

According to aerial observation conducted by the Japan Maritime Self-Defense Force (JMSDF) on March 8th, an area of milky-white and blue sea water discoloration with a radius of 500 m had formed around upwelling points due to volcanic activity.

Aerial observation conducted by the Japan Coast Guard (JCG) on March 26nd also revealed an area of milky-white, light-blue and light-green sea water discoloration measuring about 500 meters in width and 1,500 meters in length.

Discoloration and floating objects have been frequently observed in the waters surrounding Fukutoku-Oka-no-Ba in recent years, which are considered to be caused by volcanic activity. The latest submarine eruption occurred on 3rd February 2010.

Kirishimayama (Shinmoedake)(Alert Level: 3)

No eruptions were observed at Shinmoedake in the reporting period (the last explosive eruption occurred on March 1st, 2011, while the last eruption of any kind was on September 7th of the same year). As before, the white-plume height was less than 50 m above the crater rim.

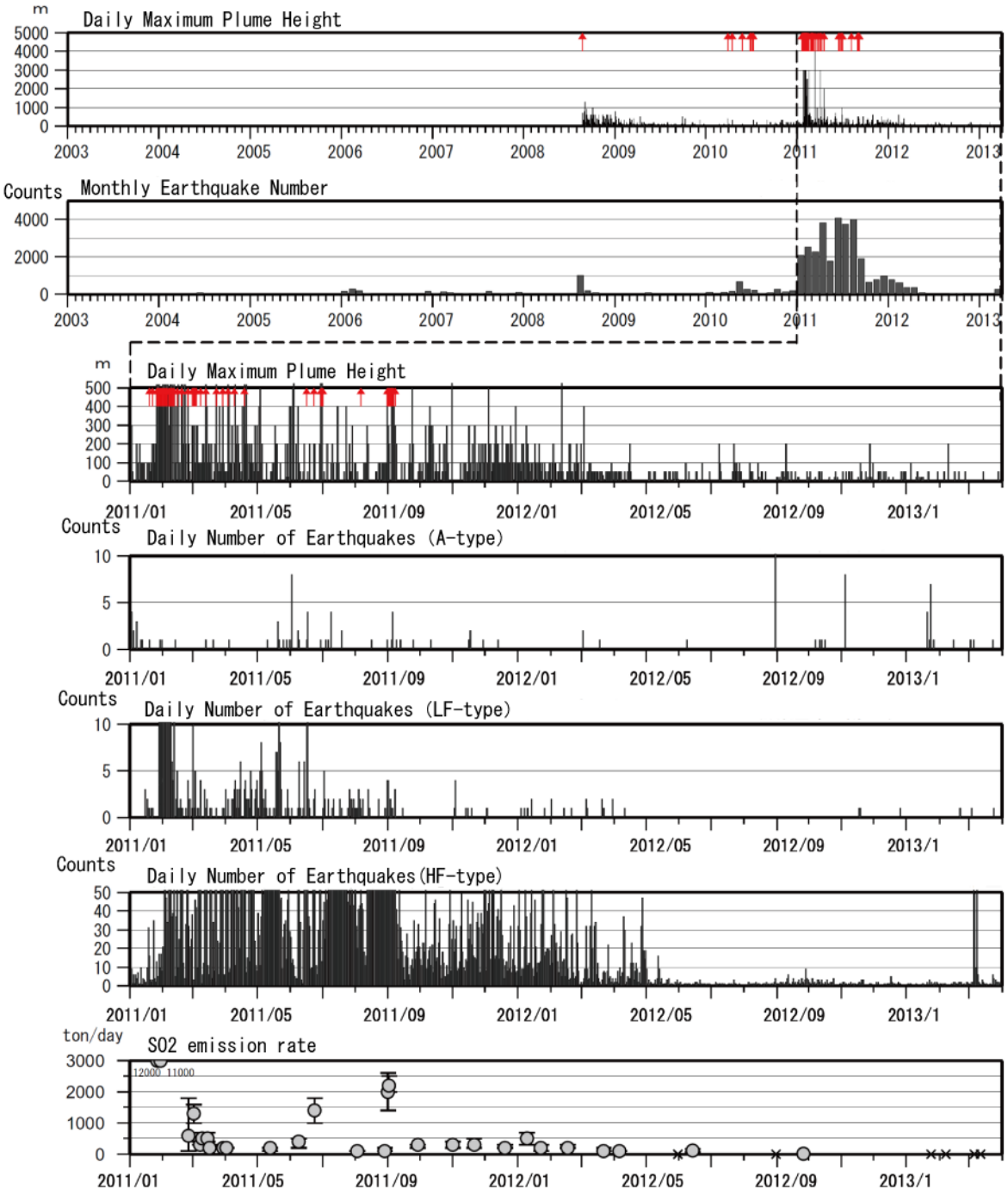
According to field surveys on March 6th and 12th, no significant amount of the sulfur dioxide (SO_2) was detected (no detection during previous survey on February 7th).

The incidence of small-amplitude volcanic earthquakes temporarily increased from March 5th to 8th. A total of 263 earthquakes occurred in March (25 in February), with hypocenters mostly estimated to be just beneath the crater of Shinmoedake. No volcanic tremors have been observed since March 2012.

According to regional deformation observations conducted by GSI, baseline extension caused by magma supply to a deeper chamber to the northwest of the crater has gradually slowed down to a static state since December

2011. However, baselines between Ebino and Makizono, as well as Makizono and Miyakonojo2 had shown a tendency to shorten slightly since May 2012, but have been in a static state since September of the same year.

Supply of magma from deeper parts to the magma chamber located several kilometers northwest of Shinmoedake has stopped. However, a large amount of lava has accumulated in the crater, and volcanic earthquakes have occasionally been observed. Based on this information, the possibility of small eruptions cannot be ruled out even now.



※ The notation "⬆" represents an eruption.

Fig. 2 Seismicity, plume activity and SO_2 emission rate at Shinmoedake from January 2003 to March 2013.

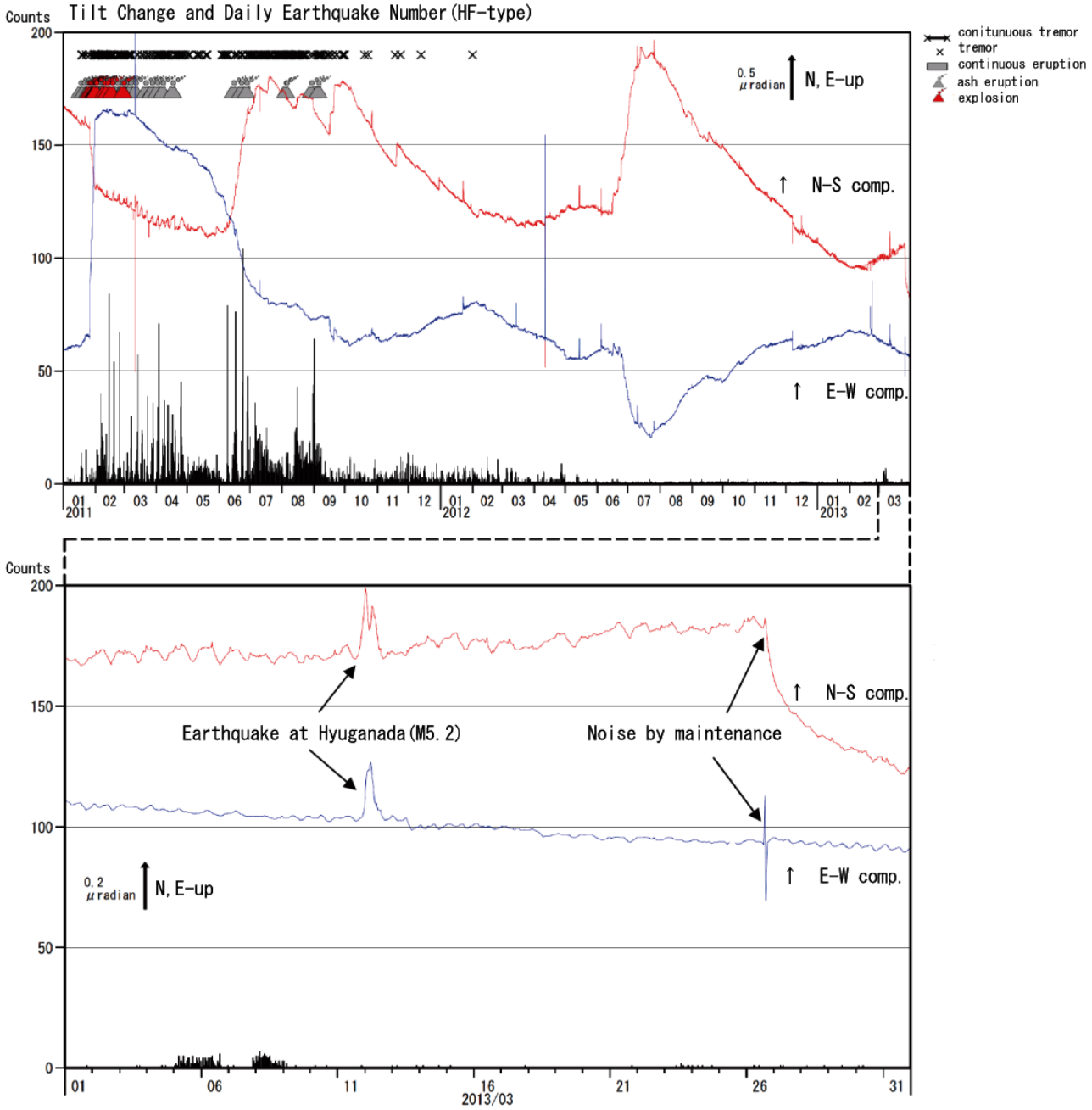


Fig. 3 Tiltmeter observation at Shinmoedake from January 2011 to March 2013.

Sakurajima (Alert Level: 3)

Eruption activity at the Showa crater has remained at high levels. During the reporting period, 74 eruptions were observed (132 in February), and 61 of them were explosive (119 in February), which remained at high levels. The explosive eruptions with ballistic rocks reaching third station (1,300 – 1,800 m from the Showa crater) occurred at 17:07 JST on March 11th. Clear volcanic glows in the Showa crater were sometimes recorded at night with high-sensitivity cameras. No eruption was observed at the Minamidake summit crater.

A total of 552 earthquakes occurred in March (746 in February), which remained at low levels. The number of tremors accompanying eruptions amounted to 321 in March (321 in February).

Field survey to measure SO_2 flux was conducted on March 21st. The SO_2 flux was approx. 2,800 t/d (approx. 800 t/d – 1, 900 t/d in February), showing high levels.

Regarding ground deformation of the mountain, the subsidence observed from around August 2012, stopped in January 2013 and turned to uplift in February according to observations made with a water-tube tiltmeter installed 2.5 km southeast of the Minamidake summit crater by Japan's Ministry of Land, Infrastructure, Transport and

Tourism (MLIT). The results of continuous GPS measurement show that baselines on Sakurajima Island shortened slightly after around October 2012, and that activity slowed around January 2013. Deformation observations made by GSI indicate that expansion in the deeper part of the Aira Caldera (in a closed-off section of Kagoshima Bay) remains in an almost-static state, while some baselines across the caldera have exhibited slight extension.

A total of 8 g/m^2 of volcanic ash fell on Kagoshima Local Meteorological Observatory (KLMO) in five days. The total amount of ashfall estimated from data provided by the Kagoshima prefectural government was about 0.8 million tons in February 2013, which was larger than the figure of 0.4 million tons recorded in January 2013.

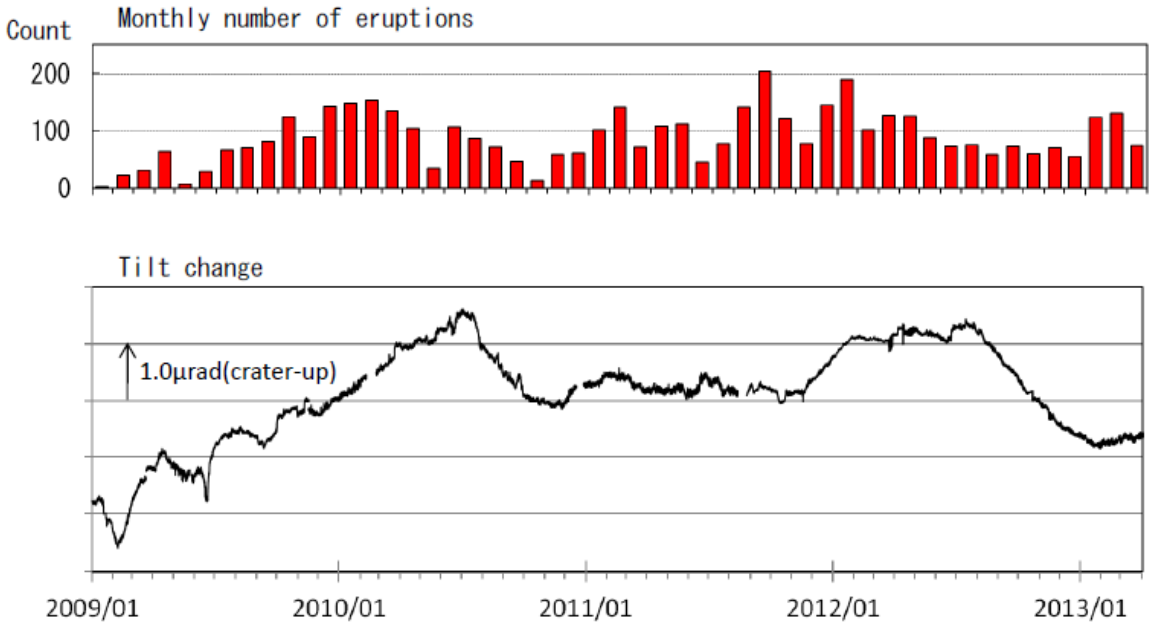


Fig. 4　Tilt change observed with a water-tube tiltmeter at Arimura Station from January 2009 to March 2013 with tidal response and eruptions eliminated. Upheavals of the summit side correspond to positive tilts. The red bars in figure denote monthly eruption frequencies at the Showa crater.

Suwanosejima (Alert Level: 2)

No eruptions occurred at the Otake crater in March. As before, the white plume height generally ranged from 200 to 300 m (max. 500 m) above the crater rim throughout most of the period. Weak volcanic glows in the crater were continually recorded at night with high-sensitivity cameras.

Seismic activity has remained at low levels. Volcanic tremors have occurred almost continuously since September 28th, 2012.

Etorofu-Yakeyama

A volcanic ash plume with a height of about 2,000 m above sea level was observed in meteorological satellite images on March 29th. It is considered that an eruption may have occurred in Etorofu-Yakeyama.