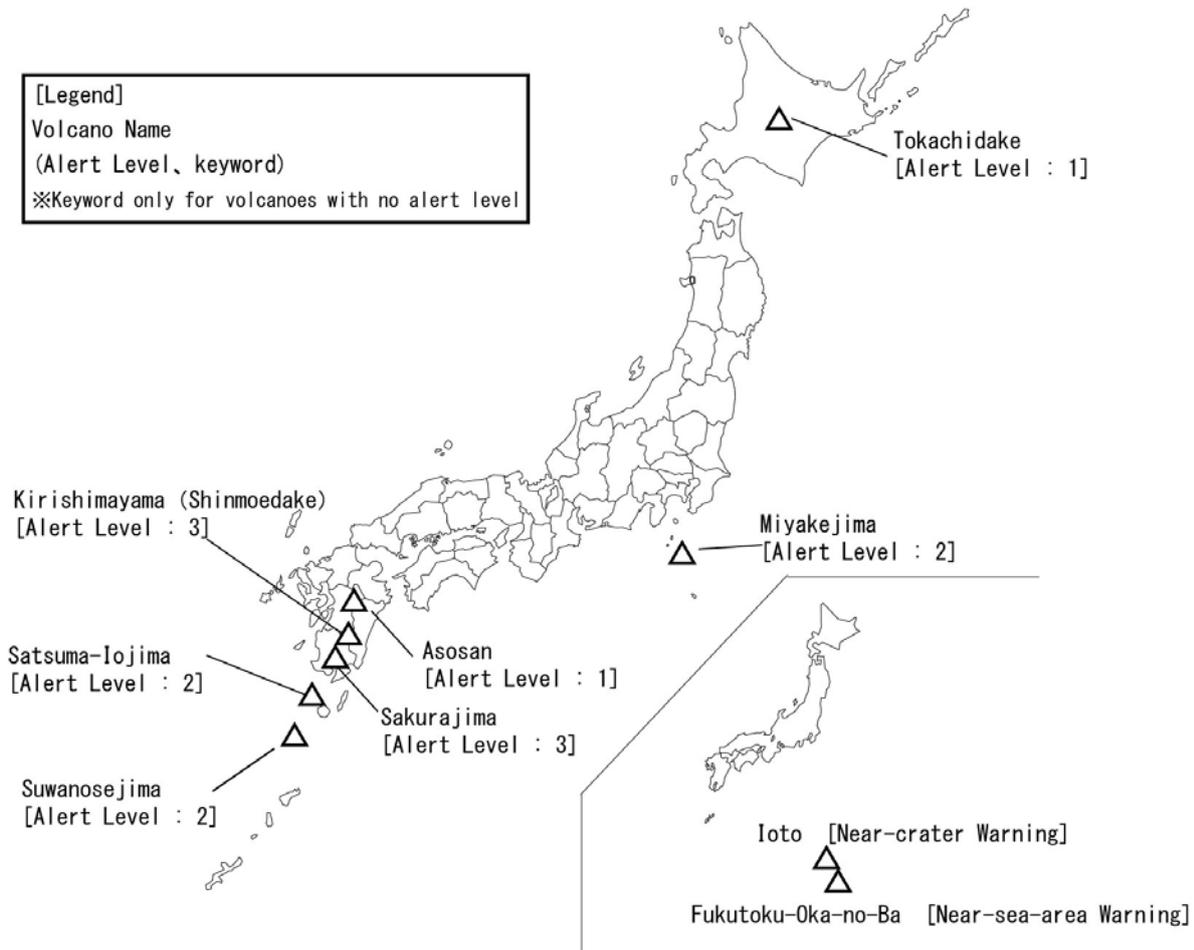


## Monthly Volcanic Activity Report (July, 2012)



### **Tokachidake [Alert Level: 1]**

Volcanic glows have been observed in the Taisho crater with a high-sensitivity camera at night from the night of June 30th to the early morning of July 5th. These glows are considered to be due to the outburst of high-temperature volcanic gases and burning of sulfur. No changes in volcanic earthquakes, tremors, ground deformation and infrasonic data have been observed in local conditions before or after this phenomenon.

Observations from foot of the mountain and aerial observations with an infrared camera conducted in conjunction with the Hokkaido prefectural government before noon of July 1st revealed that high-temperature areas in geothermal locations were located on the eastern wall of the Taisho crater. Observations from foot of the mountain on July 4th, 7th, 18th, observations from near the crater on July 8th and aerial observations with an infrared camera conducted in conjunction with Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT) on July 20th revealed that there was a small new fumarole around an existing fumarole at the eastern wall of the Taisho crater. High-temperature areas diminished and returned to the state of before June 30th.

The volume of fume from Taisho crater increased temporarily from the morning of July 1st to 2nd and volcanic gases emitted from this crater flowed down to the northeastern slope of Tokachidake. According to a field survey result on July 1st, the amount of the sulfur dioxide (SO<sub>2</sub>) flux was 600 t/d. Though no field survey was conducted after July 3rd because of bad weather, we

gathered from diminished volume of fume that the amount of the SO<sub>2</sub> flux from Taisho crater was decreased.

No change of plume was observed at the 62-2 crater.

A small-amplitude and short-duration volcanic tremor was observed at 7:58 p.m. on July 11th. After that, small-amplitude volcanic earthquakes increased temporarily until the morning on July 12th. No change in fume, infrasonic data and ground deformation data accompanying this tremor have been observed in local conditions. Hypocenters were located just beneath the shallow part of the Ground crater and the old crater.

According to GPS observation data, ground deformation at Maetokachi indicating the inflation of shallow part at 62-2 crater was found. No change indicating ground deformation in more large areas was observed.

### Miyakejima [Alert Level: 2]

Gas-and-steam plumes rose to a height of 100 – 200 m above the crater rim. According to field survey results on July 17th and 19th, the amount of the sulfur dioxide (SO<sub>2</sub>) flux was approx. 1000 t/d and 900 t/d respectively (approx. 400 t/d on May 17th; Fig. 1), indicating that concentrations of volcanic gas remained higher than usual. According to a report from Miyake Village, relatively high concentrations of SO<sub>2</sub> were occasionally recorded in inhabited areas.

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

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

According to GPS observation data, ground deformation indicating contraction in shallow parts of the mountain has continued since 2000, but is 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.

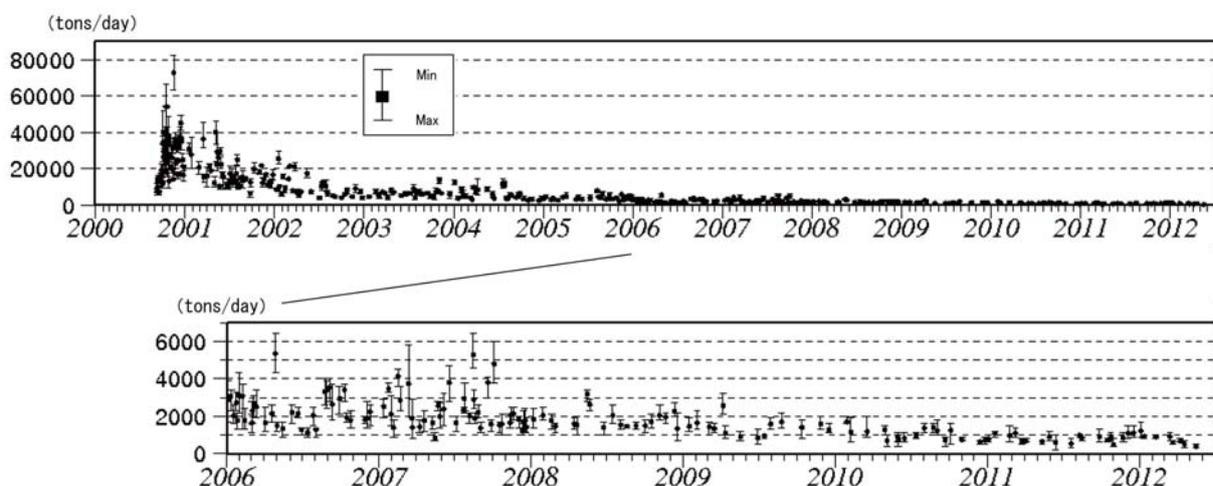


Fig. 1 SO<sub>2</sub> emission rate at Miyakejima

### **Ioto [Near-crater Warning]**

According to a report from Japan Maritime Self-Defense Force (JMSDF), white plumes rose up to 15m at old crater in the west of the island (so-called: Million dollar hole) at 12:15 a.m. on July 9th, and mud scattered as far as tens of meters around the crater at 1:30 p.m. on July 9th. No plumes were observed. Although no seismic earthquakes and air vibrations were observed during these events, very small phreatic eruption was estimated to happen. While very small phreatic eruptions at old crater in the west of the island have occurred in early February, early March and early April, the scale of the eruption on July was inferred to be smaller than that of the eruption in early February, 2012.

Volcanic activity of Ioto became more active from late April to early May. According to deformation observation by the Geospatial Information Authority (GSI), rapid uplift changed to subsidence, and ground deformation is now in an almost static state. Seismic activity has diminished. Volcanic tremors occurred once on July 22nd and twice on July 23rd, and monochroic volcanic tremor occurred once on July 26th, 27th, 28th and 30th respectively. The tremor duration for July was 1m30s – 11m. No change in volcanic earthquakes, infrasonic data and surface phenomenon were observed in this period. Volcanic tremor was observed for the first time since May 3rd, 2012.

Because of technical failure, a camera placed at Asodaihigashi (about 900 m east-northeast of the Asodai depression hole) showed no images of Asodai depression hole in the west of the island and Idogahama in the northeast.

### **Fukutoku-Oka-no-Ba [Near-sea-area Warning]**

According to information from the Japan Coast Guard (JCG), JMSDF and the Japan Meteorological Agency (JMA), discoloration has been frequently observed in the waters surrounding Fukutoku-Oka-no-Ba in recent years.

### **Asosan [Alert Level: 1]**

The maximum white-plume height was 400 m above the crater rim as before. The volume of hot water began to fall in late May, and had dropped to 30 percent of its previous level by mid-June. Because of heavy rains, the volume of hot water increased by around 90 percent (30 – 70 percent in June) in late July. The surface temperature was 58 – 66°C (67 – 73°C in June). Hot water was observed to be blowing out of the center of the crater. The highest temperature of the southern crater wall was 213 – 250°C (246 – 260°C in June), which was the same level as before. No change in the southern crater wall was detected from infrared observation.

Isolated volcanic tremors and seismicity have remained at low levels, but have shown a slightly increasing tendency since February 2012. There were 669 isolated volcanic tremors in July (621 in June) and 626 instances of seismic activity (369 in June). Most hypocenters were located in the shallow underground of Nakadake and at 2-4km beneath an area around 6km northeast of Nakadake. There was of no tremor in July (4 in June).

No change was shown by GPS observation.

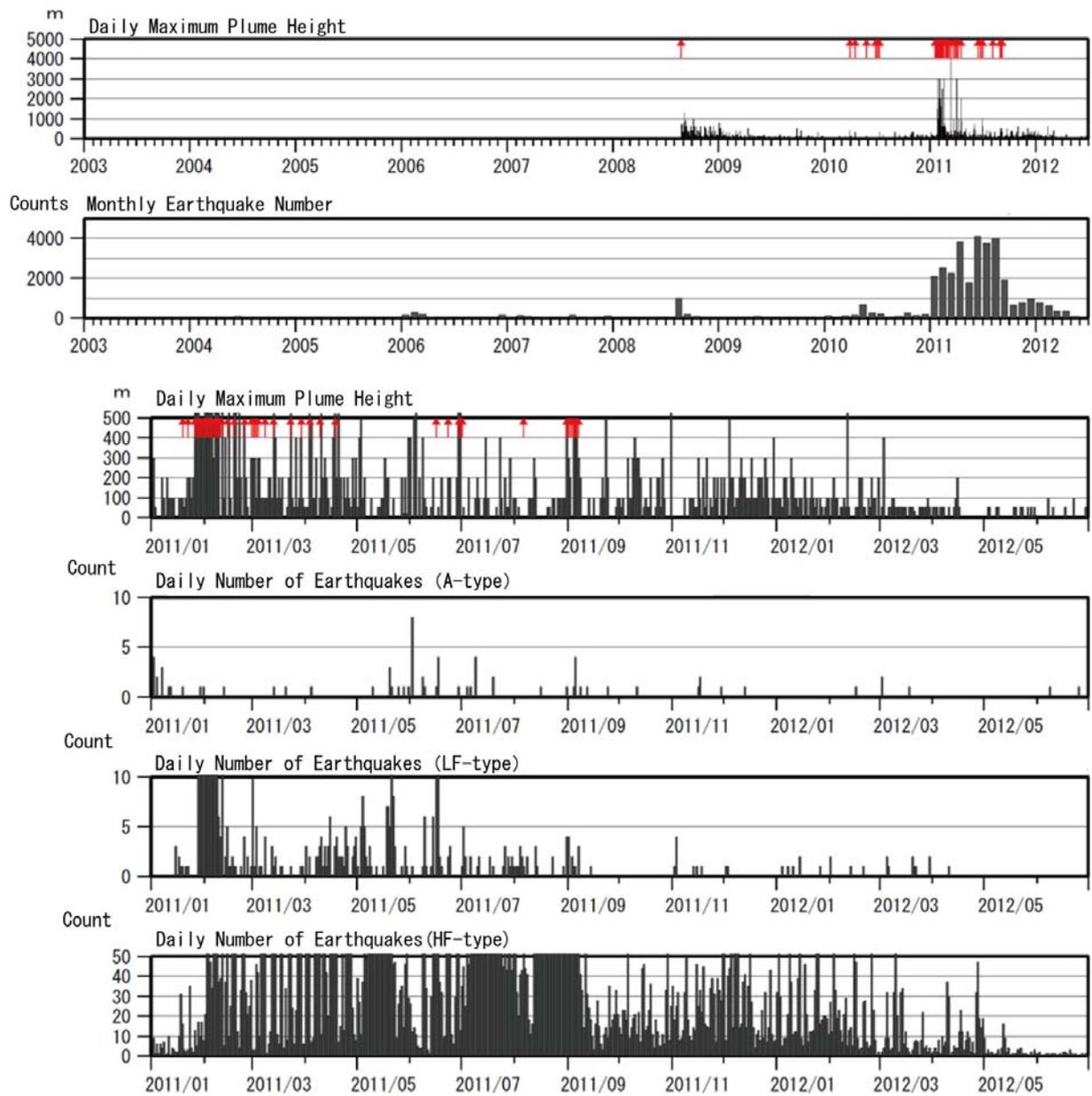
A field survey conducted on July 10th revealed that the amount of the sulfur dioxide (SO<sub>2</sub>) flux was approx. 400 t/d (approx. 600 t/d – 800 t/d on May).

### **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 approximately 200m on average above the crater rim.

A total of 17 volcanic earthquakes occurred in July (23 in June). No volcanic tremors were observed in July (as in June).

According to wide-area deformation observations conducted by GSI, baseline extension caused by magma supply to a deeper chamber several kilometers northwest of the crater gradually slowed from December 2011 and had shown little change since January 2012. However, baseline between Ebino and Makizono has shown a tendency to shorten slightly since May as well as baseline between Makizono and Miyakonojo2 since June. There was no remarkable change related to volcanic activity in local conditions according to the results of tiltmeter-based observation and narrow-area GPS measurement conducted around Shinmoedake.



※ The notation “↑” represents an eruption.

Fig. 2 Seismicity and plume activity at Shinmoedake from January 2003 to July 2012

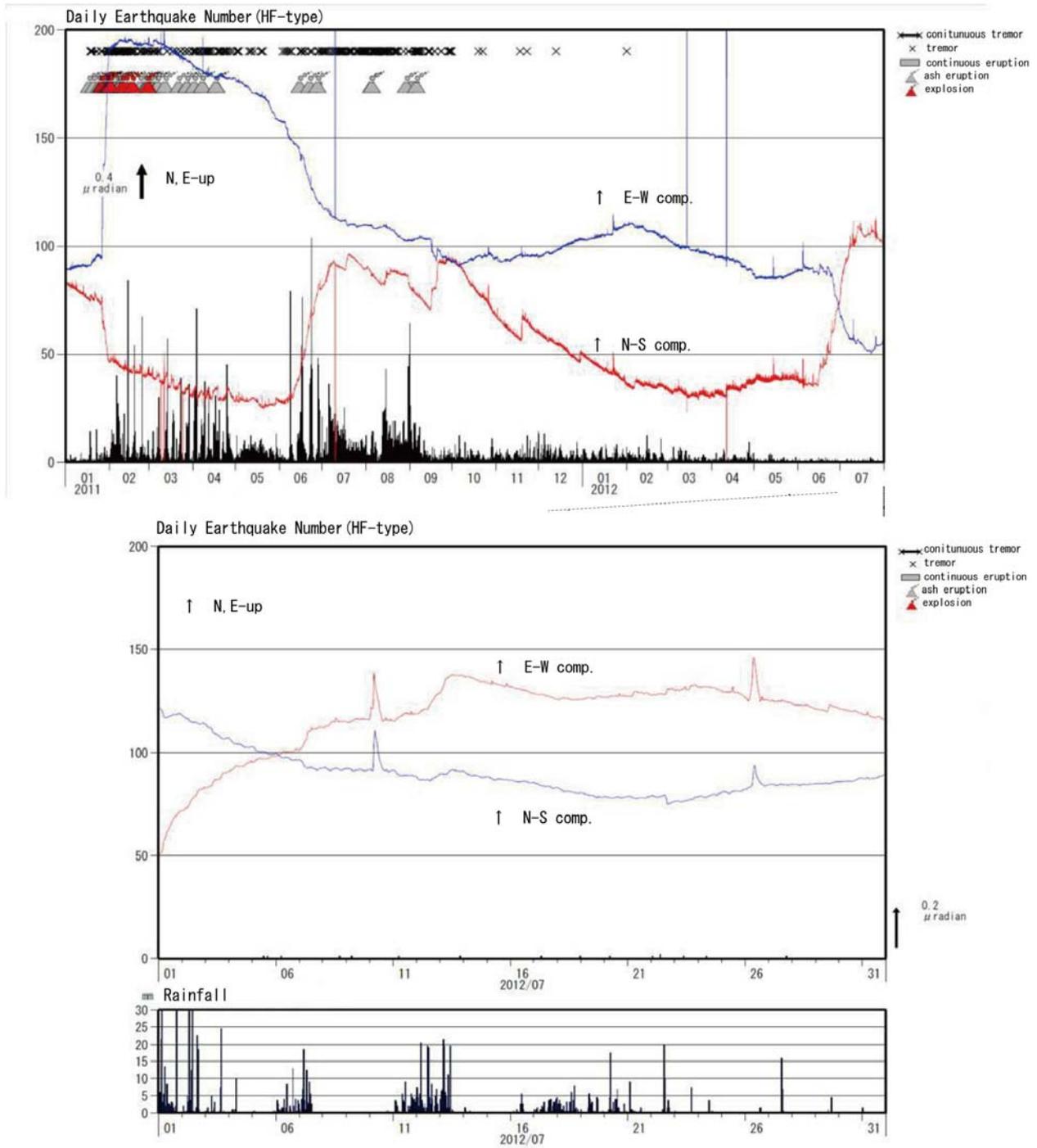


Fig. 3 Tiltmeter observation at Shinmoedake from January 2011 to July 2012

### **Sakurajima [Alert Level: 3]**

Explosive eruption occurred at Minamidake summit crater at 7:15 p.m. on July 24th. Large volume of plume rose up and ballistic rocks reached fourth station (1,300-1,700m from Minamidake summit crater). Explosive eruption at Minamidake summit was seen for the first time since February 7th, 2011.

Eruption activity at the Showa crater has remained at high levels. During the reporting period, 76 eruptions were observed (73 in June), 60 of which were explosive (51 in June). Explosive eruption has increased temporarily since the explosive eruption at Minamidake summit on July 24th, recording 9 times on 25th and 8 times on 26th. Ballistic rocks reached third station (1,300 – 1,800 m from the Showa crater) at 5:31 a.m. on July 7th. When explosive eruptions occurred at 2:21 p.m. on July 26th, significant plume rose to a height of 3,200 m above the crater rim. No pyroclastic flow was observed. Volcanic glows were clearly recorded at night with a high-sensitivity camera sometimes.

Volcanic seismicity has remained at a relatively low level. A total of 713 earthquakes occurred in July (924 in June). The number of tremors accompanying eruptions amounted to 473 in July (544 in June) with a total duration of 56 h 52 m, which was about the same as that in June (61 h 32 m).

According to field surveys conducted on July 4th, 17th, 18th and 24th, the average SO<sub>2</sub> flux was approx. 1,800 t/d – 3,100 t/d (approx. 1,800 t/d– 3,600 t/d in June), and remained at high levels. On July 31st, a field survey found the average SO<sub>2</sub> flux 5,200 t/d and at very high levels.

The slight upheaval of the mountain seen from November 2011 onward stopped in February 2012 according to observations made with a water-tube tiltmeter installed 2.5 km southeast of the Minamidake summit crater by MLIT. Prior to the explosive eruption at Minamidake summit crater at 7:15 p.m. on July 24th, small deformation was observed, which seemed to be caused by inflation of the shallow part of the mountain. After the eruption, rapid contraction was observed.

The results of continuous GPS measurement have shown that slight extension inside Sakurajima Island had continued since around September 2011 and stopped in February 2012. Based on deformation observations made by GSI, long-term extension of the baselines that traverse the Aira Caldera (in a closed-off section of Kagoshima Bay) has been observed, indicating expansion of the deeper magma chamber beneath the caldera.

A total of 293 g/m<sup>2</sup> (9 days) of volcanic ash has fallen on Kagoshima Local Meteorological Observatory (KLMO). Based on observation data provided by the Kagoshima prefectural government, the total estimated amount of ashfall was 690,000 tons in June 2012.

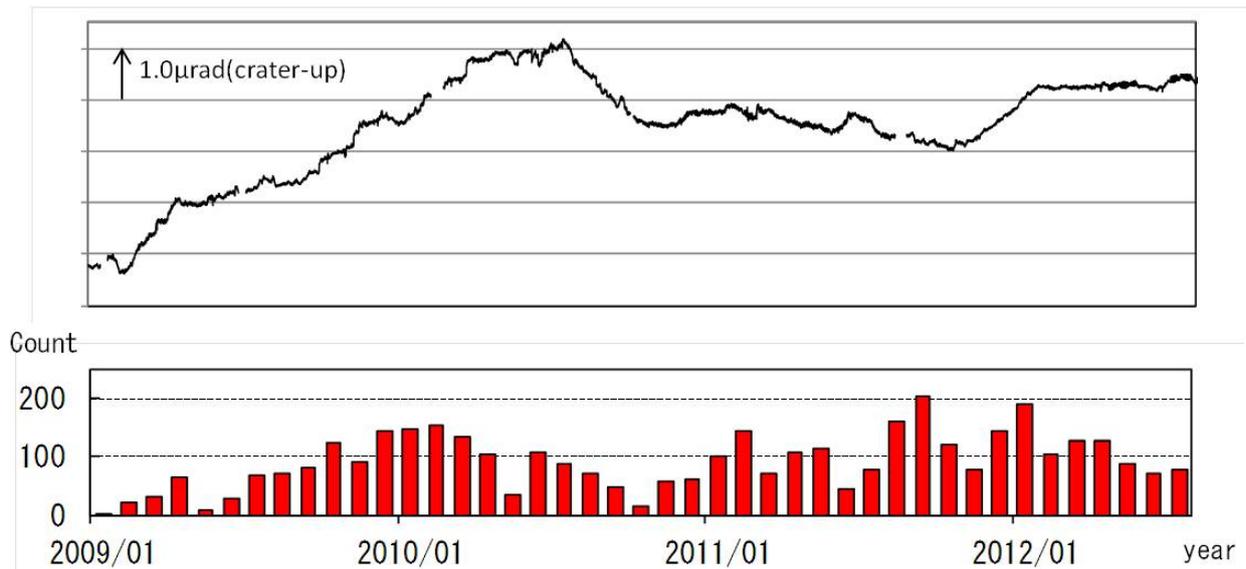


Fig. 4. Tilt change observed with a water-tube tiltmeter at Arimura Station from January 2009 to July 2012 with tidal response and eruptions eliminated. Upheavals of the summit side correspond to positive tilts. The red bars in the bottom figure denote monthly explosion frequencies at the Showa crater.

#### **Satsuma-Iojima [Alert Level: 2]**

Plume activity at the Iodake summit crater remained at relatively high levels, and a white plume rose to as high as 800 m above the crater rim during the reporting period. Weak volcanic glows were recorded at night with a high-sensitivity camera on July 22nd.

Seismic activity remained at low levels, with 238 events (204 in June). No volcanic tremor was observed in July (1 in June).

No unusual ground deformation was seen in GPS observation data.

#### **Suwanosejima [Alert Level: 2]**

No explosive eruptions occurred in July (as in June). The maximum plume height was approx. 400 m above the crater rim during this period (approx. 300 m in June). Weak volcanic glows in the crater were recorded at night with a high-sensitivity camera on July 20th-25th and 28th-29th.

Seismic activity remained at low levels, with 29 A-type events (21 in June) and 123 B-type events (116 in June). Volcanic tremors occurred on July 24th – 25th, and the total tremor duration for July was 38 h 5m, which was less than that in June (132 h 24 m).

At Otake crater, no eruption was observed during this period, but the crater has been erupting repeatedly over a long time.