

II. Eruptive Events

1. General Statement

Volcanic activity for the period 1999-2002 was characterized by the two large eruptive activities at Usu volcano and Miyakejima volcano, and other eruptions and phenomena.

Earthquake swarm began at Usu volcano on 27 March 2000. Remarkable ground deformation was accompanied at the summit and in the northwestern area of Usu volcano. Phreatomagmatic eruption took place about 4 km NW apart from the summit of Usu volcano at 13:07, 31 March 2000. Eruption continued at two crater areas, West-Nishiyama and Kompirayama, forming many new craters. Remarkable inflation occurred and a cryptodome was formed near the West-Nishiyama crater area during the eruptive activity. Eruptive activity and deformation gradually declined but small phreatic explosions continued at one of Kompirayama craters until September 2001. As the people living near the volcano and tourists were required to evacuate before the eruption, no people were injured. Detailed information is described in II-3.

Earthquake swarm began at Miyakejima volcano on 26 June 2000. The hypocenters of the earthquakes migrated westward and submarine eruption occurred off the western coast of Miyakejima island on 27 June. The hypocenters migrated more westward and vigorous earthquake swarm continued near Nii-jima and Kozu-jima. On the other hand, earthquake swarm began just beneath the summit of Miyakejima (Oyama) on 4 July and small eruption occurred at the summit on 8 July. After the summit eruption, a large collapsed crater, about 1 km across and about 200 m deep, was found on the summit. Collapse of the crater continued and a summit caldera of 1.4 km across and 450 m deep was formed until early August. Large eruptions occurred at the summit on 10, 18 and 29 August. Volcanic smoke from the eruption on 18 August reached 14 km height from the summit and low temperature pyroclastic flow from the eruption on 29 August reached the northern coast of Miyakejima. Active eruption continued until early September and SO₂ flux from the craters within the Miyakejima summit caldera continued in high level. Lahar sometimes occurred when it rained. All people who lived in Miyakejima island have been evacuated since September 2000. Detailed information is described in II-4.

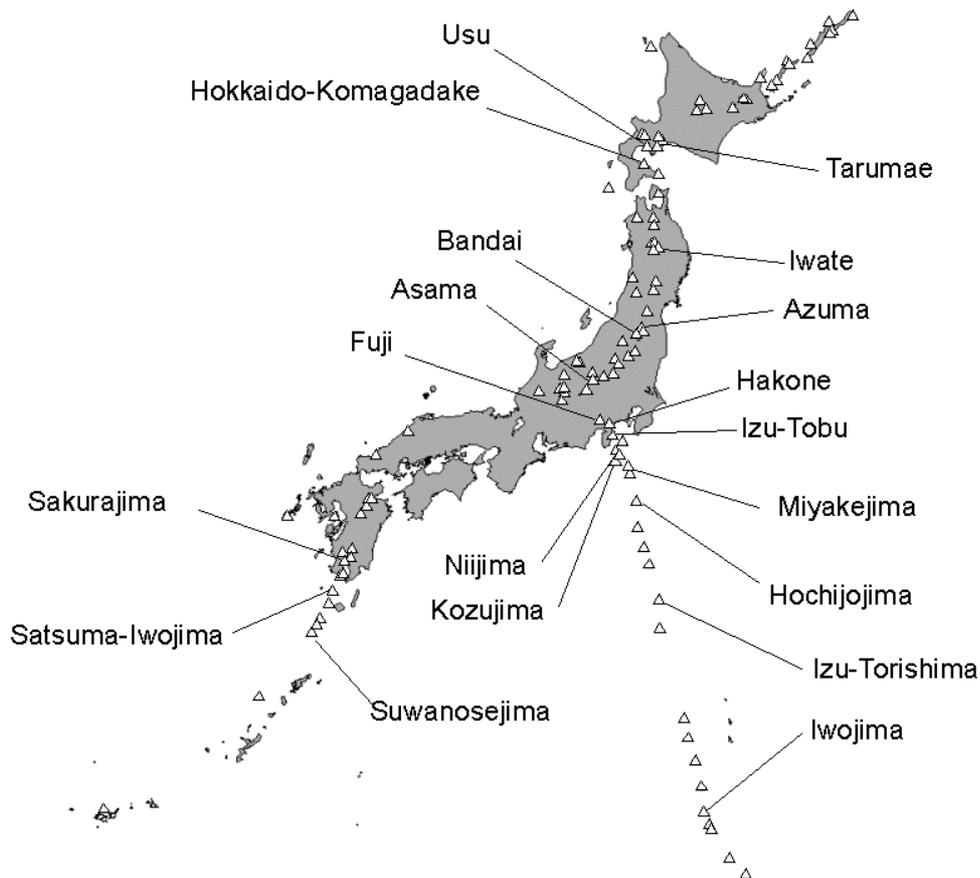


Fig. 1. Index map showing the location of active volcanoes listed in this report. Triangles represent active volcanoes in Japan. Japan Meteorological Agency has defined active volcanoes in Japan as “volcanoes which have erupted within 10,000 years or volcanoes with vigorous fumarolic activity”.

Table 1. Chronology of volcanic eruptions and related events during 1999-2002.

1999	
May	Fumarolic activity at Iwate volcano became active.
2000	
27 March	Earthquake swarm began at Usu volcano.
31 March	Phreatomagmatic eruption started at Usu volcano.
May	Earthquake swarm at Bandai volcano, until 2001.
26 June	Earthquake swarm began at Miyakejima volcano.
27 June	Submarine eruption near Miyakejima volcano
4 July	Earthquake swarm began at the summit of Miyakejima volcano.
8 July	Small eruption and collapse at the summit of Miyakejima volcano
10, 18, 29 August	Large-scale phreatomagmatic eruptions at Miyakejima
August	High flux of SO ₂ at Miyakejima volcano, until now
September	Small phreatic eruptions at Hokkaido-Komagadake volcano (until November)
October	Deep low frequency earthquakes at Fuji volcano, until May 2001
December	Eruptive activity became active at Suwanosejima volcano.
2001	
May	Earthquake swarm at Azuma volcano, until 2002.
21 September	Small submarine eruption near Iwojima
19 October	Small phreatic eruption at Iwojima
2002	
May	Earthquake swarm at Izu-Tobu volcano
August	Small eruptions at Izu-Torishima volcano
August	Earthquake swarm at Hachijojima volcano

Two persistent active volcanoes in Japan, Sakurajima and Suwanosejima, also erupted. At Sakurajima volcano, explosive eruptive activity continued (see II-2). The volcanic activity at Suwanose-jima volcano became active since December 2000. At Satsuma-Iwojima volcano, intermittently discolored plumes were issued from the summit and high SO₂ flux continued.

Small phreatic eruptions occurred at Hokkaido-Komagadake volcano between September and November 2000. Small submarine eruption and phreatic eruption occurred at Iwojima in September and October 2001. Small eruption occurred also at Izu-Torishima in August 2002.

High volcanic activities without eruption were observed at several active volcanoes in Japan.

High seismicity and inflation began at Iwate volcano in March 1998. The seismicity gradually declined but continued for the period 1999-2002. Fumarolic activity at western Iwate volcano gradually became active since March 1999 and continued. Detailed information is described in II-3.

Seismicity that began since June 2000 near Nii-jima and Kozu-jima was the most active earthquake swarm in recent years. The number of earthquakes of the magnitude more than 4 was more than 600. Remarkable ground deformation occurred associated with the earthquake swarm. Seismic activity and ground deformation were observed also at Hakone volcano during June to August 2001, at Izu-Tobu volcanoes in May 2002, and at Hachijojima volcano in August 2002. At Hachijojima volcano, very long-period seismic events occurred (Ueno *et al.*, 2002). Seismicity became active at Bandai and at Azuma volcanoes since May 2000 and May 2001, respectively.

High temperature at the summit was observed at Tarumae volcano during the period 1999-2002.

B-type earthquake swarm intermittently occurred at Asama volcano since September 2000. Volcanic gas emission from the summit crater gradually increased since May 2002.

Deep low frequency earthquakes (deeper than 10 km) occurred beneath some active volcanoes. Seismicity of deep low frequency earthquakes beneath Fuji volcano became active since October 2000 to May 2001 (see II-5).

During the period 1999-2002, no persons were killed by volcanic activity in Japan, excepting 1 person who was killed by an earthquake near Nii-jima and Kozu-jima region..

Preliminary reports on current eruptions in Japan were pasted in the internet web site; "Current Eruptions in Japan";

<http://hakone.eri.u-tokyo.ac.jp/vrc/erup/erup.html>.

The information on Japanese volcanoes was given in the site of Japan Meteorological Agency;

<http://www.jma.go.jp/>. (revised everyday but in Japanese)

Additional information on eruptions in Japan was available in the following home pages;

Geological Survey of Japan; <http://www.gsj.jp/HomePage.html>,

Geographical Survey of Japan; <http://www.gsi.go.jp/ENGLISH/index.html>,

National Research Institute for Earth Science and Disaster Prevention; <http://www.bosai.go.jp/index.html>,

Tatsuro Chiba; <http://www.geo.chs.nihon-u.ac.jp/tchiba/chibah.html>, and
Yukio Hayakawa; <http://www.edu.gunma-u.ac.jp/~hayakawa/English.html>.

Internet web sites of volcano observatories in Japan are as follows;

Usu (UVO), Hokkaido Univ.; <http://uvo.sci.hokudai.ac.jp/>,

Res. Cent. Pred. Earthq. Volc. Erup., Tohoku Univ.; http://aob-new.aob.geophys.tohoku.ac.jp/index_e.html,

VRC, Earthq. Res. Inst., Univ. Tokyo; <http://hakone.eri.u-tokyo.ac.jp/vrc/VRC.html>,

Volcanic Fluid Research Center of Tokyo Institute of Technology; <http://www.ksvo.titech.ac.jp/index.html> #,

Res. Cent. Seism. Volcanol., Nagoya Univ.; <http://www.seis.nagoya-u.ac.jp/RCSVNU-E.html>,

Aso (AVL)-Kyoto Univ.; <http://w3.vgs.kyoto-u.ac.jp/> #,

Sakurajima (SVO)-Kyoto Univ.; http://www.dpri.kyoto-u.ac.jp/~kazan/default_e.html,

Unzen (SEVO)-Kyushu Univ.; <http://www.sevo.kyushu-u.ac.jp/index-e.html>.

open in Japanese

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References

Ueno, H., Ikeda, Y., Hasebe, D., Kamigaichi, O., Hoshiya, M. and Yoshida, Y. (2002) Earthquake activity and long-period events occurred around Hachijojima Island from August 2002. *Newsletter of Seism. Soc. Japan*, **14-4**, 3-5 (in Japanese).