

Recent unrest and small eruption in February 2003 at Asama volcano

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Asama volcano has been relatively active; B-type earthquakes have intermittently increased since September 2000. The volcanic activity in June 2002 was more active showing the increasing number of earthquakes, the amount of volcanic smoke and gas emission. Temperature of the crater bottom was also increased in a same time. Although these activities slightly declined since the end of September 2002, it activated again in February 2003. A small-scale eruption took place on 6 Feb. and a small amount of volcanic ash was ejected near the summit.

We will report on the recent activity of Asama volcano based on JMA's observation.

The B-type quakes located just below the summit have been active since Sep. 2000. The number of earthquakes was around 100 to 200 times/month before Sep. 2000. In June 2002, however, the monthly number reached about 1,400 throughout June to Sep. 2002. Five small-scale monochromatic tremors took place on 15 Sep. 2002. The seismicity slightly declined since October 2002 keeping relatively high level.

For 11 days before the eruption, 3 monochromatic earthquakes, a small-scale B-type earthquakes swarm (23 quakes within 33 minutes) and a moderate A-type quake were observed. The total number of earthquakes, however, slightly declined between January 31 and the day of eruption. A small tremor was observed associated with the eruption.

In June 2002, A-type quakes located at around 3km west from the summit and about 2km deep became temporarily active occurring 30 events/month, but this activity decreased since then and keeping less than 20 events per month.

Asama volcano is continuously emitting white volcanic smoke from the summit crater and have been continuously monitored by two video cameras installed in north and south foot respectively. The volcanic smoke mostly reached up to 300 to 400m above the crater after the eruption in 1990. Since May 2002, it was gradually activated, and smoke rose 1,000m in June, then 1,500m in August. After declination at the end of Sep., the volcanic smoke increased again in Feb. 2003. A small amount of white-gray smoke was ejected and reached 300m above crater at around 12:01, 6 Feb. 2003. Ejection of volcanic ash stopped within several minutes. A little ashfall was detected near the summit area by the helicopter observation.

Heat discharging rate estimated from pictures of video cameras also showed an increase between May and Aug. 2002. It declined steeply in Sep. and increased again since Oct. 2002.

In July 2002, the increase of volcanic gas was suggested by discolorment of plants around northeast hillside of Asama volcano. According to the monthly measurement of SO₂ flux carried out by COSPEC, the released amount of SO₂ was over 2,000 tons/day in July and August 2002. It was decreased since Sep. and was less than 500 tons/day at the beginning of October. Since then, about 1,000 tons/day of SO₂ had been measured. The maximum SO₂ flux of 1,900-2,700 tons/day was observed on the next day of eruption. The COSPEC measurements have been carried out with the traversing method.

Since July 2002, the high-temperature area near a fumarole of crater bottom has been confirmed by a high-sensitivity camera and an infrared camera located at the crater rim. Temperature of the crater bottom had been below 100 degrees before 2002. However, it increased to 128-176 degrees in May and June 2002. Weak red glows were observed in 7 and 11 Sep. by a high-sensitivity camera and were not visible to the naked eye.

The geodetic observation by GPS (3 sites installed within 7.5km from the crater) and a tiltmeter (2.5km apart from the crater) have not been shown significant changes considered to be caused by volcanic activity since October 2000.

The eruption on 6 Feb. is estimated to be smaller scale than the last one in July 1990, taking into account recorded amplitude and duration of volcanic tremor associated with it and distributed area of ejected volcanic ash.