

## 43. Harunasan

Latitude: 36°28'38" N, Longitude: 138°51'03" E, Elevation: 1,449 m  
(Kamongatake) (Elevation Point)

Latitude: 36°28'37" N, Longitude: 138°52'42" E, Elevation: 1,390 m  
(Haruna-Fuji) (Triangulation Point)



Overview of Harunasan taken from Maebashi on December 4, 2003 by the Japan Meteorological Agency

### Summary

Harunasan is a large composite volcano with a base diameter of approximately 20 km. At the top of the heavily-eroded main stratovolcano with pyroxene andesite composition, there is a small caldera, 2 km x 3 km in diameter, and are several hornblende-dacite post-caldera lava domes. The volcano has a complex history of its activity. After the building of the main stratovolcano, the volcanic edifice was collapsed and reformed. Several pyroclastic flows were erupted, as the calderas were formed twice. There are also several lava domes aligning east-west from the center of the caldera, Haruna-Fuji, to the east slope of the main volcanic edifice, at which the youngest lava dome, Futatsudake sits. The Ikaho Onsen hot spring locates at the northern base of Futatsudake, but there is no fumarolic activity near the summit. The SiO<sub>2</sub> content of the lavas of Harunasan ranges between 50.6 and 74.6 wt %.

### Red Relief Image Map

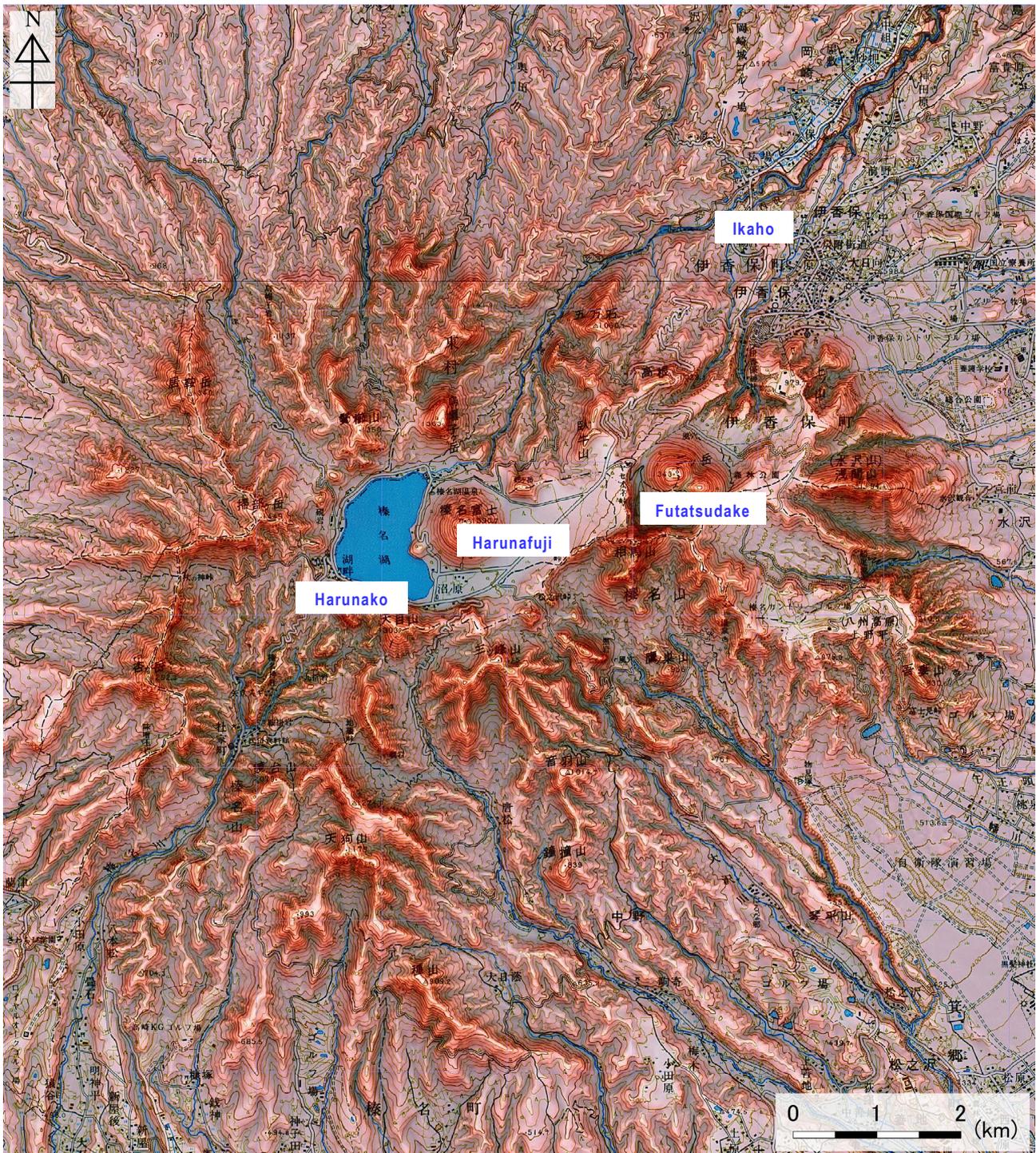


Figure 43-1 Topography of Harunasan.

1:50,000 scale topographic maps (Harunasan and Nakanojo) and digital map 50 m grid (elevation) published by the Geospatial Information Authority of Japan were used.



## Chronology of Eruptions

### ▪ Volcanic Activity in the Past 10,000 Years

A collapse (the Miyukida debris avalanche) occurred on the east side of the volcanic edifice approximately 10,000 years ago. This was immediately followed by the formation of the Mizusawayama lava dome. There was no prominent volcanic activity since this event, but activity resumed in the 5<sup>th</sup> century, and 3 eruptions occurred in the mid-6<sup>th</sup> century. Two of the eruptions in the 6<sup>th</sup> century were large-scale eruptions, producing a large volume of air-fall pyroclastic and pyroclastic flow material. The current Futatsudake lava dome was formed by the most recent eruption (Soda, 1998).

Period	Area of Activity	Eruption Type	Main Phenomena / Volume of Magma
13.3←→9 ka	Mizusawayama	(Collapse, lahar production) → magmatic eruption	Mizusawayama lava dome eruption: Debris avalanche, lahar → lava dome.
3.7←→3.4 ka	Futatsudake area	(Lahar production)	Lahar.

\* Volcanic periods, areas of activity, and eruption types taken from the Active Volcano Database of Japan, AIST (Kudo and Hoshizumi, 2006 ). All years are noted in Western date notation. "ka" within the table indicates "1000 years ago", with the year 2000 set as 0 ka.

A←→B: Eruption events taking place at some point between year A and year B

### ▪ Historical Activity

There are no records of volcanic activity.

3 eruptions are confirmed, based on the relationships between ejecta and archaeological remains.

Year	Phenomenon	Activity Sequence, Damages, etc.
400 ←→ 500	Phreatomagmatic eruption	Futatsudake Arima volcanic ash eruption: Tephra fall.
489 ←→ early summer, 498	Large: Phreatomagmatic eruption → (lahar)	Futatsudake Shibukawa eruption: Tephra fall / pyroclastic flow → lahar. The eruptive activity occurred at the Futatsudake crater. There was a phreatomagmatic explosion, phreatic explosion, and pyroclastic flow, etc. from the area around the current Futatsudake. Magma eruption volume = 0.32 km <sup>3</sup> DRE. (VEI 4)
525 ←→ early summer, 550	Large: Magmatic eruption → phreatomagmatic eruption → magmatic eruption → (lahar)	Futatsudake Ikaho eruption: Tephra fall / pyroclastic flow → lava dome, lahar. The eruptive activity occurred at the Futatsudake crater. A Plinian eruption ejected air-fall pumice and pyroclastic flow, and the Futatsudake lava dome was formed. Magma eruption volume = 0.74 km <sup>3</sup> DRE. (VEI 5)

\* Volcanic periods, areas of activity, and eruption types taken from the Active Volcano Database of Japan, AIST (Kudo and Hoshizumi, 2006 ).

A←→B: Eruption events taking place at some point between year A and year B

### Recent Volcanic Activity

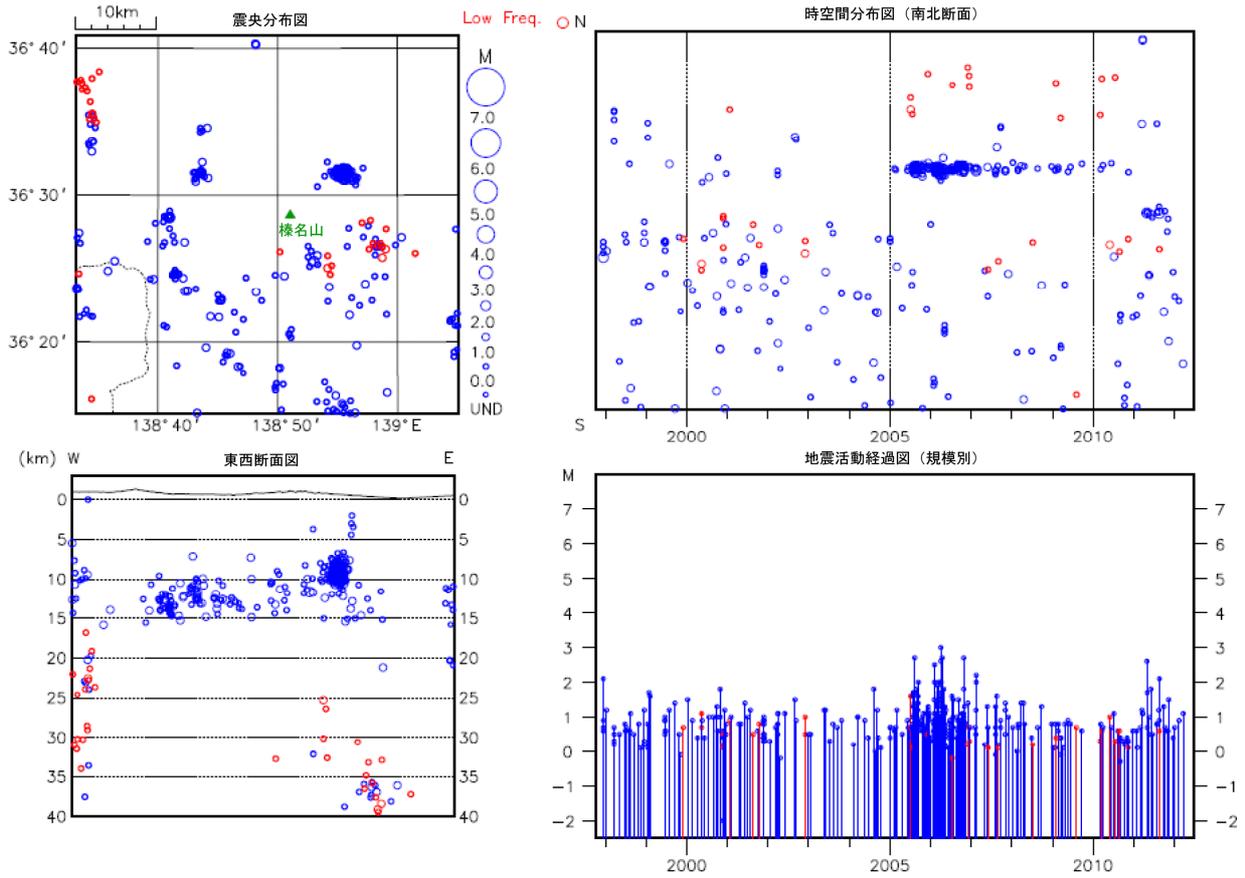


Figure 43-3 Activity of shallow VT earthquakes (blue circles) and deep low-frequency earthquakes (red circles) observed by a regional seismometer network (October 1, 1997, to June 30, 2012). Epicenter distribution (upper left), space-time plot (N-S cross-section) (upper right), E-W cross-section (lower left) and magnitude-time diagram (by scale) (lower right).

## Information on Disaster Prevention

### ① Hazard Map

None

## Social Circumstances

### ① Populations

- Takasaki City: 375,807 (as of October 31, 2011)
- Higashi-Agatsuma Town: 16,209 (as of October 1, 2011)
- Shibukawa City: 83,914 (as of October 31, 2011)
- Shinto Village: 7,511 (as of August 31, 2011)
- Yoshioka Town: 19,603 (as of November 1, 2011)

### ② National Parks, Quasi-National Parks, Number of Climbers

- No national or quasi-national parks

### ③ Facilities

#### Takasaki City

- Haruna Visitor Center
- Harunasan Ropeway

# Monitoring Network

## Wide Area

\* Monitoring sites with multiple observation instruments are indicated by small black dots, and other symbols indicate types of monitoring.



1:200,000 scale regional maps (Takada, Nikko, Utsunomiya and Nagano) published by the Geospatial Information Authority of Japan were used.

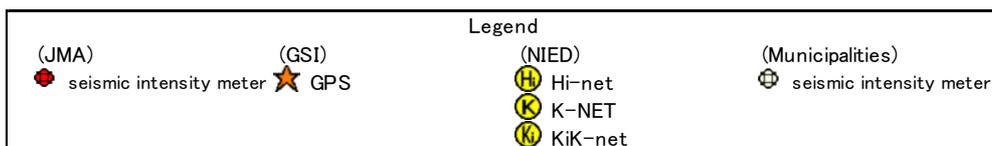


Figure 43-4 Regional monitoring network.

## **Bibliography**

Geshi, N., and Takeuchi, K., (2012) Geological Survey of Japan, AIST (in Japanese with English Abstract).

Oshima O (1986) Geology of Japan 3, Kanto, 222-224 Kyoritsu Shuppan (in Japanese).

Soda, T., (1998) Field Guide of volcanoes of Japan, Volcanoes in Kanto and Koshinetsu area I, Tsukiji Shoten. 74-92 (in Japanese).

(Geshi, N.)