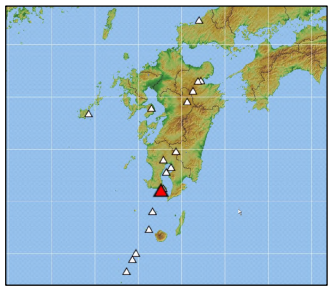
92. Kaimondake

Latitude: 31°10'48" N, Longitude: 130°31'42" E, Elevation: 924 m
(Kaimondake) (GSI Measuring Point)



Overview of Kaimondake taken from southeast on December 6, 2007 by the Japan Meteorological Agency

Summary

An andesite lava dome is located at the summit of this basalt stratovolcano. From a distance, the two look connected, appearing to be a simple stratovolcano, hence it also being known as "Satsuma Fuji". It became active approximately 4,400 years ago (Okuno, 2002), and the last lava dome formation was in the 9th century (AD 885). The SiO_2 content of basalt - andesite is between 50.6 and 56.5 wt % .

Red Relief Image Map

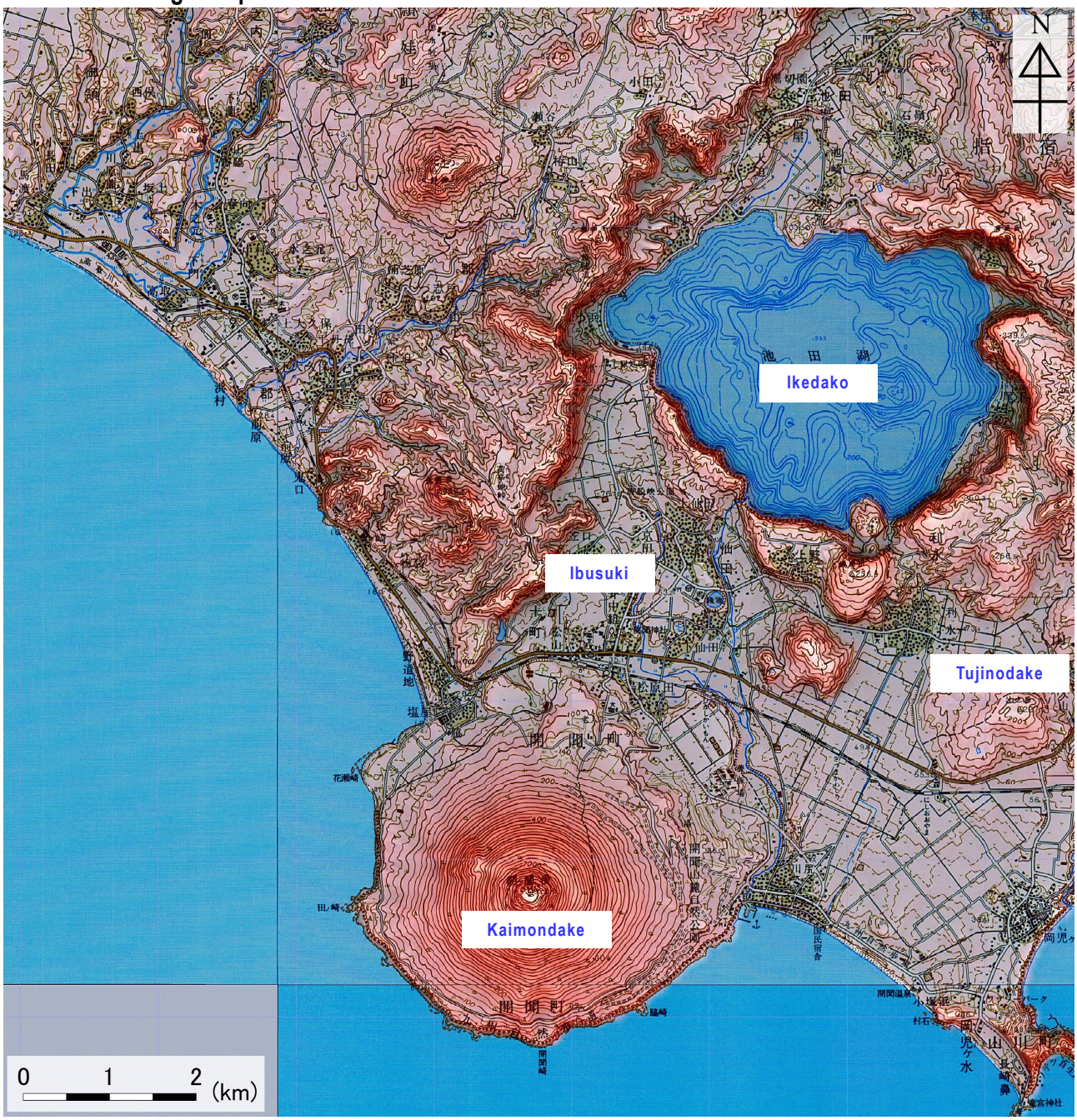


Figure 92-1 Topography of Kaimondake.

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

Submarine Topographic Map

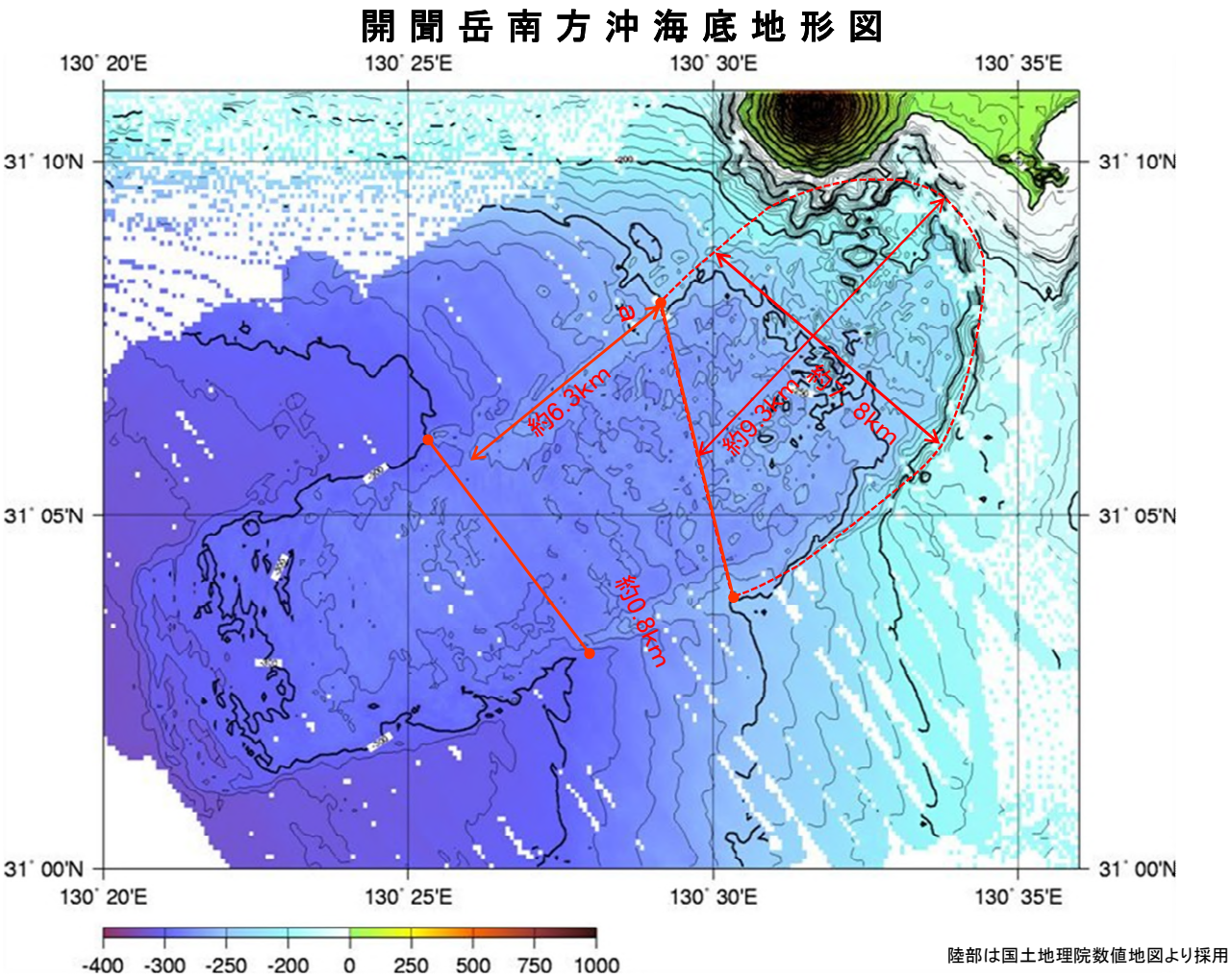


Figure 92-2 Submarine topographic map of the Kaimondake area (Japan Coast Guard).

On the sea floor to the south of Kaimondake is a steep cliff known as the Kaimon Submarine Escarpment, and many small rolls (hummocky topography). The edge and tip cliffs are clearly delineated, forming a tongue-shaped plateau.

Research of geological structures shows that this Kaimon Submarine Escarpment can be seen underground to the south of the Kaimondake volcanic edifice as well, so a landslide is considered to have occurred before the present Kaimondake was formed. (Japan Coast Guard, 2008).

Chronology of Eruptions

・Volcanic Activity in the Past 10,000 Years

Eruptive activity began at Kaimondake approximately 4,400 years ago (Okuno, 2002). Initial activity consisted of a phreatomagmatic eruption in a shallow sea area. Eruptions occurred repeatedly, emitting lava, and it is postulated that approximately 2,500 years ago a volcanic edifice roughly the same size as the present one had been formed. Significant amounts of volcanic material were discharged in the volcanic activity approximately 1,500 and 2,000 years ago, greatly contributing to the formation of the stratovolcano. After this, during the historical era, the eruptions in 874 and 885 greatly changed the topography of the summit area, and towards the end of the eruptions, a lava dome was formed inside the crater (Fujino and Kobayashi, 1997). On the sea floor, to the south of Kaimondake exist debris avalanche deposits which are considered to have come from the Kaimondake area. The edge and tip cliffs, and hummocky topography, are clearly visible, but the remains of the collapse of the debris source are completely buried by the stratovolcano.

Period	Area of Activity	Eruption Type	Main Phenomena / Volume of Magma
4.5ka		Phreatomagmatic eruption	Tephra fall. Magma eruption volume = 0.27 km^3 DRE. (VEI 4)
4ka		Magmatic eruption	Tephra fall. Magma eruption volume = 0.002 km^3 DRE. (VEI 2)
3.8ka		?	Tephra fall. (VEI 2)
3.5←→3.3ka	Details unknown, but at least partially an eruption at the foot of the volcano	Magmatic eruption	Tephra fall. Magma eruption volume = 0.128 km^3 DRE. (VEI 4)
3.1ka		Phreatomagmatic eruption	Tephra fall. Magma eruption volume = 0.004 km^3 DRE. (VEI 2)
2.6ka	Near Kaimondake summit	Phreatomagmatic eruption, magmatic eruption	Tephra fall, lava flow. Magma eruption volume = 0.039 km^3 DRE. (VEI 3)
2.4ka	Near Kaimondake summit	Magmatic eruption, phreatomagmatic eruption	Tephra fall, lava flow. Magma eruption volume = 0.105 km^3 DRE. (VEI 4)
2.4ka	Near Kaimondake summit	Magmatic eruption, phreatomagmatic eruption	Tephra fall. Magma eruption volume = 0.007 km^3 DRE. (VEI 3)
2.1ka	Near Kaimondake summit	Magmatic eruption	Tephra fall. Magma eruption volume = 0.058 km^3 DRE. (VEI 4)
2.1ka	Near Kaimondake summit	Magmatic eruption	Tephra fall. Magma eruption volume = 0.058 km^3 DRE. (VEI 4)
2ka	Near Kaimondake summit	Magmatic eruption	Tephra fall. Magma eruption volume = 0.096 km^3 DRE. (VEI 4)
2ka	Near Kaimondake summit	Magmatic eruption	Tephra fall. Magma eruption volume = 0.078 km^3 DRE. (VEI 4)
2ka	Near Kaimondake summit	Magmatic eruption	Tephra fall. Magma eruption volume = 0.194 km^3 DRE. (VEI 4)
1.8ka	Near Kaimondake summit	Magmatic eruption, phreatomagmatic eruption	Tephra fall, lava flow. Magma eruption volume = 0.02 km^3 DRE. (VEI 3)
1.6←→1.43	Near Kaimondake summit	Magmatic eruption	Tephra fall, lava flow. Magma eruption volume = 0.217 km^3 DRE. (VEI 3)
1.6←→1.43	Near Kaimondake summit	Magmatic eruption	Tephra fall, lava flow. Magma eruption volume = 0.027 km^3 DRE. (VEI 3)

1.6←→1.43	Kaimondake summit, Yokose pyroclastic cone	Magmatic eruption, phreatomagmatic eruption	Tephra fall, lava flow, pyroclastic surge? Magma eruption volume = 0.043 km^3 DRE. (VEI 3)

* Reference documents have been appended with reference to the catalog of eruptive events during the last 10,000 years in Japan, database of Japanese active volcanoes, and AIST (Kudo and Hoshizumi, 2006) for eruptive period, area of activity and eruption type. All years are noted in calendar years. "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

Year	Phenomenon	Activity Sequence, Damages, etc.
874 (Jogan 16)	Large: Magmatic eruption (producing lahar)	March 25. Tephra fall, pyroclastic flow, lahar. Explosion sound and air-fall ash and sand. The eruption occurred at the Kaimondake summit. Magma eruption volume = 0.109 km^3 DRE. (VEI 4)
885 (Ninna 1)	Large: Magmatic eruption, phreatomagmatic eruption, phreatic eruption	Ninna eruption: August 25 and September 23 to September 24. Tephra fall, pyroclastic flow, lava flow, lava dome. Air-fall gravel. The eruptions occurred at the Kaimondake summit and western flank. Magma eruption volume = 0.136 km^3 DRE. (VEI 4)
1967 (Showa 42)	Earthquake	From August 5 to August 8 earthquake swarms of felt earthquakes occurred in the Ibusuki area.
2000 (Heisei 12)	Fume	From December 12 to late December two fumaroles were confirmed from caverns on the east of the summit, and two fumaroles from caverns on the west of the summit. On December 13 the fumes were pale white, odorless, reached a height of 3 m at most, and had a temperature of 14 °C. On December 21 the fumes were white, odorless, rose 2 to 3 m, had a temperature of 12 °C, contained no detectable amounts of SO_2 or H_2S, and had 0.03 % CO_2 content. They are not believed to be connected to the increased volcanic activity.

* Reference documents have been appended with reference to the catalog of eruptive events during the last 10,000 years in Japan, database of Japanese active volcanoes, and AIST (Kudo and Hoshizumi, 2006) for eruptive period, area of activity and eruption type.

Recent Volcanic Activity

* See Ikeda and Yamagawa

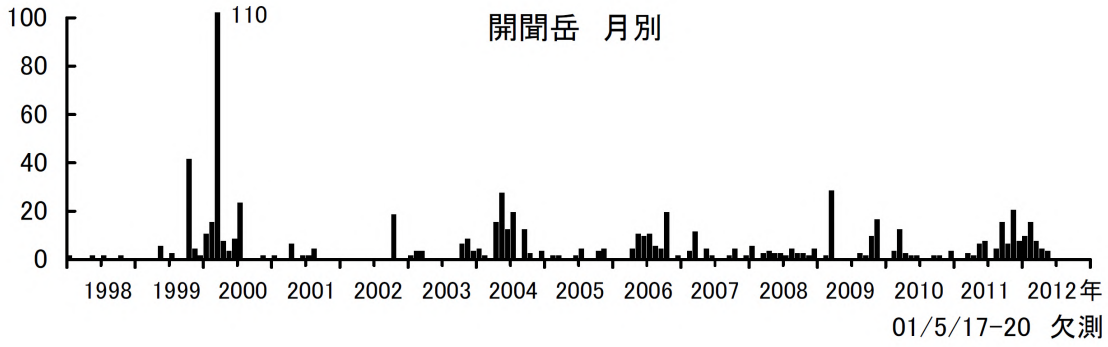


Figure 92-3 Seismic activity by month (1997 to June 10, 2012) (Kyoto University, 2012).

Recent Volcanic Activity

* See Ikeda and Yamagawa

Information on Disaster Prevention

①Hazard Map

None

Social Circumstances

①Populations

- Minamikyushu City: (39,565: as of October 31, 2011, according to Minamikyushu City website)
- Ibusuki City: (44,030: as of November 1, 2011, according to Ibusuki City website)

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

- National Parks, Quasi-National Parks: Kirishima-Kinkowan National Park (special area, regular area)
- Number of mountain-climbers and sight-seers - Kaimondake mountain-climbers: 21,667 (2010 Ibusuki City)

③Facilities

None

Monitoring Network

See Ikeda and Yamagawa

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