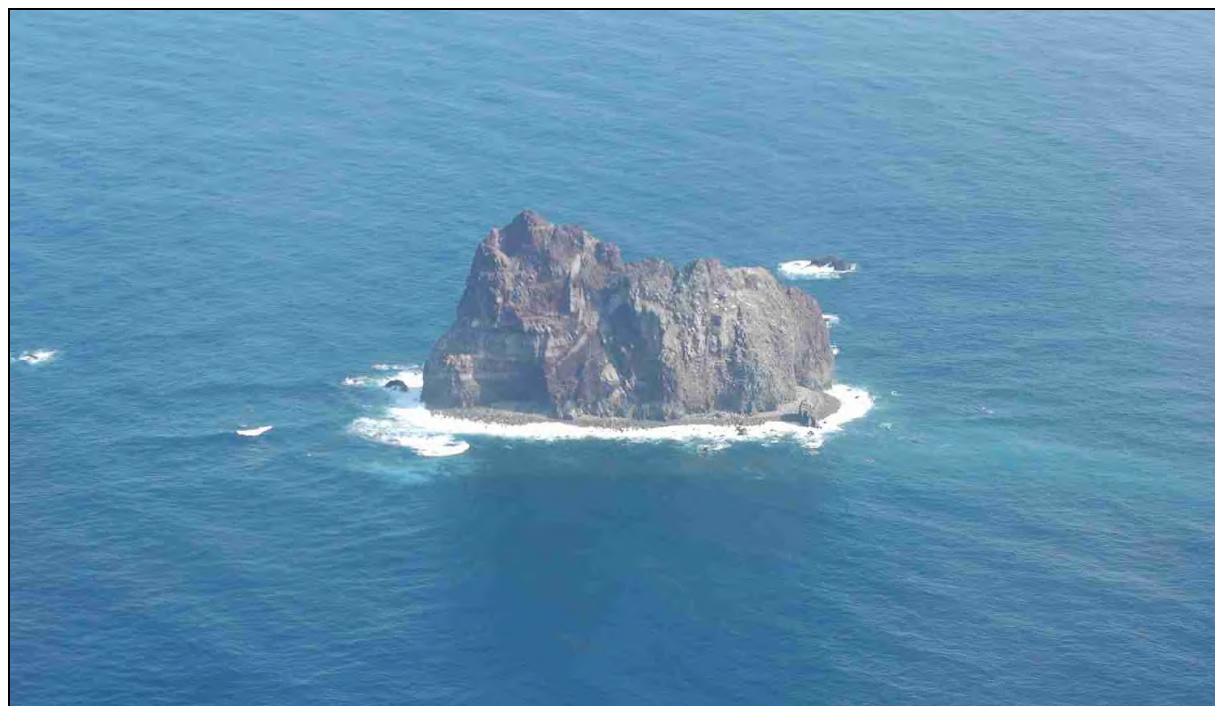
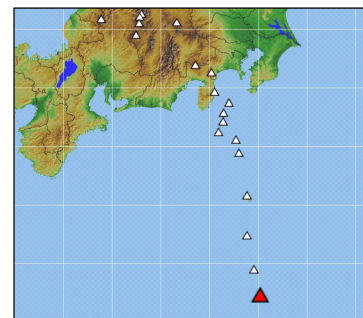


## 67. Sumisujima (Smith Rocks)

Latitude: 31°26'23" N, Longitude: 140°03'02" E, Elevation: 136 m  
(Elevation Point - Measured by JMA)



Overview of Sumisujima taken at the sea from west side on November 22, 2009. Courtesy of the Japan Coast Guard.

### Summary

Sumisujima is a 136 m high isolated reef, extending north-south, located approximately 110 km south of Aogashima. A caldera with a diameter of 10 km is located on the north side of the island. Its long axis runs northwest to southeast (969 m deep at its deepest), with a steep slope with a maximum inclination of 35 degrees. It has a small central cone with a relative height of approximately 200 m, with its summit at a depth of 795 m. The Shirane reef (7.7 m deep) (composed of glassy two pyroxene andesite), located on the east side of the caldera, 7 km north-northeast of Sumisujima, is a conical volcano with a base diameter of approximately 2.5 km. It is one of the post-caldera volcanoes. Sumisujima (olivine basalt) is located on the south side of the caldera, and is the summit of a rise approximately 5 km long and 2 km wide, extending north-south from the caldera. Formation of the caldera occurred roughly 20,000 years ago or earlier because of development of continental shelf around the caldera. The SiO<sub>2</sub> content of ejecta is between 49.4 and 71.9 wt %.

### Submarine Topographic Map

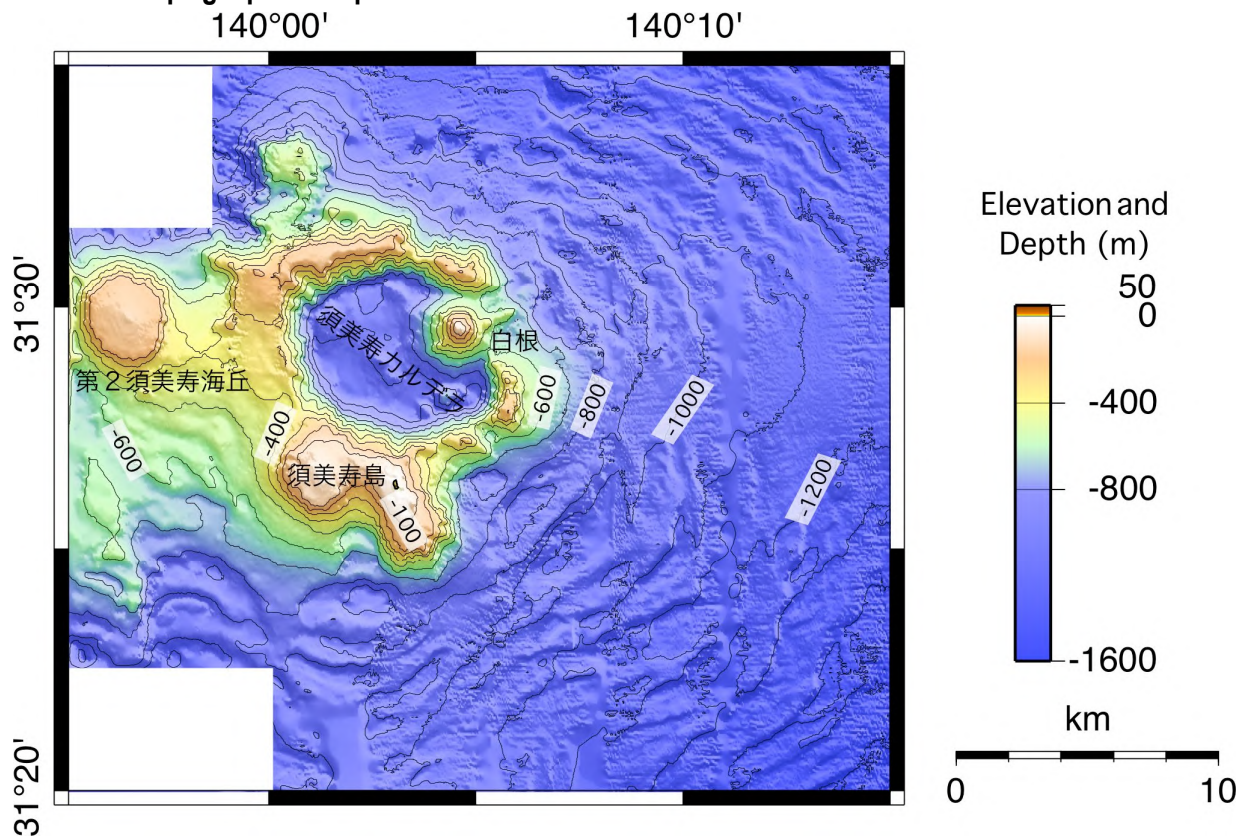


Figure 67-1 Submarine topographic map of the Sumisujima area (Japan Coast Guard).

### Geological Map

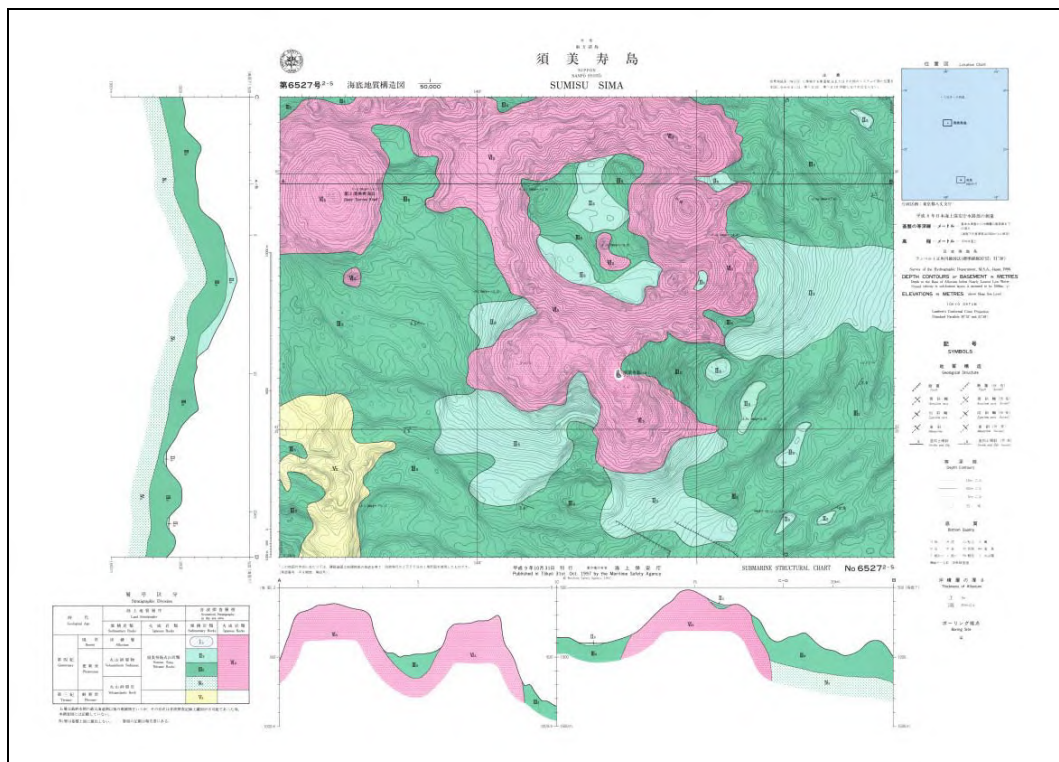


Figure 67-2 Submarine tectonic diagram of the Sumisujima area (Maritime Safety Agency, 1997).

## Chronology of Eruptions

### ▪ Historical Activity

Year	Phenomenon	Activity Sequence, Damages, etc.
1870 (Meiji 3)	Magmatic eruption or phreatomagmatic eruption?	Submarine eruption: Eruption approximately 5 nautical miles north-northeast of Sumisujima (Shirane). Small island appeared (approximately 13 m high and 33 m wide at its widest point).
1916 (Taisho 15)	Eruption?	June 21. Tephra fall The eruption occurred on the sea floor, on the west edge of Sumisujima. An explosion occurred, and a black volcanic plume was emitted from the sea floor on the west edge of Sumisujima. Volcanic ash and sand fell in the nearby area.
1974 (Showa 49)	(Discolored water)	July 6. Discolored water and sulfur smell. The activity occurred in the north of Sumisujima.
1975 (Showa 50)	(Discolored water)	August 13 and September 26. The activity occurred near the coast of Sumisujima.
1976 (Showa 51)	(Discolored water)	August.
1977 (Showa 52)	(Discolored water)	October.
1989 (Heisei 1)	(Discolored water)	January 18 and July 18. The activity occurred near the coast of Sumisujima.
1991 (Heisei 3)	(Discolored water)	November 5. The activity occurred in the Sumisujima area.
1992 (Heisei 4)	(Discolored water)	August 5 and 6. The activity occurred in the Sumisujima area. The water around the island appeared yellow.
1992 (Heisei 4)	(Discolored water)	October 7. The activity occurred at Shirane. Sea water yellowing and sulfur smells were reported Shirane.
1993 (Heisei 5)	(Discolored water)	September 8, 9, and 10. The activity occurred in the Sumisujima area.
1994 (Heisei 6)	(Discolored water)	January 17. The activity occurred in the north and east of Sumisujima. Slight discolored water was observed to the east and north of Sumisujima.
1994 (Heisei 6)	(Discolored water)	July 27. The activity occurred in the north, northeast, southeast, and south of Sumisujima. Alight yellow discolored water was observed to the north of the island, and strong yellow/brown discolored water to the northeast, southeast, and south.
1995 (Heisei 7)	(Discolored water)	July 5, July 6, and July 7. The activity occurred in the north of Sumisujima. Very slight yellow-green discolored water was observed to the north of the island.
1996 (Heisei 8)	(Discolored water)	January 22. The activity occurred in the north of Sumisujima. Slightly deep white discolored water was observed over an area of approximately 500 m to the south.
1997 (Heisei 9)	(Discolored water)	November 21. The activity occurred in the north of Sumisujima. Green discolored water was observed to the north of the island.
1998 (Heisei 10)	(Discolored water)	October 27 and 28. The activity occurred on the west, north, and south coasts of Sumisujima. On October 27, white discolored water was observed on the north and south coasts of Sumisujima. On October 28, white discolored water extended in an arc from the tip of the west coast to the south coast.
1999 (Heisei 11)	(Discolored water)	January 12, 13. The activity occurred on the south coast of Sumisujima. Slight white discolored water was observed over an area of approximately 300 m from the south coast of Sumisujima to the southeast.
2000 (Heisei 12)	(Discolored water)	October 30. The activity occurred in the Sumisujima area. An area of slightly bluish-white discolored water, approximately 300 m, wide and 1,000 m long, was confirmed extending to the east from the island.
2001 to 2002 (Heisei 13 to 14)	(Discolored water)	October 31 and February 28. The activity occurred on the northwest and east coasts of Sumisujima.
2002 (Heisei 14)	(Discolored water)	September 4. The activity occurred on the northwest coast of Sumisujima.
2003 (Heisei 15)	(Discolored water)	November 6. The activity occurred on the west coastline of Sumisujima.
2005 (Heisei 17)	(Discolored water)	March 8. The activity occurred at the southern tip of Sumisujima.

\* Volcanic periods, areas of activity, and eruption types taken from the Active Volcano Database of Japan, AIST (KUDou and Hoshizumi, 2006 onwards) and the Database of the Maritime and Submarine Volcanoes in Japan (Japan Coast Guard, 2006).

## Bibliography

Maritime Safety Agency (1997): Basic Map of the Sea in Coastal Waters, 6527<sup>2-S</sup>, Maritime Safety Agency (in Japanese with English Abstract).

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