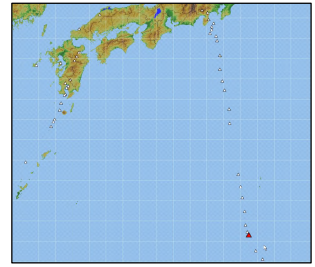
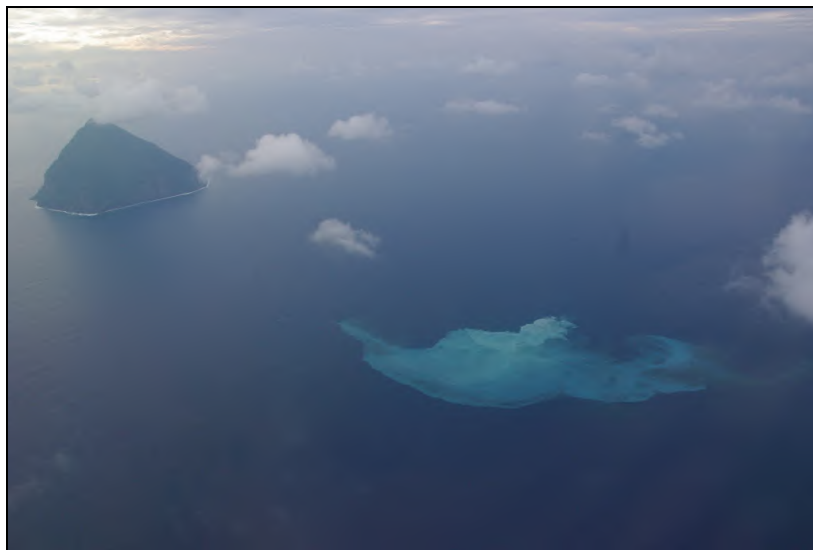


76. Fukutoku-Oka-no-Ba

Latitude: 24°17'05" N, Longitude: 141°28'52" E, Depth: -29 m
(Center of Summit)



Fukutoku-Oka-no-Ba Eruption on January 21, 1986 - Courtesy of the Maritime Safety Agency



Discolored water taken from northeast side on January 19, 2011 - Courtesy of the Japan Coast Guard

Summary

Fukutoku-Oka-no-Ba is a submarine volcano located approximately 5 km northeast of Minami-Ioto. It appeared on and disappeared from the sea surface, called "Shin-Ioto" from 1904 to 1905 and in 1914. A new island 600 m long and 15 m high was formed by the eruption in 1986, but after that, erosion by sea eradicated the island. The rocks (pumice) ejected by the 3 eruptions were all trachy andesite. The ejecta was composed of 48.3 to 52.6 % SiO₂ content by weight. Fishermen call this area "Fukutoku-Oka-no-Ba", and frequent sea discolored water has been observed in and around the area.

Submarine Topographic Map

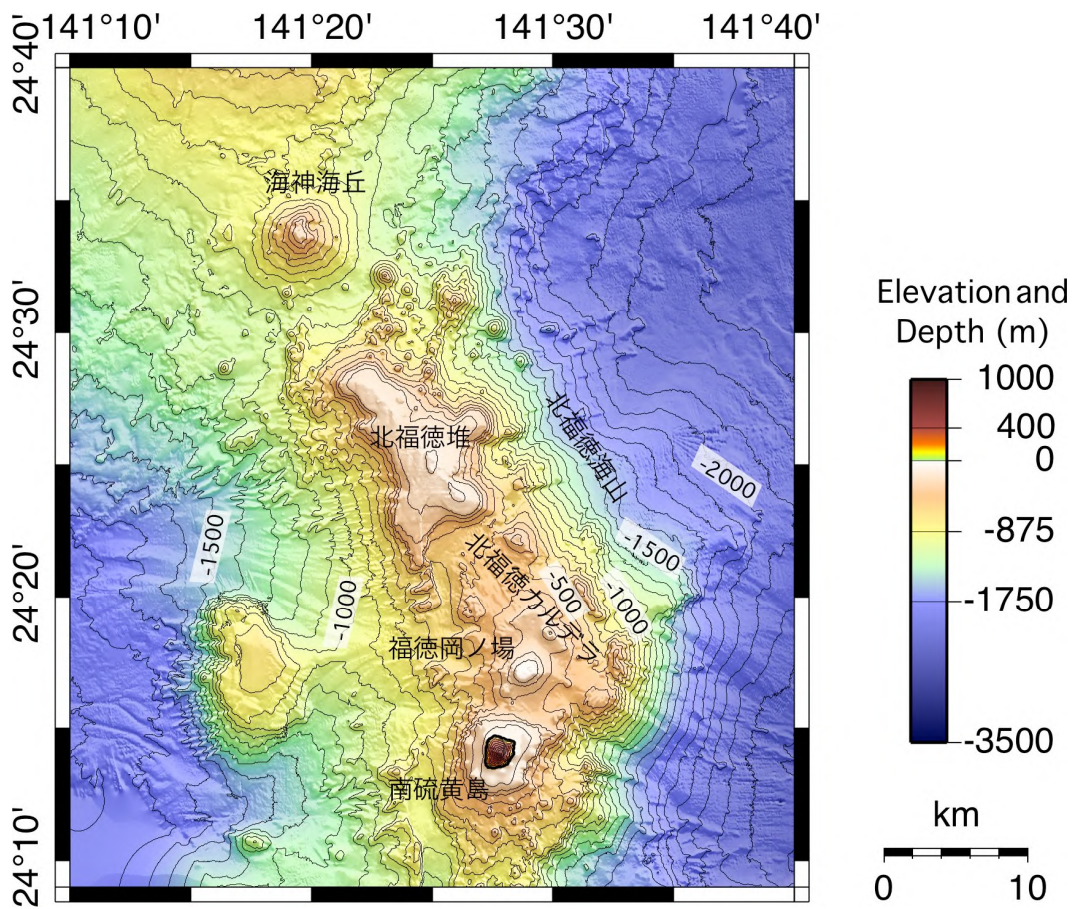


Figure 76-1 Submarine topographic map of the Fukutoku-Oka-no-Ba area (Japan Coast Guard).

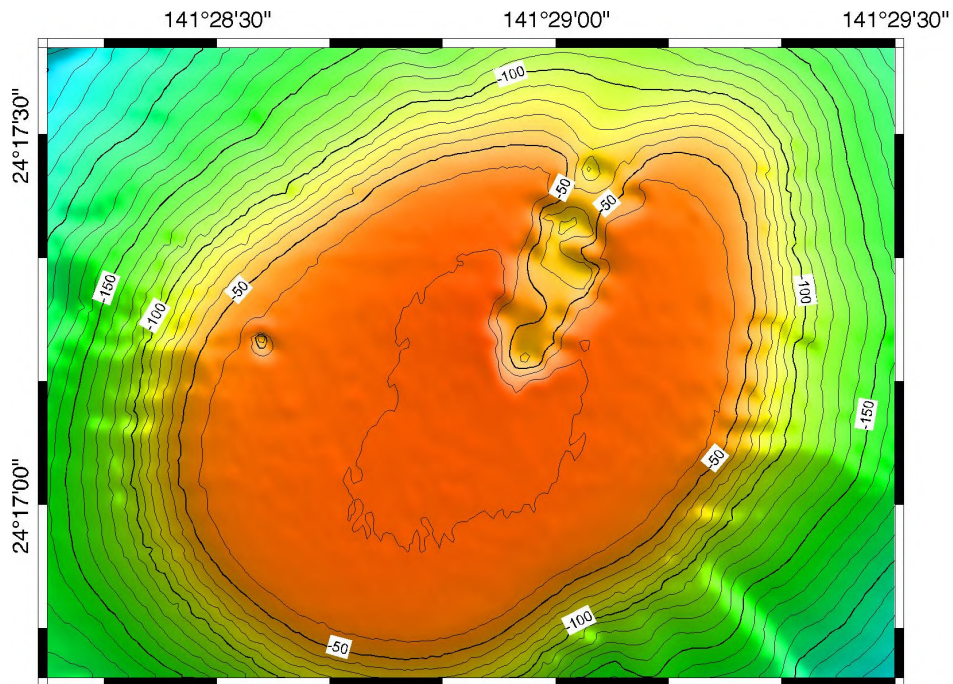


Figure 76-2 Submarine topographic map of the Fukutoku-Oka-no-Ba area (after the 2011 eruption) (Japan Coast Guard).

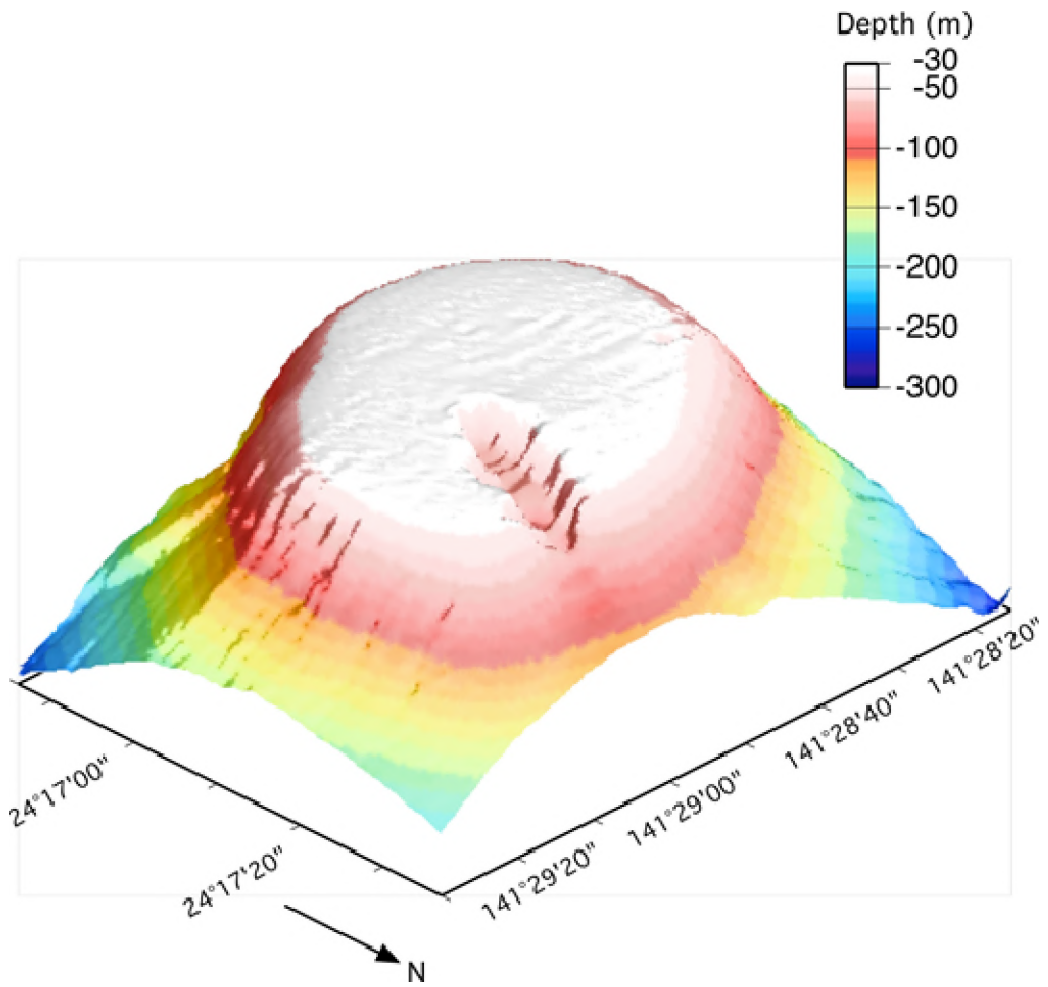


Figure 76-3 Submarine topographic map of the Fukutoku-Oka-no-Ba area (3D) (after the 2011 eruption) (Japan Coast Guard).

Chronology of Eruptions

▪ Historical Activity

* See tables 76-1 and 76-2 for discolored water details.

Year	Phenomenon	Activity Sequence, Damages, etc.
1904 to 1905 (Showa 37 to 38)	Phreatomagmatic eruption or magmatic eruption	January 14, 1904, to late January, 1905. Tephra fall, (floating pumice). The eruptive activity occurred at Fukutoku-Oka-no-Ba (Shin-Ioto). On November 14 an explosion sound occurred. On November 28 a fume appeared. On December 5 the formation of a new island was discovered. The roughly circular new island was later measured to be 145 m high and approximately 4.5 km in circumference. By June 15, 1905, the new island had shrink to 2.5 to 3 m in height, eventually turning into a reef rock.
1914 (Taisho 3)	Magmatic eruption, phreatomagmatic eruption	January 13 to February 12. Tephra fall, (floating pumice). The eruptive activity occurred at Fukutoku-Oka-no-Ba (Shin-Ioto). On January 23 a large volcanic plume appeared, as well as lava. On January 25 a new island appeared (300 m high, 11.8 km in circumference). In December the new island began breaking apart at multiple locations, and by 1916, it disappeared.
1973 to 1974 (Showa 48 to 49)	Eruption, discolored water	December 18 to 19, 1973, and January 1 and February 16, 1974. The eruptive activity occurred at Fukutoku-Oka-no-Ba. A sulfur-like substance was discharged.
1986 (Showa 61)	Phreatomagmatic eruption, (discolored water)	Activity observed from January to December. Tephra fall, (floating pumice). The eruptive activity occurred at Fukutoku-Oka-no-Ba. A prominent eruption which could be seen above the sea surface occurred from January 18 to 21, 1986, forming a new island, which disappeared by March 26, 1986.
1992 to 1993 (Heisei 4 to 5)	?→(sea water discoloration) → magmatic eruption or phreatomagmatic eruption → (discolored water)	June, August, September, November, and December, 1992. The eruptive activity occurred at Fukutoku-Oka-no-Ba. On June 6, 1992, a water column was observed. Discolored water occurred in August and September. On November 10, 1992, an eruption occurred, and floating pumice and sea discolored water were observed. Discolored water was observed in November and December. Discolored water was observed in February, March, June, and September, 1992.
2005 to 2007 (Heisei 17 to 19)	Small-scale: (discolored water) → magmatic eruption or phreatomagmatic eruption → (Discolored water)	(Floating pumice). The eruptive activity occurred at Fukutoku-Oka-no-Ba. From July 2 to 3, 2005 a small submarine eruption occurred. Floating objects and discolored water. Magma eruption volume = 0.0003 km ³ DRE. (VEI 1)
2010 (Heisei 22)	Eruption	A small submarine eruption occurred on February 3 (the first since July, 2005). Floating objects and sea water discoloration. Discolored water was observed in January, February, March, April, May, June, July, September, and December. The eruptive activity occurred at Fukutoku-Oka-no-Ba.

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

Recent Volcanic Activity

Table 76-1 Volcanic activity at Fukutoku-Oka-no-Ba over past 30 years (1950 to June, 2012)

Month	1	2	3	4	5	6	7	8	9	10	11	12
Year												
1950		○										
1951												
1952						○						
1953												○
1954												
1955				○								
1956				○	○							
1957												
1958							○	○	○	○		
1959							○	○	○	○		
1960							○	○	○			
1961												
1962							○		○	○		
1963										●		
1964												
1965												
1966												
1967							○					
1968		○						○				
1969												
1970												
1971												
1972										○		
1973												○
1974	○	●										●
1975	○	○		○		○					○	
1976								○				○
1977	○	○	○	○	○	○	○	—	○	○	○	○
1978	○	○	○	○	○	○		○		—	○	○
1979	○	○	○	○		—	—○	—	○	○	○	○

● : Volcanic plume, ○ :discolored water-: No discolored water

Items with no symbols indicate no observations were performed.

Table 76-2 Volcanic activity at Fukutoku-Oka-no-Ba over past 30 years (1982 to June, 2012) (continued)

Month	1	2	3	4	5	6	7	8	9	10	11	12
Year												
1980		○	○	○	○	○	○	—	—	—	○	○
1981	○	○	○	○		—	○	○	○	—	—	○
1982	○	○	○	○	○	○	○	○	○	○	○	○
1983	○	○	○		○	○	○	—	—	○	○	○
1984	○	○	○	○	○	○	○	○	○	—	○	—
1985		○	○	○	○	○	○	○	○	○	○	○
1986	●	○	○	○	○	○	○	○	○	○	○	○
1987	○	○	○	○	○	○	○	○	○	○	○	○
1988	○	○	○	○	○	○	○	○	○	○		○
1989	○	○	○	○	○	○	○	○	○	○	○	—
1990	○	○	○	○	○	—	—	—	○	—	○	—
1991	—	○	—	—	—	—	○	—	○	○	—	—
1992	—	—	—	—	—	—	—	○	○	—	●	○
1993	—	○	○	—	—	○	—	—	○		—	—
1994	—	—	—	—	—			—	—	—	—	—
1995		—	—	—	—	—	—	—	—	—	○	○
1996	○	—	○	○	○	—	—	—	○	○	—	○
1997	○	○	○	○	○	—	○		—	○	○	○
1998	○	○	—	—	○	—	—	—	—	○	—	○
1999	○	—	—	—	—			—	○	—	○	
2000	○	○		○	—		○	—	—	○	—	○
2001	—	○	○	—	—	○	—		—	○		○
2002	—	○	○	—	—		—	—	—		—	○
2003		—	○	—	—	—	—	—	—	—	○	○
2004	○	○	○	○	—	○	—	○	○	○	○	—
2005	○	○	○	—	○		●	—	○	○	○	○
2006	○	○	○	○	○	○	○	○	○	○	○	○
2007	○	○	○	○	○	○	○		○	○	○	○
2008	○	○	○	○		○	○		—		○	○
2009	○	○	○	○	○	○	○	○	○	○	○	○
2010	○	●	○	○	○	○	○	○	○	○	○	○
2011	○	○		○	—		—				—	
2012	○		○	○	○	○						

● : Volcanic plume, ○ : discolored water-: No discolored water

Items with no symbols indicate no observations were performed.

Information on Disaster Prevention

- ① Hazard Map
None

Bibliography

- Japan Coast Guard (2003): Report of Coordinating Committee for Prediction of Volcanic Eruption, **82**, 107-109 (in Japanese).
- Japan Coast Guard (2003): Report of Coordinating Committee for Prediction of Volcanic Eruption, **84**, 81-83 (in Japanese).
- Japan Coast Guard (2003): Report of Coordinating Committee for Prediction of Volcanic Eruption, **85**, 112-113 (in Japanese).
- Japan Coast Guard (2004): Report of Coordinating Committee for Prediction of Volcanic Eruption, **87**, 118-122 (in Japanese).
- Japan Coast Guard (2004): Report of Coordinating Committee for Prediction of Volcanic Eruption, **88**, 135-137 (in Japanese).
- Japan Coast Guard (2005): Report of Coordinating Committee for Prediction of Volcanic Eruption, **89**, 98-102 (in Japanese).
- Japan Coast Guard (2005): Report of Coordinating Committee for Prediction of Volcanic Eruption, **90**, 129-131 (in Japanese).
- Japan Coast Guard (2006): Report of Coordinating Committee for Prediction of Volcanic Eruption, **91**, 58-61 (in Japanese).
- Japan Coast Guard (2006): Report of Coordinating Committee for Prediction of Volcanic Eruption, **92**, 22-25 (in Japanese).
- Japan Coast Guard (2006): Report of Coordinating Committee for Prediction of Volcanic Eruption, **92**, 48-51 (in Japanese).
- Japan Coast Guard (2006): Report of Coordinating Committee for Prediction of Volcanic Eruption, **93**, 98-103 (in Japanese).
- Japan Coast Guard(2006): the Database of the Maritime and Submarine Volcanoes in Japan (<http://www1.kaiho.mlit.go.jp/GIJUTSUKOKUSAI/kaiikiDB/list-2.htm>) (in Japanese).
- Japan Meteorological Agency (2005): National Catalogue of the Active Volcanoes in Japan (3rd editions), 459-462 (in Japanese).
- Kato, U. (1988): Bull. Volcanol. Soc. Jpn, **33**, 21-30 (in Japanese with English abstract).
- Maritime Safety Agency et al. (1986): Report of Coordinating Committee for Prediction of Volcanic Eruption, **37**, 50-69 (in Japanese).
- Maritime Safety Agency (1991): Report of Coordinating Committee for Prediction of Volcanic Eruption, **49**, 83 (in Japanese).
- Maritime Safety Agency (1991): Report of Coordinating Committee for Prediction of Volcanic Eruption, **50**, 88-89 (in Japanese).
- Maritime Safety Agency (1991): Report of Coordinating Committee for Prediction of Volcanic Eruption, **51**, 120-121 (in Japanese).
- Maritime Safety Agency (1992): Report of Coordinating Committee for Prediction of Volcanic Eruption, **52**, 102-103 (in Japanese).
- Maritime Safety Agency (1992): Report of Coordinating Committee for Prediction of Volcanic Eruption, **54**, 77-79 (in Japanese).
- Maritime Safety Agency (1993): Report of Coordinating Committee for Prediction of Volcanic Eruption, **55**, 158-163 (in Japanese).
- Maritime Safety Agency (1993): Report of Coordinating Committee for Prediction of Volcanic Eruption, **57**, 151-153 (in Japanese).
- Maritime Safety Agency (1994): Report of Coordinating Committee for Prediction of Volcanic Eruption, **60**, 136-139 (in Japanese).
- Maritime Safety Agency (1996): Report of Coordinating Committee for Prediction of Volcanic Eruption, **64**, 73-78 (in Japanese).
- Maritime Safety Agency (1997): Report of Coordinating Committee for Prediction of Volcanic Eruption, **65**, 50-54 (in Japanese).
- Maritime Safety Agency (1996): Report of Coordinating Committee for Prediction of Volcanic Eruption, **66**, 119-120 (in Japanese).
- Maritime Safety Agency (1997): Report of Coordinating Committee for Prediction of Volcanic Eruption, **67**, 83-85 (in Japanese).
- Maritime Safety Agency (1997): Report of Coordinating Committee for Prediction of Volcanic Eruption, **68**, 100-103 (in Japanese).

- Maritime Safety Agency (1998): Report of Coordinating Committee for Prediction of Volcanic Eruption, **69**, 113-114 (in Japanese).
- Maritime Safety Agency (1998): Report of Coordinating Committee for Prediction of Volcanic Eruption, **70**, 65-66 (in Japanese).
- Maritime Safety Agency (1998): Report of Coordinating Committee for Prediction of Volcanic Eruption, **71**, 115-117 (in Japanese).
- Maritime Safety Agency (1999): Report of Coordinating Committee for Prediction of Volcanic Eruption, **73**, 108-111 (in Japanese).
- Maritime Safety Agency (2000): Report of Coordinating Committee for Prediction of Volcanic Eruption, **75**, 119-121 (in Japanese).
- Maritime Safety Agency (2001): Report of Coordinating Committee for Prediction of Volcanic Eruption, **76**, 123-126 (in Japanese).
- Maritime Safety Agency (2002): Report of Coordinating Committee for Prediction of Volcanic Eruption, **79**, 162-167 (in Japanese).
- Nakano, S. and Kawanabe, Y. (1992): Bull. Volcanol. Soc. Jpn, **37**, 95-98 (in Japanese with English Abstract).
- Ogura, T. (1907): Report of the Imperial Earthquake Investigation Committee., **79**, 4-15 (in Japanese).
- Ossaka, J. (1986): Bull. Volcanol. Soc. Jpn, **31**, 173-175 (in Japanese).
- Otani, Y., et al. (2006): Report of Hydrographic and Oceanographic Researches., **42** (in Japanese with English Abstract), 31-37.
- Terada, T.(1914) Toyo Gakugei Zasshi, **31**, 149-158 (in Japanese).
- Tsuchide, M. and Sato H. (1986): Journal of the Japan society of photogrammetry and remote sensing, **25**, 12-18 (in Japanese with English Abstract).
- Wakimizu, T. (1907): Report of the Imperial Earthquake Investigation Committee., **56**, 1-24 (in Japanese).
- Wakimizu, T. (1920) Toyo Gakugei Zasshi, **37**, 257-268 (in Japanese).
- Yoshida, T. et al. (1987): Res. Rept. Lab. Nucl. Sci. Tohoku Univ., **20**, 202-215 (in Japanese).

(Ito, K.)