

An Overview of the Recent Submarine and Near-shore Eruptions in Japan

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Japanese volcanoes are distributed along the two subduction zones, i.e. along the Kuril-Japan-IzuOgasawara trenches and the Ryukyu trench. 'Izu Islands' and 'Volcano Islands' which form a more than 1500 km long volcanic chain south of Tokyo are along the Izu-Ogasawara trench including at least 17 subaerial and submarine active volcanoes (or volcanic areas). 'Ryukyu Islands' chain between Kyushu and Taiwan, about 1100 km long, includes at least 6 active ones. In the 20th century, submarine and/or near-shore eruptions occurred at at least 12 volcanoes (or volcanic areas) in the former chain, and at 2 in the latter. Short notes on some outstanding eruptions are given in the following, from the north to the south:

1) Izu-Tobu volcanic group, submarine eruption in 1989. More than 100 subaerial and submarine monogenetic volcanoes are distributed in the eastern part of Izu Peninsula. New submarine volcano named 'Teishi knoll' was formed about 3 km NW off densely populated Ito City. Dacite pumice and juvenile basaltic fragments were ejected to form a crater about 200m cross in the shallow seafloor about 95m deep. Topographic change of the floor just before and after the eruption was observed in detail by JMSA.

2) Myojin-sho (Myojin-Reef), 1952-53. Since 1896 many submarine eruptions have been reported in a wide area (<14km) around Bayonnaise Rocks. In 1952-53, at about 10km ENE of the Rocks, violent submarine eruption formed a reef called Myujin-sho, though it disappeared soon. A research vessel together with 31 persons were lost in the eruption. Recent research revealed the existence of a caldera about 8 km across (Ueda et al., 2001). The Rocks and Myojin-sho are located at the caldera rim, and there is a central cone about 800m high with the top 328m below the sea surface.

3) Nishino-shima, 1973-74. Nishino-shima is a flat-topped small island (about 500m long and 25m high) located at the NW crater rim of a large submarine volcano about 30 km in diameter. In the 1973-74 eruption, a new vent opened at the SW rim, and 5 major vents were formed to the W and NE forming pyroclastic cones with issuing of lava flows. The island became 3 times larger than the old one. The new andesite lava mass resisted against the wave erosion, and the new island survived.

4) Fukutokuoka-no-ba (Shin-Iwo-jima), 1904-05, 14, 86 Since the 1904 eruption, many eruptions and discolored sea water have been observed at the sea about 5 km NE of Minami-Owo-jima. A new cone (island) with heights of 150m and 120m (300m?) was formed in 1904-05 and 1914 eruptions, respectively. However, the eruption

material was loose pyroclastics without solid lava flow. Wave erosion easily removed the island away. In the 1986 eruption, incomplete tuff-ring (600m x 200m) was formed, but easily eroded away within about 2 months. The ejecta were of trachyandesite pumice.

5) Satsuma-Iwo-jima (Shin-Iwo-jima), 1934-35. Satsuma-Iwo-jima, located to the south of Kyushu, is an active volcanic island formed on the rim of Kikai submarine caldera about 23km x 16km. About 2 km to the east of the island, new eruption occurred in 1934-35 to form a lava cone (or dome) within the caldera. Formation and destruction of the cone by the explosion occurred. The small lava cone, made up of glassy dacite, is about 20m high at present.

6) Submarine volcano north of Iri-Omote-jima, 1925. At this volcano located to the east of Taiwan, a submarine eruption was seen, though the details were not well known. Pumice raft 5.6km long and 0.9km was observed on the next day, and pumice lumps were reported at many seashores around Japan.