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# Changes in biota following volcanic eruption on Nishinoshima island among the Ogasawara islands in subtropical Japan

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## Abstract

Nishinoshima is a volcanic island among the Ogasawara Islands of subtropical Japan. In November 2013, a major eruption began on this island; continuing intermittent eruptions covered nearly the entire island with lava flows. These lava flows formed new land, increasing the area of the island from 27 to 295 ha. Before the 2013 eruption, six plant species and eight breeding seabird species were found on the island; however, their habitats were almost completely destroyed by lava flow. To estimate the impact of the eruption, I investigated floral and avifaunal changes using a land survey and aerial photography. In 2016, three plant species and three breeding seabirds were confirmed to have survived the 2013 eruption. By 2018, another three breeding seabirds were found. Plant distribution was limited to on and around a small remnant of the former island, although it recovered to some extent between 2016 and 2018. Seabird responses to the event differed among species, with some seabirds using the newly formed land for breeding. In particular, the breeding range of the brown booby *Sula leucogaster* expanded significantly, regaining its pre-eruption population size. Increases in population sizes among the masked booby (*Sula dactylatra*) and greater crested tern (*Sterna bergii*) are now greater than before the eruption, whereas those of the wedge-tailed shearwater (*Puffinus pacificus*) and brown noddy (*Anous stolidus*) have decreased. Although the eruption had a devastating impact on the biota of the island, some seabirds benefited from the expansion of land area and increased habitat diversity. Future monitoring of the changing biota on the new-formed land would provide empirical knowledge of species assembly on these isolated oceanic islands.

**Keywords:** volcano, eruption, avifauna

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