

Characteristics of growth change of phytoplankton by volcanic ash by use of data of geostationary meteorological satellite Himawari-8

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Iron is an important micronutrient for marine phytoplankton growth. Recent studies suggest that sedimentation of volcanic ash is a way to inject large amounts of bioavailable iron into the surface ocean. Volcanic ash is transported to the atmosphere to a height of tens of kilometers during a large eruption. Additional supply of volcanic substances to the marine environment would affect primary productivity of the ocean. If primary production was reinforced by the addition of nutrients from the volcanic source, an increase in chlorophyll-a concentration is observed after volcanic eruption. Therefore, we aimed to grasp the influence of volcanic eruption on chlorophyll-a concentration using satellite data. The target area is the poor nutrition area located south of the Kuroshio of the Pacific Ocean. We focus on Nishinoshima island where volcanic eruption has been observed in recent years. Nishinoshima is a volcanic island on an uninhabited island of the Ogasawara Islands. The active eruptions in Nishinoshima island have been observed in 2013. With the eruption, an enlargement of the land area of the island was observed. The land area has expanded to about nine times. Volcanic activity subsided in 2016. Eruption activity was observed again from April 20, 2017. Eruptions have not been observed after August 11, 2017. We analyzed the data of the geostationary meteorological satellite Himawari-8. The products of Himawari-8 we used are the concentrations of chlorophyll-a aerosol, photosynthetically available radiation, and sea surface temperature from March 2016 to December 2017. The original time resolution of Himawari-8 is 10 minutes, which is shorter than any other satellite. Therefore, opportunities to analyze the growth of phytoplankton are increasing. Because these parameters are not retrieved under cloudy conditions. The time and spatial resolutions of chlorophyll a concentration, aerosol concentration, photosynthesis available radiation are 1 hour and 5 km, respectively. The resolutions of sea surface temperature are 1 hour and 2 km. We will show the relation of the growth change of phytoplankton due to the influence of the volcanic eruption from Himawari-8 at the poster session.

Keywords: phytoplankton, volcanic eruption, Himawari-8