[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG41]Biogeochemical linkages between the ocean and the atmosphere during phytoplankton blooms

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Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Multi-scale vertical and horizontal ocean mixing processes can strongly influence the distribution of dissolved and suspended substances including macro- and micro-nutrients, and may impact on phytoplankton bloom formation. The changes in nutrient dynamics generally affect the abundance, composition and metabolic activity of marine organisms such as phytoplankton and bacteria during the bloom. Marine phytoplankton can produce volatile organic compounds (VOCs) and marine atmospheric aerosols, which strongly influence on atmospheric chemistry. Primary and secondary organic and inorganic components produced via marine phytoplankton activity can contribute to the Earth's radiative forcing, and in turn marine ecosystems including biogeochemical processes directly or indirectly. Therefore, the biogeochemical cycles have a tight linkage between the ocean and the atmosphere. In order to understand physical, chemical and biological processes relevant to phytoplankton bloom formation in the ocean, dynamics of VOCs and marine aerosols in the atmosphere, and the biogeochemical linkage between the ocean and the atmosphere, we welcome new interdisciplinary presentations and active discussions on physical, chemical, and biological sciences both from ocean and atmospheric fields in this session. Studies linked to the Surface Ocean-Lower Atmosphere Study (SOLAS) project are good examples, but other related studies are also invited.

[ACG41-P01]Characteristics of growth change of phytoplankton by volcanic ash by use of data of geostationary meteorological satellite Himawari-8

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Keywords:phytoplankton, volcanic eruption, Himawari-8

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 special 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.