

Drift of an ocean bottom electromagnetometer from Nishinoshima to Iriomotejima

*Noriko Tada¹, Haruka Nishikawa¹, Hiromi Kayama WATANABE¹, Hiroshi Ichihara^{2,1}, Tatsu Kuwatani¹

1. Japan Agency for Marine-Earth Science and Technology, 2. Nagoya University

Two ocean bottom electromagnetometers (OBEMs) installed on the seafloor around Nishinoshima Island in September 2018 did not float in June 2019, even though the acoustic transducer and weight release unit installed on the OBEMs worked as usual. The OBEMs stayed at the same position on the seafloor although the recovery of the OBEMs were tried for about two days. On the other hands, the positions of OBEMs in June 2019 were changed from their initial positions which were determined at just after the OBEMs were settled. Volcanic activities were not detected during this period. Then, a KM-ROV was used to find the OBEMs during “Kaimei” KM20-11 cruise. However, the OBEMs were not found on the seafloor in December 2020. Between June 2019 and December 2020, Nishinoshima volcano erupted from December 2019 to the middle of August 2020. In February 2021, one of the OBEM settled on the east side of Nishinoshima island was found on a beach on Iriomotejima. It implied a westward drift of the OBEM for 1,700 km. The duration and path way of the drifted OBEM is important to constrain underwater volcanic activities of Nishinoshima. We conducted particle drifting simulations with and without horizontal eddy diffusion to estimate the possible drift path and duration of the recovered OBEM. In addition, we analyze the environmental data recorded in barnacle shells that were attached on the OBEM to compare the results of the drifting simulations. We also compared bathymetric data before and after the OBEM floated from the seafloor. We have already published the preliminary results and suggested that the drift durations were from 180 to 441 days (Tada et al., 2021, EPS). Additional analysis is going to narrow the duration, and we will present new results in this presentation.

Keywords: Nishinoshima, OBEM, drift simulation, barnacle, Iriomotejima