Detailed topography and sub-surface structure around the 2016 Fukushima Earthquake

*Takafumi Kasaya[1], Toshiya Fujiwara[1], Toshiya Kanamatsu[1], Katsunori FUJIKURA[1]

1. Japan Agency for Marine-Earth Science and Technology

The large earthquake of M7.4 was occurred off Fukushima Prefecture on 22 Nov. 2017. This earthquake was not a interpolate earthquake, but normal fault type earthquake occurred in the land-side plate. However, a tsunami with a maximum wave height of 1.4 m was observed around the coastal area of Tohoku distinct. When this earthquake occurred, R/V Shinseimaru and R//V Yokosuka were under the scientific survey mission of other purpose near the focal region of this earthquake. JAMSTEC decided to carry out the immediate survey using both vessels. As the results, some small cliffs were detected. In order to obtain the further information of the succession of cliffs and sea floor condition, including the distribution of benthos, we carried out the visual observation using ROV Hyper-Dolphin (HPD) and detailed survey using the multi narrow echo-sounder and sub-bottom profiler at the KS-17-J04 cruise conducted by the project “Tohoku Ecosystem-Associated Marine Sciences”. We carried out two dives and could detect the flesh topographical cliff of about 1-2 m height difference around the cliff detected by the immediate observation. The uppermost layer under the seafloor is a soft mud layer containing concentrated layer of shells. The lower layer is formed of consolidated sedimentary layer. In near the cliff and the bottom of fissure, some white discoloration zones considered as bacteria mats were observed. At the northernmost fissure where we could arrive, the populations of benthos were observed. Furthermore, we conducted the detailed dense bathymetric survey, sub-surface structure, and the observation using a sidescan sonar with 400 kHz. As these results, we could obtain the distribution of the lineaments and faults around the focal area.

Keywords: 2016 Off Fukushima earthquake, Detailed topography, Fault, Bacteria mat

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