Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

MAG35-P01 Room:Convention Hall Time:May 21 18:15-19:30

Grasping changes in the sea bottom induced by the Tohoku earthquake using radionuclides

Shota Kambayashi[1*], Jing Zhang[2], Akira Takeuchi[2], Keiji Horikawa[2], Hiroyuki Kamachi[2], Hirokami Kiyokazu[3], Harue Masuda[4], Shigeshi Fuchida[4], Masayoshi Yamamoto[5], Masafumi MURAYAMA[6]

[1]Graduate School of Science and Engineer, University of Toyama, [2]Graduate School of Science and Engineer, University of Toyama, [3]Rabolatory of Radioisotope Center for Basic Recearch and Development in Natural Science, [4]Department of Geosciences, Faculty of Science, Osaka City University, [5]Institute of Nature and Environmental Technology , Kanazawa University, [6]Center for Advanced Marine Core Research , Kochi University

Large seafloor faults, fissures and a landslide were confirmed in the sea bottom at the epicenter of the March 2011 Tohoku earthquake. Radionuclides were released into the environment by the associated accident at the Fukushima Daiichi Nuclear Power Plant (FDNPP). These flowed into the ocean and were eventually deposited in the seafloor sediments. By analyzing ^{137}Cs and ^{134}Cs radionuclides in the marine sediments from shore to open sea, we have been able to better assess the radioactivity scattered from FDNPP and understand the changes in the marine sediment induced by the seismic activity of the Tohoku earthquake. Marine sediment samples were obtained from offshore of Fukushima, the Japan Trench and the Shatsky Rise during the R/V *Hakuho-maru* KH-11-7 cruise in 2011. A non-invasive X-ray CT scanner was used to obtain images of the internal structure of the sediment. Further, sediment samples were sliced from the sediment core every 0.5-2.0 cm and the radioactivity of the Gamma ray nuclide was measured using a Ge semiconductor detector. ^{137}Cs and ^{134}Cs in the sediment from offshore Fukushima and the Japan Trench were detected. Through analysis of the ratio of ^{134}Cs/^{137}Cs, it was suggested that most ^{134}Cs was derived from FDNPP. However, the result showed that it had no influence on the environment by FDNPP through detecting the ^{134}Cs in the sediment of open sea. Abundance of ^{137}Cs and ^{134}Cs was different between the most surface layer of the sediment and the whole sample, so it was necessary to analyze the whole sample when evaluating the environment radioactivity in the research area. Focusing on vertical profiles of ^{137}Cs and ^{134}Cs, higher abundance was detected in the surface layer, however high abundance was also detected in the subsurface layer. In addition, it was suggested that the classify of detailed marine sediment changes can be divided into the following three types: I) formation of turbidite by principal earthquake (11 March 2011); II) formation of turbidite by principal earthquake and aftershock; III) formation of turbidite several times by principal earthquake and aftershock.

Keywords: radioactiv cesium, assess the radioactivity, marine sediment change