MIS33-P02 Room:Convention Hall Time:May 26 18:15-19:30

Seabed topography and subbottom images from 200 m to 3,000 m in water depth, off Miyagi and Iwate prefectures

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The 2011 Tohoku earthquake of Mw 9.1 occurred on March 11, 2011 at ˜24 km in depth and ˜130 km southeast from Ojika Peninsula. We have detected the recent dislocation and crustal movement due to the Tohoku earthquake using seafloor topography investigation, earthquake exploration and ocean GPS system and so on (e.g., Sato et al., 2011). The dislocation and movements should be recorded into sediment layers. We need to disclose recent tectonic activities in this area, but there are only a few study examples being geologic structural studies in the sediment layers (e.g., Nitta et al., 2013; AGU abstract).

We analyzed in detail recent deformation structures around Tohoku area using mainly a subbottom profiler (following SBP) system. The ?SBP provided sediment structures within ˜100 m below seafloor around off Miyagi and off Iwate. The water depths were from 200 m to 3,000 m. Total SBP survey lines in this study was 101 lines. For the analyses, we also used multi-narrow-beam (MBES) data to describe deformational seabed topography and single channel seismic data to describe large-scale deformational structures within ˜1000 m below seafloor.

As a result, we disclosed below three points.

?1) From the MBES data, the many lineaments were observed in the south area from 38:45N. This is regarded as a creep deformation.

2) From the SBP data analysis, we observed deformational structures having the cover layers of various thickness. The relative active deformational structures having thin cover layers are located mainly in the south area of 38:05N being SE bulge.

?3) From the MCS data, we detected subsidence and uplifted areas. The uplifted areas correspond to the topography. In addition, we observed several faults of 600 m long.

Based on the above-mentioned result, we concluded our study results as follows.

?1) Based on a geographic characteristics using the MBES and SBP data, we divided into three deformational domains (Domain A, B, C).?

2) Domain A is located ˜50 km SE from Ojika Peninsula. It is ˜300 km2. Judging from the cover layer thickness, We assume that Domain A is continuously in active and also in active now.?

3) Domain B is located on the east of Domain A. It is distributed in ˜500 km2. This domain is similar to Domain A. A fold belt exists between Domain A and B. This implies that Domain A moves faster speed than Domain B.?

4) Domain C is located on the north of Domain B and is distributed in more than ˜900 km2. Judging from the deformational structures and thickness of the cover layers, this area is in active now, but it was stopped at a previous preriod.?

5) According to Arai et al. (2013), there are a long-term subsidence area due to tectonic erosion at the east edge of Domain B. We assume that Domain B moves with the subsidence. Domain A would move to downslope with Domain B movement.