

Characteristics of tsunami origin sediments sampled from Hirota and Toni bay around the Sanriku coast, Japan.

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The recent 2011 Tohoku tsunami strongly affected the coastal area of the Pacific coast of Tohoku. Tokai University and JAMSTEC team investigated the Tohoku coastal area as a part of Tohoku Ecosystem-Associated Marine Sciences (TEAMS). We got the knowledge of distribution of rubble, bottom sediment environment and tsunami information in the local area.

We researched using acoustic equipments (Multi beam echo sounder, Sub bottom profiler and Side scan sonar), bottom sampler and ROV. And, we have interviewed about situation of damage at the local area.

Characteristics of submarine topography

Toni and Okirai bay have the scattered irregularity bottom surface (Okirai 15-20 m and Toni 17-25 m). This irregularity bottom surface relative height is 20-100 cm at Okirai. Rubble was seen in the coast side from this irregularity bottom surface. And, from SBP data, a record to scraping underlying layer was seen. We were able to estimate that submarine topographic signature (erosion surface) made by undertow at Tsunami event.

Surface sediments

SBP data was seen signature reflecting (20-50cm down from seabed), and able to estimate the reflecting surface to depth of approximately 40 m at Hirota bay. In the Toni and Okirai bay, SBP data was seen signature reflecting (20-100cm down from seabed), and able to estimate the reflecting to depth of approximately 50 m. These reflecting characters have large lateral change in each bay.

Columnar core

Almost each core, first layer (approximately 0-10 cm) of core was seen grading structure (middle to coarse) of sand sediment, but second layer (from 10 cm underlying layer) was different facies from center area to side area of each bay. Especially at the center area of axial, bottom part of second layer (contain woodchip and shell piece) was scraping underlying layer. Thus, we were able to estimate upper zone from second layer was tsunami origin sediment.

The longest 2 m core at Hirota bay was divided into two more parts under the second layer, such as, 3rd layer with fine sand to massive silt sediment zone, and 4th layer (140-200 cm) with middle to coarse sand sediment zone. So, we think that underlying layer sediment (from 130 cm underlying layer) has possibility of palaeo tsunami origin sediment.

Keywords: Tsunami origin sediment, Sanriku coast