Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

MIS23-P05 Room:Poster Time:May 2 16:15-17:30

Characteristic of tsunami origin submarine topography -Case study of Toni Bay and Okirai Bay

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The recent 2011 Tohoku tsunami strongly affected the coastal area of the Pacfic coast of Tohoku. Toni Bay located south of Kamaishi city and open toward east. Also Okirai bay open toward east. Tokai University started survey there to confirm effect of Tsunami in 2012

Survey of first year, we make extensively submarine topography. As a result, anomaly topography was observed at Toni Bay (depth of 20-25m) and Okirai (depth of 15-20m). Transparent layer with poor internal reflection was observed as the surface layer within the anomaly topography by Sub Bottom Profiler (SBP). Characteristic of columnar core have grading structure (fine to coarse) of sand sediment and erosion structure between sand sediment and clay sediment. It was guessed that erosion structure was made by turbidity current by tsunami activity. For the above reason, estimated anomaly topography is Tsunami origin topography. So we survey around anomaly topography area more closely in 2013. Describe below the character of Toni Bay and Okirai Bay.

[Toni Bay]

In this research area, submarine topography can be divided into three: 1)gentle slope (0.9 degrees) at depth of 15-22m, 2)planation surface at depth of 22-24m, 3)gentle slope at depth of 24m or more. On the 1)-3), these are a lot of protuberance has distributed. Around the protuberance, current marks like a fan or delta shape extend to toward offshore. And groove mark also observed. And we assume this tsunami origin submarine topography have control by protuberance in this way.

[Okirai Bay]

In this research area, topography can be divided into three: 1)gentle slope (1 degrees) at depth of 8.5-17.5m, 2)planation surface at depth of 17.5-19m, 3)gentle slope at depth of 19.5m or more. On the 1), these are a lot of protuberance has distributed. Some tool mark that is cause of protuberance distribute similar to Toni bay, but most of current mark show scour mark.

Tsunami origin submarine topography has almost same character (ex. Water depth) at both bays. But formation factor is different from Toni and OKirai bay.

Keywords: Tsunami orijin submarine topography, Toni Bay, Okirai Bay, Current mark