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Characteristic of tsunami deposit left by 2011 Tohoku earthquake, case study of Hirota bay

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The recent 2011Tohoku tsunami strongly affected the coastal area of the Pacific coast of Tohoku. The study of onshore features for tsunami impact is well researched, but offshore is only a few researches. In this presentation, we will show about characteristic of tsunami deposit left by 2011Tohoku earthquake at Hirota bay using by Sub bottom profiler (SBP) and Vibration core sampler (VCS).

We took the total 17sites columnar core (2012:5sites, 2013:12sites) at water depth 8-25 m. The columnar cores were able to sectionalize to 2 units from lithofacies. Unit-1 consists of sand layer and Unit-2 consists of muddy sediment.

Unit-1 was sand to silt sediments layer with grading (fine to very coarse consists gravel and shell fragments) and lamination, and has forms the erosion surface with the lower layer. We assume that denudation is boundary of previous or after tsunami sediment and upper layer (Unit-1) is 2011tsunami deposit. And, Unit-1 was able to sectionalize to some subunits (Unit1a-1e) by grain size analysis and soft X-ray photo.

Unit-2 was massive sediments with fine sand to silt layer characterized by bioturbation. We assume this unit is normal sediment in this bay. And, some columnar cores have Unit-3(underlying layer of Unit-2) that has similar characteristics of Unit-1.

We estimate the 2011tsunami deposit distribution with thickness approximately 20-50 cm, and high thickness area was valley axis and estuarine region, and those area have sedimentation axis each other (NNW-SSE and NW-SE), and join together at offshore area (around 20m). So, tsunami deposits become thicker by overlap with a few tsunami deposits at offshore area.

Keywords: Tsunami deposit, Sanriku coast