

HQR022-01

Room:201A

Time:May 24 14:15-14:30

An experimental imaging of lateral facies change of unusual tsunami deposits on the Ground-Penetrating Radar profile und

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Ground penetrating radar (GPR) is a geophysical profiling method based on propagation and reflection of electromagnetic waves. This method is recently used for geomorphological and geological survey under the marsh, because it is effective for the imaging of the shallow underground less than 10 m depth. In June 2008, the mega-trench excavated in the central part of Nanbuto marsh with the cooperation of Nishio (Construction Ltd.) in Nemuro, then we identified huge erosional surfaces with peat clasts and 16 layers of giant tsunami deposits in the peat bed was deposited on the past since 5500 years BP and tsunami stratigraphy was confirmed here. In November 2009, we observed lateral facies variation of giant tsunami deposits on the mega-trench wall (100m width) of Katsuragi quarry in the southwestern part of Nanbuto lowland with the cooperation of Daiichisangyo (Construction Ltd.). In November 2010, we set the ground penetrating radar survey lines on the top of mega-trench walls and tried to image the lateral sedimentary facies change of giant tsunami deposits. In this exploration, we used two GPR systems, pulseEKKO100 (200 MHz) and Noggin 250MHz produced by Sensors & Software Inc. The interval of observation of pulseEKKO100 was 0.25 m and its Noggin 250MHz was 0.05m, and the exploration depth was shallower than about 6m but we got high-resolution images (15-20cm). In our presentation, we show experimental imaging of sedimentary facies under the Nanbuto marsh in Nemuro lowland using our GPR method, and also we show GPR imaging is a good method to identify giant tsunami traces under the marsh.

Keywords: ground-penetrating-radar, marsh, unusual tsunami deposit, lateral facies change, experimental imaging, Nemuro lowland