

Mass Transfer deposits along the splay fault Nankai Trough, Kumanonada: Deformation structure and transfer direction of

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Integrated Ocean Drilling Program Expedition 333 was conducted to core a slope site (C0018) for NanTroSLIDE (Nankai Trough Submarine Landslide History) project. A stacked mass transport deposits (MTDs) recognized in 3-D seismic data in the slope basin of the megasplay fault, offshore Kii Peninsula was cored in order to establish a mass-movement event stratigraphy and analyze its rheological property to constrain sliding. Several slid sediments forming MTDs were recovered. Various types of deformation structures, which were formed during sliding were found in the MTDs intervals. The depositional timing of the MTDs sequence was constrained by biostratigraphy, paleomagnetostratigraphy, and tephrostratigraphy. It indicates that all MTDs were formed within 1Ma.

In the area of upper slope of C0018 prominent arcuate scarps caused by submarine landslide are identified. It is supposed that those collapsed materials were sources for MTDs. To document characteristics of the scarps and MTDs of the area, detail surface and subbottom observations were conducted using Navigable Sampling System (NSS) of Atmosphere and Ocean Research Institute, Univ. Tokyo. The youngest MTD layer (MTD1) is interbedded 1.3 m bellow sea floor with 3-m thickness at C0018. In order to understand a transport direction of MTD1, 1) tracking the layer using a subbottom profiler equipped with NSS, and 2) sediment sampling for structural reconstruction of deformed layer to infer a slope sliding direction were conducted. The subbottom images acquired by NSS represent that MTD1 reveals a channeling structure extending to NW. Reoriented folding axes of deformation layers show NW-SE trending. A sliding direction of MTD1 was inferred as a perpendicular direction to the folding axes, which coincident with the channeling structure in the subbottom images. The method described above may elucidate a rheology of MTDs, and can be applied to the analysis of the other MTDs. Because the scarps distribution is along around a surface location of the splay fault, it is supposed that the surface collapses were induced by the fault activations. Thus establishing a stratigraphy of MTDs is important to understand hazardous events occurred near the surface in the great earthquake rupture zone off Kumano.

Keywords: Submarine landslide, splay fault, Nankai Trough