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Summary of IODP Expedition 333: Drilling of Subduction input sediments, and mass transport deposits

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Expedition 333 was conducted to core a slope site for NanTroSLIDE (Nankai Trough Submarine Landslide History) project and input sites on the Shikoku Basin as a part of the NanTroSEIZE (Nankai Trough Seismogenic Zone Experiment) project. A stack of mass transport deposits (MTDs) recognized in 3-D seismic data of the slope basin seaward of the megasplay fault, was cored at Site C0018 in order to establish a mass-movement event stratigraphy and analyze rheological property to constrain sliding mechanism. Several MTDs were recovered, comprising various kinds of deformation structures formed during sliding. A rhythmic turbidite sequence was recovered beneath the MTD sequence, suggesting a significant change of sedimentary environment around 1Ma.

In the input site, C0011 on the northwest flank of Kashinosaki Knoll, and C0012 on top of the Knoll were cored. The late Pleistocene ? late Miocene Shikoku Basin facies and an underlying volcanoclastic sand facies were recovered at C0011. Shipboard measurements reveal pronounced physical property changes occurring within the Shikoku Basin facies. The same change is also recognized in Muroto and Ashizuri input sites offshore the Shikoku Island. The recovered sequence at Sites C0012 reveals a similar lithology to that of C0011. However, at Sites C0012 the sequence involves an early Pleistocene-late Pliocene hiatus of a few m.y. Steeply inclined bedding in the interval of 15-85 mbsf suggests that the hiatus is due to a large-scale slumping. Site C0012 was deepened up to 630.5 m, and heterogeneous alternation in recovered basaltic rocks was found. Strata temperature data were obtained during HPCS operation at both C0011 and C0012 sites. Preliminary estimation reveals the higher temperature gradient at C0012. Analysis of sediment and basaltic basement composition, geomechanical experiments and hydrological modeling will provide a complete characterization of incoming sediments and igneous basement prior to their arrival at the subduction front and seismogenic zone.

Keywords: NanTroSEIZE, NanTroSLIDE, input site, submarine landslide