

IODP Expedition 338 掘削概要

Preliminary results of IODP Expedition 338: Operational aspects

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The Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) is a multi-disciplinary scientific project designed to investigate fault mechanics and seismogenesis along subduction megathrusts through reflection and refraction seismic imaging, direct sampling, in situ measurements, and long-term monitoring in conjunction with laboratory and numerical modeling studies. As part of the NanTroSEIZE program, operations during Integrated Ocean Drilling Program (IODP) Expedition 338 were planned to extend and case riser Hole C0002F located at the southeastern margin of the Kumano forearc basin, begun on Expedition 326 in 2010, from 856 meters below the sea floor (mbsf) to 3600 mbsf.

Riser operations extended the hole to 2005.5 mbsf, collecting a full suite of logging- and measurement-while-drilling (LWD/MWD), mud gas and cutting data. However, due to damage to the riser during unfavorable winds and strong current conditions, riser operations were cancelled. Hole C0002F was suspended at 2005.5 mbsf, but left for re-entry during future riser drilling operations, which will deepen the hole to penetrate the megasplay fault at about 5000 mbsf. Contingency riserless operations included coring at Site C0002 (200-505, 902-940 and 1100.5-1120 mbsf), LWD at Sites C0012 (0-709 mbsf) and C0018 (0-350 mbsf), and LWD and coring at Sites C0021 (0-294 mbsf) and C0022 (0-420 mbsf).

Combined primary riser operations and contingency riserless operations at Site C0002 allowed to sample the upper part of the forearc basin sediments and gas hydrate zone, the basal Kumano Basin-to-accretionary prism unconformity, and the upper portion of the inner wedge with cores, drill cuttings, mud gas sampling, and an extensive suite of LWD logs.

Site C0018 is located within a depocenter for downslope mass transport in a slope basin seaward of the megasplay fault, and was drilled and sampled during Expedition 333 targeting mass-transport deposits (MTDs). Site C0021 is located ~2 km NW of Site C0018 and at a more proximal site for MTDs observed at Site C0018. LWD at Site C0018 provided logging data to characterize the sedimentary section and MTDs, which are correlatable with the previous core and seismic data. LWD and coring at Site C0021 provided data for correlation to Site C0018. Together the sites provided constraints on the lateral variability of MTDs within the basin, which relates to the nature, provenance, and kinematics of the submarine landslides.

Site C0022 is located in the slope basin between previously drilled Sites C0004 and C0008. LWD and coring at this site penetrated through the tip of the megasplay fault, and provided constraints on the activity of this megasplay fault.

Site C0012 is located in the Shikoku Basin on the crest of a prominent basement high (Kashinosaki Knoll) on the subducting Philippine Sea plate, where coring down to 630.5 mbsf had been conducted during Expeditions 322 and 333. LWD operations at this site provided logging data to characterize the sedimentary section and the upper portion of the oceanic crust, which are correlatable with the previous core and seismic data.

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