

The Nankai OOST zone exposed along the Shionomisaki Submarine Canyon

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The Shionomisaki submarine canyon cut five major EW-trending ridges developed in the Plio-Pleistocene Nankai accretionary prism. The fifth ridge (numbered from the accretion toe in the south) is an extension of the Omine ridge where the out-of-sequence thrust (Nankai OOST zone) were detected through CDEX seismic profiles. We observed structures developed around the Nankai OOST zone along the eastern canyon slope using submersible Shinkai 6500 during JAMSTEC cruises YK00-08 and YK05-08. Each dive was designed to start from the canyon bottom, climbing up the canyon slope and end in EW-trending gully developed in the fifth ridge, to obtain a 3D images of the Nankai OOST ridge. Four dives (6K#579 and 6K#889 ~6K#891) verified that Shionomisaki Canyon exposes sandstone dominant thick turbidite sequences. Southward dipping strata were predominant in gently folded, often steeply inclined strata. Only near the Nankai OOST zone, extensive activities of fluid seepages were observed demarcated by the presence of chemosynthetic biocommunities, such as Calyptogena and Vesicomid clams and Vestimentiferan tube worms. Distributions of the chemosynthetic biocommunities were also observed in the north of the Nankai OOST ridge suggesting a development of antithetic fault system. The ridge itself was disrupted by numerous EW-trending gullies where Calyptogena colonies were widely distributed. These gullies must correspond to spray faults that were bifurcated from the main OOST fault. Detailed observations on collected specimens revealed developments of web and vein structures together with black seams. Needle test indicated that the rocks in the middle part of the OOST ridge is more consolidated compared to those of the north and south exposures.