

Cold Seeps and Their Tectonic Implications in the IODP NanTroSEIZE Drilling Area

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<http://ofgs.ori.u-tokyo.ac.jp/~ofgs/ashi/ashi-j.html>

The seismogenic zone drilling NanTroSEIZE will start from fall 2007 in the central Nankai Trough, where the seismic rupture zone of the 1944 earthquake extends to the splay fault area and the penetration depth to the target is acceptable for riser drilling technology. Series of dive cruises using submersibles since 2001, conducted as site surveys for drilling proposals, revealed the cold seep distributions, fluid chemistry, thermal structure and geological structures. The densest chemosynthetic biological communities are observed along the scarp base of the splay fault. This site is characterized by high heat flow, low chlorinity pore fluids and high total count of natural gamma ray, suggesting up-dip migration of fluids through the fault plane, probably from the deep prism. Recent dives deployed four seep-meters for one year monitoring and discovered the whitish-yellow colored chimney with living tubeworms. The chimney sample had strong hydrogen sulfide smell and consists of barite crystal with high content of uranium series radionuclide. Sediments including barite cause high total count of natural gamma ray along the scarp base. Existence of chimney at the base of the unstable scarp suggests its recent rapid growth probably due to episodic fluid expulsion.