

The geological structures to the south of the Yaeyama Islands deduced from submarine topography and MCS reflection data

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The Nansei-Shoto Trench is where the Philippine Sea plate is subducting beneath the Eurasian plate. In the southern part of the Nansei-Shoto Trench, the Yaeyama earthquake accompanied a large tsunami killed about 12,000 people in 1771. However, few numbers of structural studies in this region have been carried out compared to those in the Japan Trench and the Nankai Trough regions.

In order to understand characteristics of earthquake occurrence in the Nansei-Shoto Islands, we need the topographical and geological information about Nansei-Shoto Trench.

Japan Coast Guard has been carried out bathymetric, seismic refraction, and multi-channel seismic (MCS) reflection surveys around the Nansei-Shoto Islands. We conducted a seismic survey on an N-S survey line across the forearc basin to the south of the Yaeyama Islands in 2009.

The landward slope of the trench to the south of the Yaeyama Islands is an accretionary wedge with a width of about 50km. To the south of the Yonaguni Island, a linear right-lateral fault with WNW-ESE direction exists at the boundary between the forearc basin and the accretionary wedge (Lallenamd et al.1999.).

On the MCS profile across the right-lateral fault to the southeast of the Ishigaki Island, a flower structure is confirmed around the boundary between the accretionary wedge and the forearc basin. A strong reflector corresponding to a plate boundary is recognized beneath the forearc basin region. This reflector is confirmed to extend to about 50km north from the escarpment at a depth of 20km from the sea surface.

Keywords: Nansei-Shoto trench, Multi-Channel Seismic profile, submarine topography