The modern depositional and morphological characteristics of the SW Ryukyu subduction zone

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The southwestern Ryukyu Trench receive an amount of sediments from Taiwan longitudinally and the trench morphology is truncated by the collision of Gagua Ridge from the south. Previously, we developed the modern sediment transport model in terms of source-to-sink in the southwestern Ryukyu Trench. In order to further understand the modern depositional and morphological processes across the southwestern Ryukyu subduction zone, the surface sediments for this study were collected using the deep-diving submersible SHINKAI 6500 during cruise YK16-11 in 2016. The trench floor surfaces show relatively flat and stable depositional environment. In contrast, the sediment surface of the forearcs shows micro-topographic mounds, depressions, and tracks formed by fauna activity. Two push cores (1467G, 1467R) were collected from the Ryukyu Trench floor and two from adjacent forearcs (1468, 1469) from four discrete locations. Each push core depth is about 35 cm. The microstructural features of the hemipelagic sediments were analyzed by using CT-scan and X-ray images. The very-thin laminated fine-grained clay beds can be observed from the Ryukyu Trench floor (1467G, 1467R), which at almost 6,500 m depth represents the regional deepest oceanic site in the Ryukyu subduction zone. Heavy bioturbation and relatively high magnetic susceptibility records occurred in the cores 1468 and 1469, indicating the varies depositional environment of the Ryukyu forearcs. Physical properties (gamma-ray density, magnetic susceptibility, and p-wave velocity) are acquired with the use of a Multi-Sensor Core Logger (MSCL). The importance of this study is not only to observe the turbidite records but also to evaluate assessments of natural hazards of subduction zones. The southwestern Ryukyu Trench floor can be regarded as the most distal depositional basin and isolated from the Ryukyu forearcs by Yaeyama Ridge. The modern depositional and morphological characteristics also show distinct results in trench floor and forearcs.

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