

Export and deposition of small river particles in the Okinawa Trough under the influence of topography upwelling

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Particle export from small rivers of the oceanic island is a major source of sediments to the ocean. Earlier study indicated that deposition on the foreland basin and further transport offshore to the deeper ocean through submarine canyon maybe two major forms of sediment burial at the ocean environment near small river. In this report, we study particle export and deposition at a rift basin under strong influence of an adjacent boundary current, the Kuroshio. 60 stations of box and gravity cores were taken and analyzed for grain size, Pb-210 sedimentation rate, organic carbon, carbonate carbon, organic C/N ratio and organic carbon stable isotopic C13/12 ratio.

Lanyang River, located at northeastern Taiwan, is a small river of only 73 km long with a drainage area of ~1000 km². The area receives high precipitation and exports an average of 7 M t of suspended particle to the ocean.

Our results show that large sedimentation rates variations were observed. Multiple depositional highs indicating more than one source of suspended particle entering the area. The highest sedimentation rate observed was not at the river mouth but at further distance where canyon slope become gentle. Another higher sedimentation rate was observed further away from river at continental slope near another canyon. Furthermore, unusually high activity of excess Pb210 (approximately 10x more) were observed at surface sediments at a region under the topography upwelling area. The results demonstrated that sediments were re-suspended, scavenged extra Pb210 from the water column and later deposited with enriched Pb-210. Our results also show that about 7 Mt of sediments deposited in region near the Lanyang River, approximately equal to the amount of Lanyang River sediment exported to the ocean.