Geophysical Research Abstracts
Vol. 21, EGU2019-2534-2, 2019
EGU General Assembly 2019

Submarine erosion in the Kenting plateau, northern Manila accretionary prism, offshore southern Taiwan

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The Kenting Plateau has documented unusual topographic low relief surfaces that straddle the topographic crest of the northern Manila accretionary prism. It has a dimension of 35 km x 30 km and the water depth ranges from 60 m to 600 m. In the northern part, the plateau is comprised of an even surface having an average water depth of 500 m while in the SE part, there is an elevated flat area “Kuroshio Knoll”, having a water depth of 60-70 m and a dimension of 3 km x 7 km. In order to document the submarine erosion, we have combined bathymetric data, Acoustic Doppler Current Profiler (ADCP) data and reflection seismic data with samples (gravity cores and gravels) collected from the plateau and its nearby perched basins. The southern part of the plateau comprises of hard rocks and relatively few mud diapirs as compared to the northern part which is abundant in mud diapirs along with a few mud volcanoes. One branch of the Kuroshio Current passes through this plateau and enters into the South China Sea. The thickness of the Kuroshio current is around 600 m. The velocity of the Kuroshio Current observed from the ADCP data on the Plateau surface reaches up to 0.5 m/s and up to 1 m/s on top of the Kuroshio Knoll, indicating erosion on the plateau surface, in particular on the Kuroshio Knoll. The P-wave velocity of the gravels collected from the plateau ranges from 3.2 - 4.5 km/s, implying the burial depth of parent rocks of the gravels in the range of 2.3-4 km below the seafloor. The parent rocks have been uplifted due to erosion of the plateau, as a result of isostatic rebound. The sand and silt contents of the cores collected in basins around the plateau show a decreasing trend in grain size away from the plateau, suggesting that submarine erosion is effective, thereby accumulating coarser sediments on the plateau and removing fine particles from the plateau, depositing in distal regions. Along with the erosion-induced isostatic rebound, the seismic lines in the plateau show the doubly-vergent thrusts on both sides of the plateau, which contribute towards the growth of the prism.