



The Donghae submarine canyon in response to sea-level variations on the western margin of the East Sea, Korea

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The Donghae submarine canyon is developed a relatively gentle (approximately 1.5°) continental slope on the western margin of the East Sea. We used the multi-beam bathymetry and the high-resolution subbottom profiles to interpret the origin of the canyon in relation to sea-level variations. The acoustic basements are exposed on the seafloor in a relatively narrow continental shelf (> 10 km wide) near the shelf edge. This is the evidence of presence of intermittent river for direct sediment supply from mountain streams to river mouth near shelf edge during the sea-level lowstand. The Donghae canyon (approximately 30 km long) is confined to the continental slope between the shelf edge and the base of slope. The canyon head starts at water depths of 125 m and extends to 550 m. In the upper canyon, the incision is approximately 30 m deep and 200 m wide with sinuous bend. The middle canyon exhibits terraces along the margins. The lower canyon is characterized by wide (1000 m) and deep (70 m) incision. The numerous gullies cut across the broad lower canyon. As a result, morphology of the Donghae canyon allows us to understand the mechanism of canyon formation. The initiation of the Donghae canyon was strongly controlled by high sediment supply because the intermittent river mouth reached the shelf edge during the sea-level lowstand.