



The geomorphologic changes of two barrier islands in southwestern Taiwan

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There are two barrier island types along the southwestern coast of Taiwan, each with different morphologic characters. Ever since the land reclamation in coastal areas a quarter of century ago, only one barrier island of each type, the Wantzuliao Barrier and the Waisanding Barrier, remained as the remote land that can be accessed only by boat. Analyses of historical maps, aerial photographs, satellite images and the ground surveys of cross-island profiles reveal that both barrier islands have undergone dramatic geomorphologic changes in recent decades. The Wantzuliao Barrier, a relatively long and narrow barrier with lower elevation in the northern part tends to be vulnerable to the storm waves that the island had been breached several times since late 1999. The foredunes were washed away and the elevation is lowered to form a wide sandy tidal flat. The shoreline has retreated over one hundred meter in the southern reach where the original wide beach has disappeared, and erosional dune cliffs have formed in front of an artificial forest. The Waisanding Barrier, a relatively shorter and wider barrier, tends to migrate in a southeast direction. The ocean-side shoreline retreats at a very fast rate. Foredunes are washed away, and the elevation of the whole island is lowered. The overall land area has also shrunken. All these changes are mainly due to the large negative balance on the sediment budget of the barrier island. A positive feedback mechanism may also worsen the situation. This resulted in the original back shore and dune field area developing into a wide sandy tidal flat with many shallow tidal creeks forming during rising high tide stages. Although both islands remain natural, the geomorphologic changes on both islands are enhanced by the human agent. In comparison to the coastal erosion trend in the last century, the human interference of the coastal processes by the engineering structures in recent couple decades may induce faster shore erosion and affect larger area.