



The changing of coastal landform at Chikou barrier island and lagoon coast, Tainan, Southwestern Taiwan

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The coast of southwestern Taiwan is mainly made of barriers and lagoons, which are prone to erosional and depositional processes. By using a serial maps, historical survey data, and RTK-GPS survey data, the changes of coast landforms are depicted. The maps being used in this study include (1) 1904 map(1:50000 scale), (2) 1920 map (1:50000 scale), (3) 1921 map (1:25000 scale), (4) 1924 map (1:25000 scale), (5) 1956 map (1:25000 scale), (6) 1975 map with ortho-rectified image (1:5000 scale), (7) 1983 map with ortho-rectified image (1:5000 scale), (8) 1989 map with ortho-rectified image (1:5000 scale), (9) 1992 map with ortho-rectified image (1:5000 scale), (10) 2001 map with ortho-rectified image (1:5000 scale). All maps are scanned and georeferenced to build a GIS archive for digitizing and further analysis. The results show that this coast was made of continuous sand barriers and lagoons. While lagoons were gradually shrinking, the sand barriers had remained stable from 1904 to 1924. After that, lagoons substantially deposited in the southern part and sand barriers became landward. In 1975 map, lagoons vanished and replaced with a tidal flat and tidal creeks. The following maps show that lagoons start to form again and sand barriers moving landward continuously. It is a significant sign of serious erosion in the coast. The RTK-GPS survey data in recent years show more detail of coast erosion and landform changes. The post-typhoon investigation results show that the seaward side of barrier island is eroded largely, especially for the two segments of the central part of the barrier island. Some depositions were found on the top of northern and central part of barrier dune, as well as washovers. In the southern barrier island, the depositions were carried to backshore and were obstructed in front of the bamboo piles and marine solid bags. The survey indicated the areas eroded by storm surge were gradually accumulating except for the beaches separate with plastic sheet piles and marine solid bags, especially the northern section-north, after the Typhoon Megi happened two month. In late February of 2011, there are some deposition on the top of primary dune, backdune and tidal flat. But the parts of seaward beach which wave can reach are continuously eroded, especially the central segment of the barrier island is mostly vulnerable. In particular, the latter part of southern beach was accumulated, concerning with alongshore current transport. In the late winter monsoon season, elevation changes are smaller than in the medium, corresponding with the wave condition. The latter part of south section begin to be eroded, the sediments may be taken away by the southward current. Area A, located the central of barrier island, attacked by wave continuously, elevation of dune decrease constantly, and then overwashed frequently.

Keywords: sand barrier and lagoon coast, archive map analysis, RTK-GPS survey, overwash