A STUDY ON SPATIAL AND TEMPORAL VARIATIONS OF COASTAL WETLAND IN PEARL RIVER ESTUARY

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Abstract: Great changes of coastal wetland in Pearl River Estuary have taken placed since 1970s. To investigate the spatial and temporal variations of coastal wetland in Pearl River Estuary, Landsat-MSS images in 1975 and Landsat-TM images in 1995 & 2005 were processed, and a wetland database of these three periods was established based on these satellite images. Since the changes of coastal wetland had significant relationship with coastline displacement, a model for coastline displacement detection was established. By means of GIS and RS, temporal and spatial changes of coastal wetland in Pear River Estuary were studied in this work. The result showed that: (1) During period of 1975~1995, coastal wetland area decreased by 3.3%, and decreased by 18.3% during 1995~2005; (2) Among 6 administrative districts of the study area, wetland dynamic degree could be sorted in a descending order as: Zhuhai, Shenzhen, Macao, Dongguan, Zhongshan and Guangzhou; (3) The centroids of wetland in Pearl River Estuary coastal zone moved 0.6km in the north direction during 1975~1995, and 6.1km in the southeast direction during 1995~2005; (4) Due to the displacement of coastlines in Pearl River Estuary, the area of sea reclamation during 1975~2005 in Zhuhai, Macao, Zhongshan, Guangzhou Dongguan, Shenzhen was 12439.29，502.60，2946.45，5372.21，1815.96 and 6317.88 hectares respectively; (5) Average distance of coastline displacement during 1975~2005, was 651.2m in Zhuhai, 187.1m in Macao, 1304.7m in Zhongshan, 802.8m in Guangzhou, 193.3m in Dongguan and 523.1m in Shenzhen. To conclude, this work demonstrates the importance of satellite images to monitor the temporal and spatial changes of coastal wetland.

Key words: Pearl River Estuary, Coastal Wetlands, Dynamic Degree, Centroid Displacement

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