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The coastal erosion and evolution of the Yellow River Delta abandoned lobe

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A statistic analysis predicting coastal change of the Yellow River abandoned delta lobe formed from 1964 to 1976 using Landsat TM imagery was conducted by calculating the coastal erosion/accumulation rates obtained from four different classic profiles and plotting the change curves of coastline with time. The studies showed that the regularity of the evolution of the coastline was very obvious after the delta lobe was abandoned. The coastal evolution can be divided into three different phases: erosion phase, transition phase and cyclical change phase. At present, the coast has evolved to the cyclical change phase. The natural coastline change cycle is 4 years between the dam and is 5 years to the west of the dam. In the cyclical change phase, the quasi-equilibrium line of the coast was located near the coastline of 1996, the current coast may recede 1.79 km to reach the natural equilibrium coastline. Therefore, some measures must be taken to protect the dam or the dam will be destroyed by the force of nature. The curves also revealed the magnitude of erosion/accumulation rates would decrease gradually with time. The results of the study offer guidance for coast protection, and proves that the evolution of silty coast actually was a cyclical change process too.

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关键词: Landsat TM remote sensing; Yellow River Delta; coast erosion; erosion quasi-equilibrium line doi: 10.1360/gso40409