THE EROSIONAL PROCESS OF THE SOFT SHORE OF CHINA IN THE RECENT DECADES

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ABSTRACT: Coastal erosion phenomena in China have become increasingly evident since the end of the 1950s, and the process of coastal erosion has been speeding up since the end of the 1970s. Almost all the coastal types, the rock coasts, the muddy coasts, the sandy coasts, the coral coasts, etc. on 32,000-km long coastline of China are in danger of erosion, especially the beaches in open coasts and the coasts of abandoned river deltas. Although coastal erosion phenomena are extensively distributed in China, the intensities of erosional processes in different regions are quite different. There are various causes of coastal erosion in China, and different factors often concurred in the coastal erosional processes. The main causes for coastal erosion are sand exploitation on shores and the decrease in river sediment discharges. Coastal erosion process has endangered the houses, roads, engineering works and tourism resources in the coastal zones.

KEY WORDS: soft shore, coastal erosion

I. INTRODUCTION

The problem of coastal erosion attracted great attention of the governments and scientists of the maritime countries in the world early in the 20th century. The British established the Royal Commission responsible for controlling coastal erosion in 1906, and the commission enacted "The Coastal Protection Act" for two times in 1939 and 1949. Researches on coastal erosion in the United States of America began in the 1930s, and the Coastal Erosion Research Center was established at the same time. The "Research Report on National Coastline" provided by the U.S. Army Corps of Engineers stated that about 1/ 4 of the American coasts were intensely eroded. Later U. S. A. compiled an atlas of coastal erosion distribution, set up a data base of shoreline changes and an information system of coastal erosion. The Japanese noticed the impacts of coastal erosion very early, and has enhanced its coastal protection works. The former Soviet Union enacted "The Law for Beach Protec-
tion in the Black Sea* in 1962, and promulgated the relevant regulations prohibiting sand exploitation on shores and factory establishment within the 3–km wide coastal zone. In 1972, International Geographical Union established a working group for the research of coastal erosion dynamic. In 1976, Prof. Bird of the University of Melbourne, Australia, made a comprehensive analysis on the data provided by his colleagues and compiled a famous report “Shoreline Changes during the Past Century” which stated that during the past 100 years, the coasts of all countries in the world had been extensively subjected to erosion. What a pity this report failed to include the data of China. Today this research program has been brought into the plans of the International Scientific Committee on Oceanic Research (SCOR), and a working group for sea level changes and world shoreline erosion has been established.

Thirty–odd years ago, the most coasts of China were slowly prograding or maintained in a stable state, except for a few abandoned river deltas which retrograded due to erosion (1–2). Since the end of the 1950s, the direction of shoreline migration in China has been reversed. Most sandy shores, muddy flats and coral reefs have been subjected to erosion instead of progradation, resulting in shoreline retrogradation. According to field investigations and observations, about 70% of sandy shores and most muddy flats along open coasts are now subjected to erosion, which has exerted a tremendously serious impact on the life and production activities of the coastal people, and has caused a huge sum of economic loss.

The increasingly intense coastal erosion in China has been followed with interest by marine scientists and relevant governmental departments of the country. Wang Wenhai (3), Li Guangtian (4), Zhuang Zhenye (5) and others made researches on the erosion processes along some coastal sections and analysed the causes for coastal erosion. Nanjing Hydraulic Research Institute and some other institutions of Jiangsu Province have conducted long–term spot observations and monitoring of the erosion processes of the coast of the abandoned Huanghe (Yellow) River delta and the Lusi Town coast in Jiangsu, through which they have acquired valuable data on this subject. And based on these data, they have taken some engineering measurements to control the erosion processes (6–7).

Although quite a few marine scientists have started to study the phenomena and causes of coastline retrogradation in China, the work done is still limited in some local areas.

II. CASES OF COASTAL EROSION IN CHINA

1. Liaoning Province