



Research on vulnerability assessments of the Huanghe (Yellow River) delta

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Coastal zone located at the juncture of the sea, river and land, and under the influence of both land and ocean (including atmosphere), especially the sea-level rise and human activities, are vulnerable to environment and ecology. At highest risk are coastal zone of South, Southeast and East Asia with dense populations, low elevations and inadequate adaptive capacity. In China, more than 40% of the population live on the 15% of the land in coastal area and more than 70% cities located around the coastal area. The Chinese coastal region, especially river delta area has been experienced erosion, seawater intrusion and decrease in biodiversity under the combined influence of sea-level rise, tectonic subsidence and flooding. Furthermore, some kinds of human activity, such as land use, building, dam construction, reclamation from the sea and waste dumping strengthen the vulnerability of environment and ecosystem in coastal region.

The coastal hazards (e.g. coastal erosion, seawater intrusion, land subsidence) and vulnerability of the Huanghe (Yellow River) delta area are studied during the past several years. A systematic coastal assessment index is built and an evaluation model is developed using the development platform of Visual studio.Net 2005. The assessment index system includes two parts, inherent (sea level rise rate, elevation, morphology, water and sediment discharge, mean tidal range, mean wave height etc) and specific vulnerability index (population density, GDP, land utilization, protection structures etc). The assessment index are determined the weight using Analytic hierarchy process (AHP) method. Based on the research results, we better understand the current status and future change of coastal vulnerability and hazards, discuss the impact of the natural possess and human activities. Furthermore, we provide defending strategies for coastal zone vulnerability and typical coastal hazards.