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Analysis of Climate Change in the Coastal Zone of Eastern China, against the Background of Global Climate Change over the Last Fifty Years: Case Study of Shandong Peninsula, China

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ABSTRACT

The climate change in Shandong Peninsula, China was analyzed in this paper by the non-parametric Mann-Kendall test, Accumulated Difference Curve and Order Cluster Analysis methods, based upon the datas of annual mean, maximum and minimum temperature and annual precipitation, precipitation from June to September over the past 50 years. Results obtained showed a number of observations: 1) The annual mean temperature of Shandong Peninsula showed a significant increasing trend, with a distinct abrupt change point detected around 1990, during the past 5 decades. The warming of the Peninsula over the last 50 years was due mainly to the significant increase of annual minimum temperature. The annual maximum temperature demonstrated a mixed trend of decreasing and increasing, but was statistically insignificant, and no abrupt change was detected; 2) The annual precipitation exhibited a decreasing trend during the past 5 decades, with an abrupt change detected around 1980 at most stations; but there was an earlier transition point at 1966, at a few stations. The reduction in precipitation, from June to September, was responsible mainly for the decrease of annual precipitation. Besides, the proportion of the June-September precipitation in the year declined slightly over the last 50 years; 3) In comparison, the temperature evolution in Shandong Peninsula was basically consistent with most parts of China, but warmed at a faster rate over the same period; the decreasing trend of precipitation was more significant compared with the other climate zones of China. Within the Peninsula, the abrupt change of temperature and precipitation in the Southeast was earlier than that in the Northwest; the reduction of precipitation was larger in the Southeast while the increase of temperature was more significant in the Northwest. This research was of great importance to understand the climate change and its environmental effects in the coastal zone.

KEYWORDS

Abrupt Change; Climate Change; Shandong Peninsula in China; The Last Fifty Years; Coastal Zone

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