



## **Climate Extremes Events and their Connection with Runoff in the Yellow River Basin**

Caihong Hu, Deyi Lei, Huli He, and Jijun Wang

Zhengzhou University, School of Water Conservancy and Environment, Zhengzhou, China (hucaihong@zzu.edu.cn)

This study analyzes the temporal and spatial distribution of runoff and their relationship with the extreme values of eight climate indices, based on observational data from 143 meteorological stations and 6 hydrological stations across the basin. The eight core indices selected from the STARDEX projects reflect rather moderate extremes. Statistics methods and GIS technology were used for analysis on the relationship and distribution characteristics. We analyzed the reason of runoff change and the relationship between the climate extreme events and observed runoff from six hydrological stations. Our results show that the annual and seasonal runoff showed obviously decrease tendency. Sharp decreases of runoff in six hydrological stations occurred in the late 1980s and 1990s. It can be seen that the decrease in runoff was caused by climate change, increased demands for water supply, land use change, etc. And the difference between the magnitude of the increasing and decreasing trends for different indices at different stations suggests that the climate extremes and environment change resulted in a decrease in runoff. The results also show that the shortage of water resources will become more pronounced in the Yellow River Basin with the increased occurrence of climate extremes. The results presented here will help to improve our understanding of the changes to climate extremes, and provide a basis for further investigation.