EGU22-3413
https://doi.org/10.5194/egusphere-egu22-3413
EGU General Assembly 2022

Study on the variation and diagnostic methods of eco-hydrological regime in Hanjiang River Basin

Siyu Cai[1] and Zhe Li[2]
[1]CHINA INSTITUTE OF WATER RESOURCES AND HYDROPOWER RESEARCH, BEIJING, China
[2]Hebei University of Engineering, Handan, China

This paper used a long series of daily flow data of Ankang section from 1960 to 2020 to diagnose eco-hydrological variations in the upper reaches of the Hanjiang River. Aiming at the problems of the single hydrological variable used in watershed hydrological variation diagnosis, a method for extracting the most Ecologically Relevant Hydrologic Indicators (ERHIs) based on sensitive indicators of similar years and diagnosing the variation period was proposed. In this method, 32 hydrological indexes in the IHA index system were used to diagnose hydrological variation instead of the traditional single index, and the IHA index were refined into wet season index and dry season index based on different hydrological characteristics. Ten years were randomly selected from the long series flow data as the sample years and ten similar years corresponding to each sample year were selected for the determination of ERHIs. The indexes with strong variation were selected from ERHIs to diagnose hydrological variation. Through comprehensive variation diagnosis calculation, the indexes with strong variation were the annual average duration index of low flow and the annual minimum 1-day flow index, with the period of variation from 1973 to 1977, and from 1973 to 1986, respectively. Combined with the climate change and human activities in the past 60 years, it is found that the time period of climate change and water conservancy project construction is consistent with the time period diagnosed in this paper. Therefore, the variation period from 1973 to 1986 is reasonable. Through this study, it can be concluded that the method has strong practicability in the diagnosis of hydrological variation, and the conclusion is consistent with the practice, which can fully reflect the characteristics of hydrological changes in the Hanjiang River Basin.