

The variation in processes of river connectivity in the Jingjiang River and its influencing factors from 1955-2015

Yin Chen¹, Yangui Wang¹, and Jian Shen²

¹China Institute of Water Resources and Hydropower Research

²Changjing Water Resources Commission

May 5, 2020

Abstract

Rivers with good connectivity are conducive to the development of various functions of rivers, such as hydrological regulation and storage, water and sediment transport, and ecological environment. Human activities have greatly reduced the sediment load in the Yangtze River Basin and have changed the channel connectivity of the Jingjiang River. In this paper, the analytic hierarchy process (AHP) is used to establish the assessment model of channel connectivity based on the river function. Then, combined with the flow, sediment and boundary data of the main hydrological stations, we analyze the variation in processes of the channel connectivity of the Jingjiang River from 1955 to 2015. The results show that the change in process of channel connectivity of the Jingjiang River is basically the same in different reaches. The value of the comprehensive function of connectivity increases gradually with time and is greater than 1.0 after 1990, indicating that the channel connectivity has improved. Spatially, the Shashi-Jianli reach has the best connectivity, while the Zhicheng-Shashi reach has the worst connectivity. In addition, reservoir construction and river straightening are the main factors affecting the channel connectivity of the Jingjiang River system. Soil and water conservation changes the channel connectivity by changing the water and sediment yield, which is the secondary factor. The study means, method and achievement are universally applicable to the evaluation of other channel connectivity.

Hosted file

Manuscript.docx available at <https://authorea.com/users/289694/articles/415957-the-variation-in-processes-of-river-connectivity-in-the-jingjiang-river-and-its-influencing-factors-from-1955-2015>