

# Response of flow capacity of Jingjiang Sankou spillway to variation of upstream water and sediment process

Jian Shen

## Objectives

The Jingjiang section of the middle reaches of the Yangtze River is connected with Dongting Lake, the second largest freshwater lake in China, through three floodways, forming a complex relationship between the river and the lake. The existence and evolution of the three Jingjiang Estuaries is the most active factor in the connection and mutual influence of the Jianghu. It plays a decisive role in the deposition of the Dongting Lake, the regulation and storage capacity of the lake and the change of the process of the lake's confluence and outflow, and also has a profound impact on the evolution of the Jingjiang River. The analysis of the laws of water and sediment transport and bed deformation can provide a basis for the comprehensive utilization of water resources and ecological governance in the lake.

## Methods

Based on a large number of measured hydrological data and river topographic observation data, the variation characteristics of the flow and sediment transport of the Jingjiang main stream before and after the Three Gorges Project is put into operation, as well as the response characteristics of the diversion and sediment distribution of the three outlets and the channel erosion and siltation to the upstream water and sediment variation process are analyzed by using the mathematical statistics method

## Results

The results show that the gate of the three outlets is expanded, and the spillway is generally scoured, with a total scouring volume of 150 million m<sup>3</sup>. Under the same runoff at Zhicheng Station, the diversion ratio of the three outlets has no obvious change. After the operation of the Three Gorges Project, the actual flow capacity of the three ports has not been significantly improved. In addition, in addition to the decrease in the annual cutoff days of the Hudu River, the cutoff days of the eastern branch of the Songzi River and the Ouchi River have increased.

## Conclusions

Summarized the evolution laws of diversion and sediment distribution, river regime, and flood channel erosion and sedimentation in the Koumen section, providing a basis for the comprehensive utilization of water resources and ecological environment protection in the rivers and lakes