

Analysis of Autumn Flood Characteristics, Disaster Impacts and Flood Control Dispatch of the Weihe River.

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Objectives

The autumn flood of Weihe River is an important part of the water resources of the Yellow River. This paper, combining with the management requirements for the Weihe River, intends to discuss the characteristics of the autumn flood of the Weihe River, analysis the impact of its disaster. The research will be of great significance to ensure the stability of Weihe River and promote the utilization of autumn flood resources.

Methods

In the study, field investigation, literature review, data statistics, correlation analysis and other methods were adopted to investigate the information of dike breaches and related reservoirs regulation, compile statistics on rainfall conditions in the River, and sort out the atmospheric circulation monitoring and analysis results, to analyze and present the main conclusions.

Results

(1) According to the criterion that after the summer flood is the autumn flood, the experience frequency of the greatest flood of a year belongs to the autumn flood in Xianyang station (1931-2022 series) is 50.5%, and the experience frequency of the greatest flood of a year belongs to the autumn flood in Huaxian station (1935-2022 series) is 43.8%.

(2) The process of heavy continuous rains of autumn floods in Weihe River can be classified into: short, medium and long periods; The distribution of rain area includes 6 types of 2 categories: oblique type of quadrilateral, triangular and diagonal, and latitudinal type of latitudinal north, latitudinal medium, latitudinal south.

(3) The autumn flood monitored by Huaxian Hydrometric Station in Weihe River in 2021 lasted 836.5 hours, with the flood volume of 5.582 billion m³, only less than "64.9" flood and "03.8" flood. The flood peak monitored by Chaoyi Hydrometric Station in North Luohe River was 0.72m higher than the historic high due to the flood jacking up of Weihe River. Because Chaoyi embankment was constructed in earlier times, there are hidden dangers and the deep alkali-drainage ditch on the backwater side, which are the main reasons for the breaches.

(4) Fengjiashan Reservoir and Heihe Jinpeng Reservoir reduced the flood peak by 40.2%~94.2% and 28.3%~44.9% respectively in autumn flood in 2021.

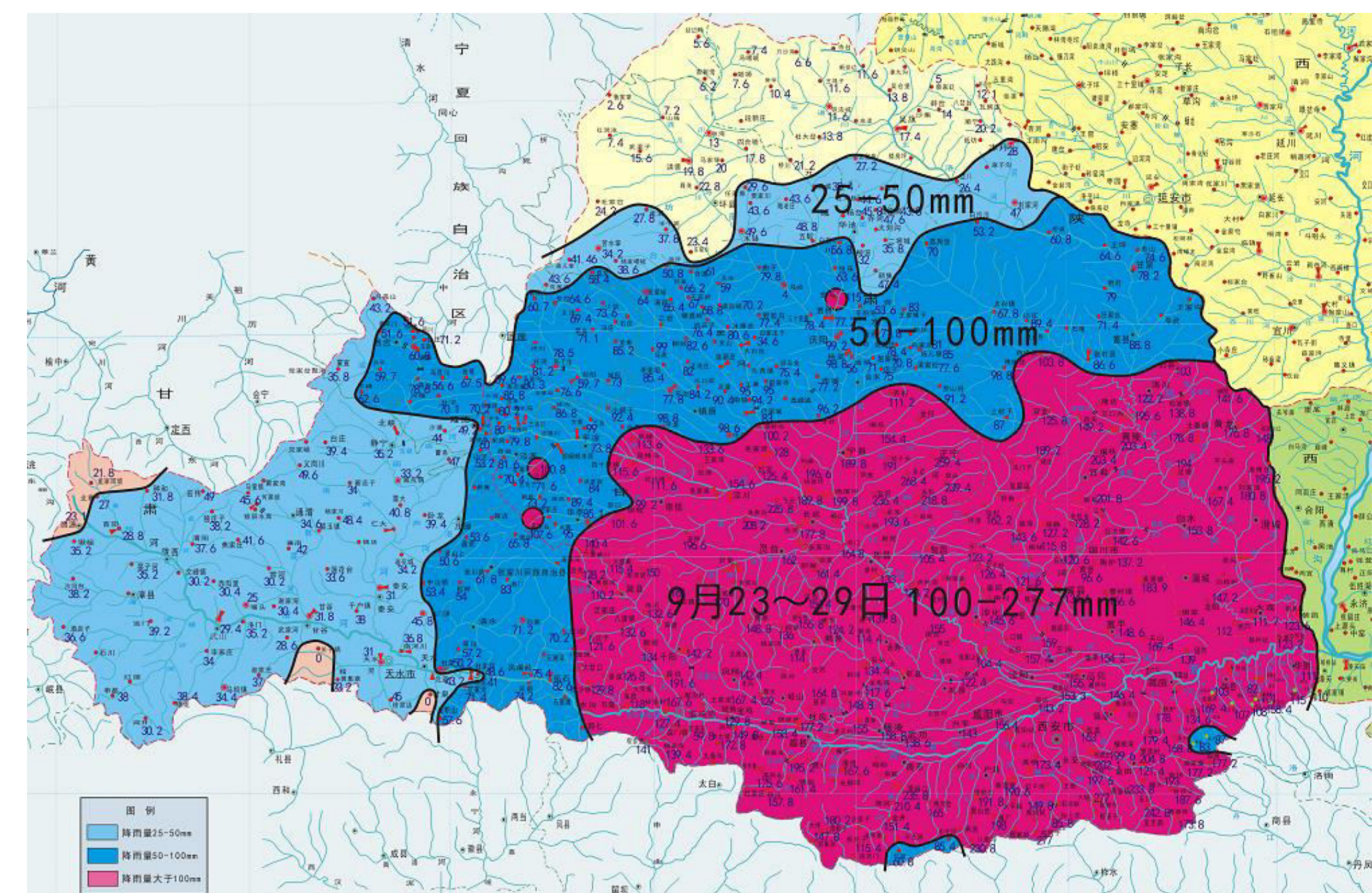


Fig.1 Rainfall isograms for September 23-29 of the Jinghe, Weihe and Luohe River basin

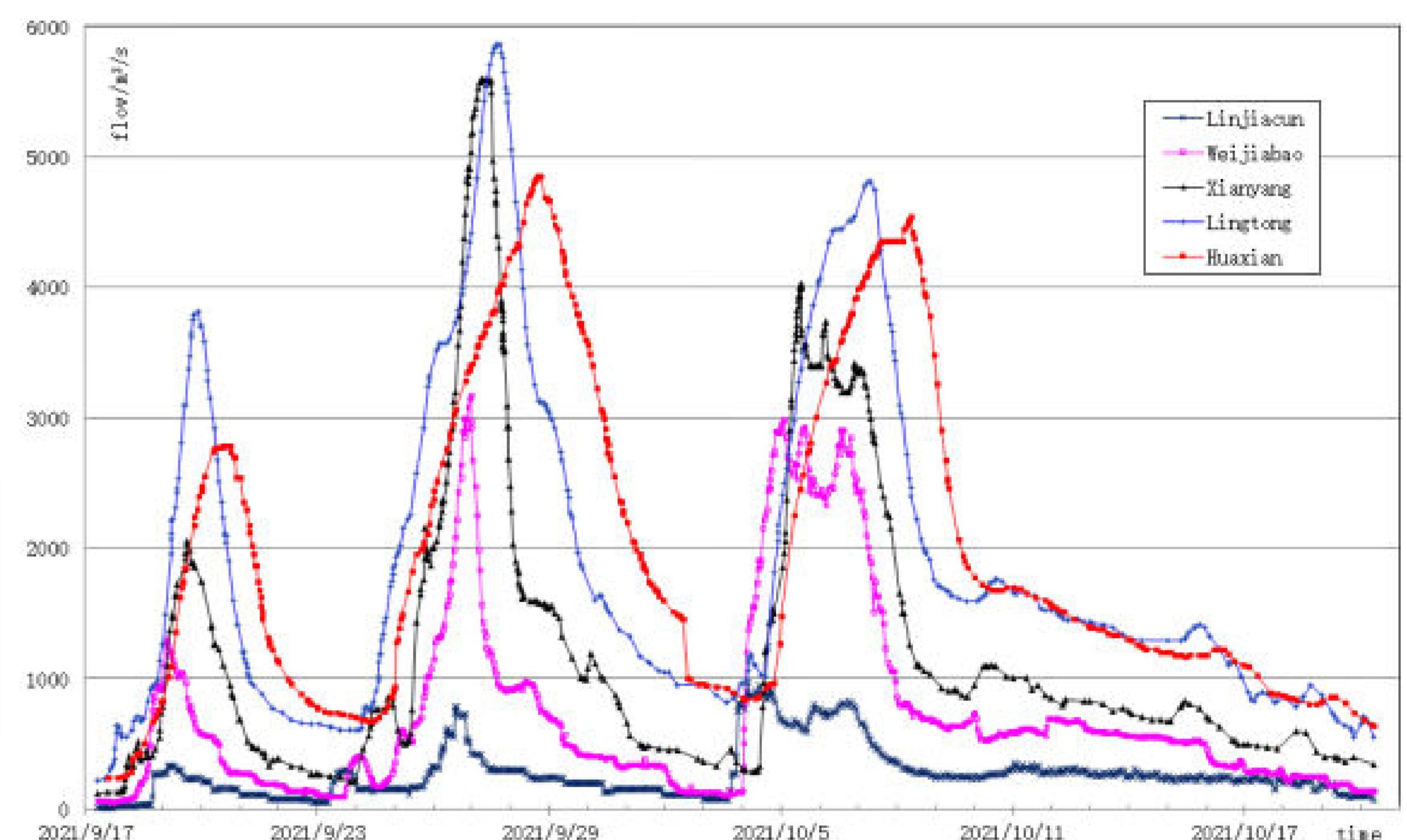


Fig.2 The "21•9" flood discharge hydrograph of the main control station in the middle and lower Weihe River

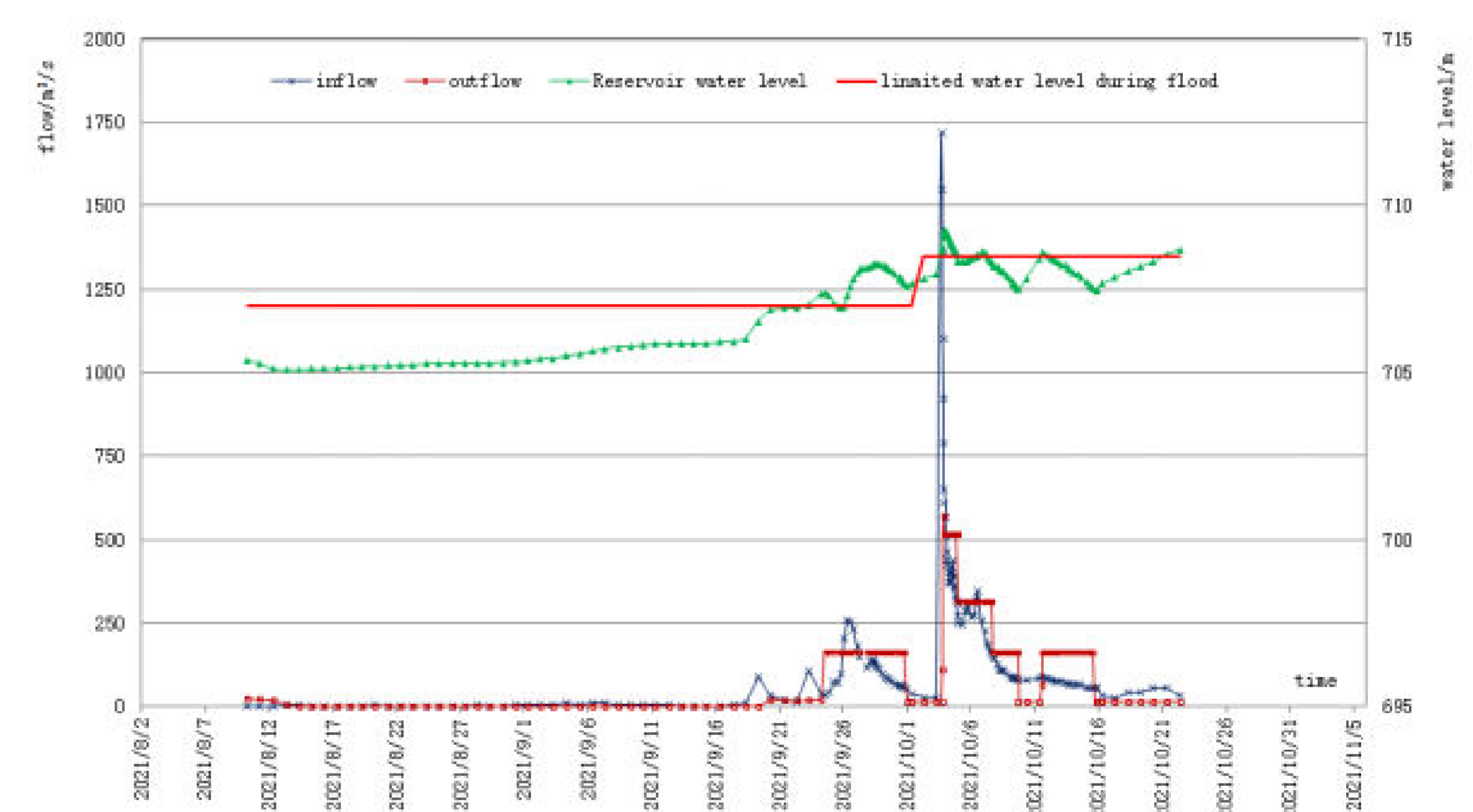


Fig.3 The "21•9" flood inflow-outflow process of Fengjiashan Reservoir

Conclusions

The experience of autumn flood prevention is concluded that the upgrading of engineering facilities is the foundation, the improvement of river flood discharge conditions is essential, enhancing fine scheduling of the "Four preprocesses" is key, quick protection is the guarantee.