

Spatial and temporal distribution characteristics of rainstorm and flood disasters in yunnan in recent 30 years.

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Objectives

In this paper, the data of 3951 rainstorms and floods in Yunnan Province from 1990 to 2020 were collected and sorted out for the first time by taking the county as the unit. The temporal and spatial variation characteristics of rainstorm and flood disasters in Yunnan are studied.

Methods

Adopt mathematical statistics method, morlet function wavelet transform and ArcGIS platform 3D perspective.

Results

In the past 30 years, the frequency of rainstorm and flood disasters in Yunnan Province has increased linearly, with less disaster years and more disaster years appearing alternately; The disaster indicators all show a linear trend of change, with a linear decrease in the affected area of farmland, collapse of houses, and death toll. The temporal characteristics of direct economic losses show a linear increase, but the proportion of direct economic losses to the province's GDP in that year shows a linear decrease. The occurrence frequency and disaster indicators have obvious periodic characteristics. The spatial distribution trend shows a highly uneven regional distribution, with obvious regional characteristics; The areas with the highest and lowest frequency of occurrence have a high degree of overlap with the areas with the heaviest and lightest disasters; The top three cities with the highest frequency of occurrence are Zhaotong City in northeastern Yunnan, Kunming City in central Yunnan, and Dali Prefecture, while the lowest top three cities are Nujiang Prefecture, Diqing Prefecture, and Lincang City in northwestern Yunnan; Among the rainstorm and flood disaster indicators, the distribution trend of prefectures and cities is that Zhaotong in the northeast of Yunnan is the highest value, and Diqing in the northwest of Yunnan is the lowest value, which shows that human activities are the important influencing factors of rainstorm and flood disasters; The disaster indicators throughout the province are the largest in Northeast Yunnan and the smallest in South Yunnan; The death toll due to disasters is highest in Northeast Yunnan and lowest in Central Yunnan.

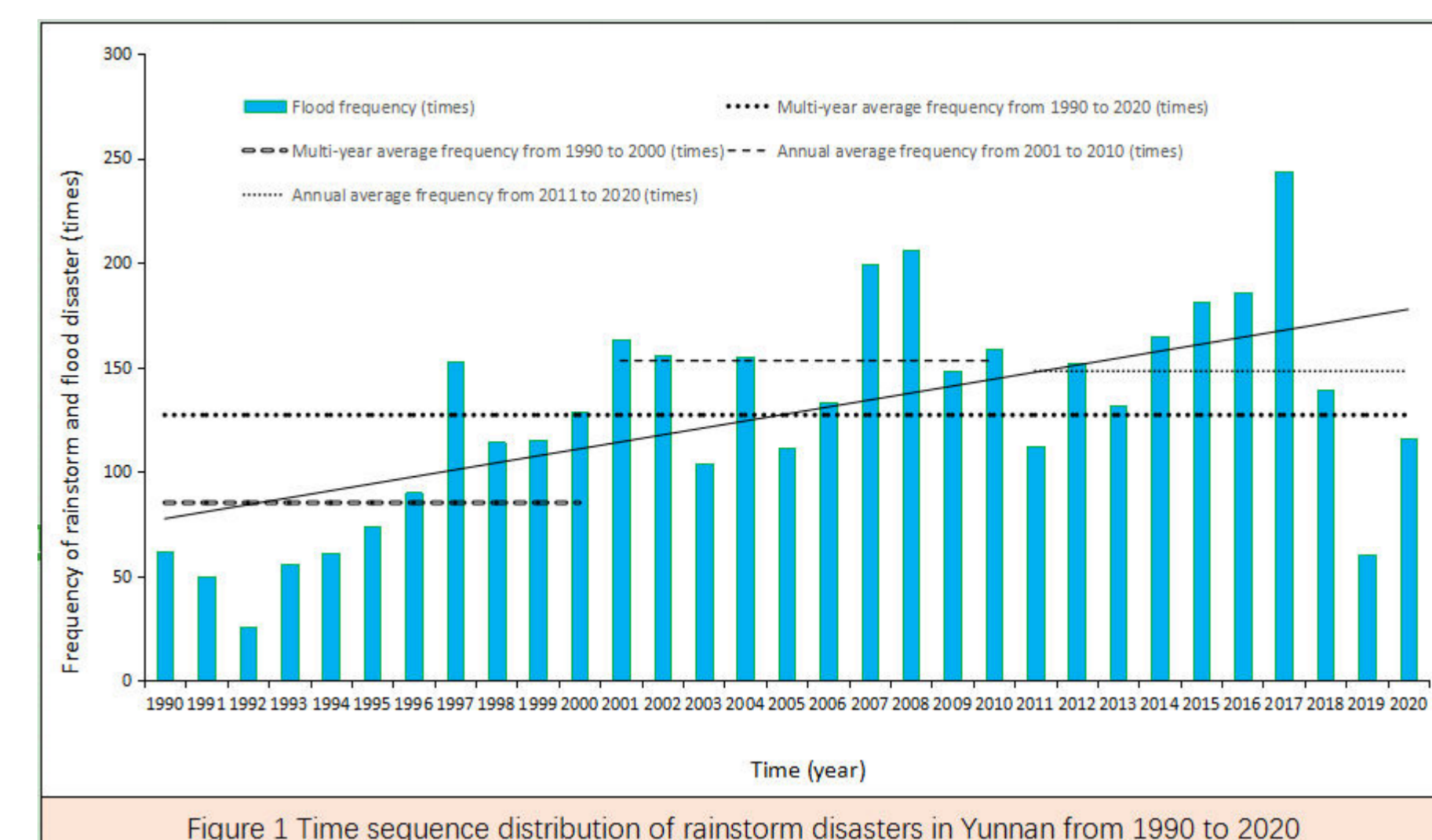


Figure 1 Time sequence distribution of rainstorm disasters in Yunnan from 1990 to 2020

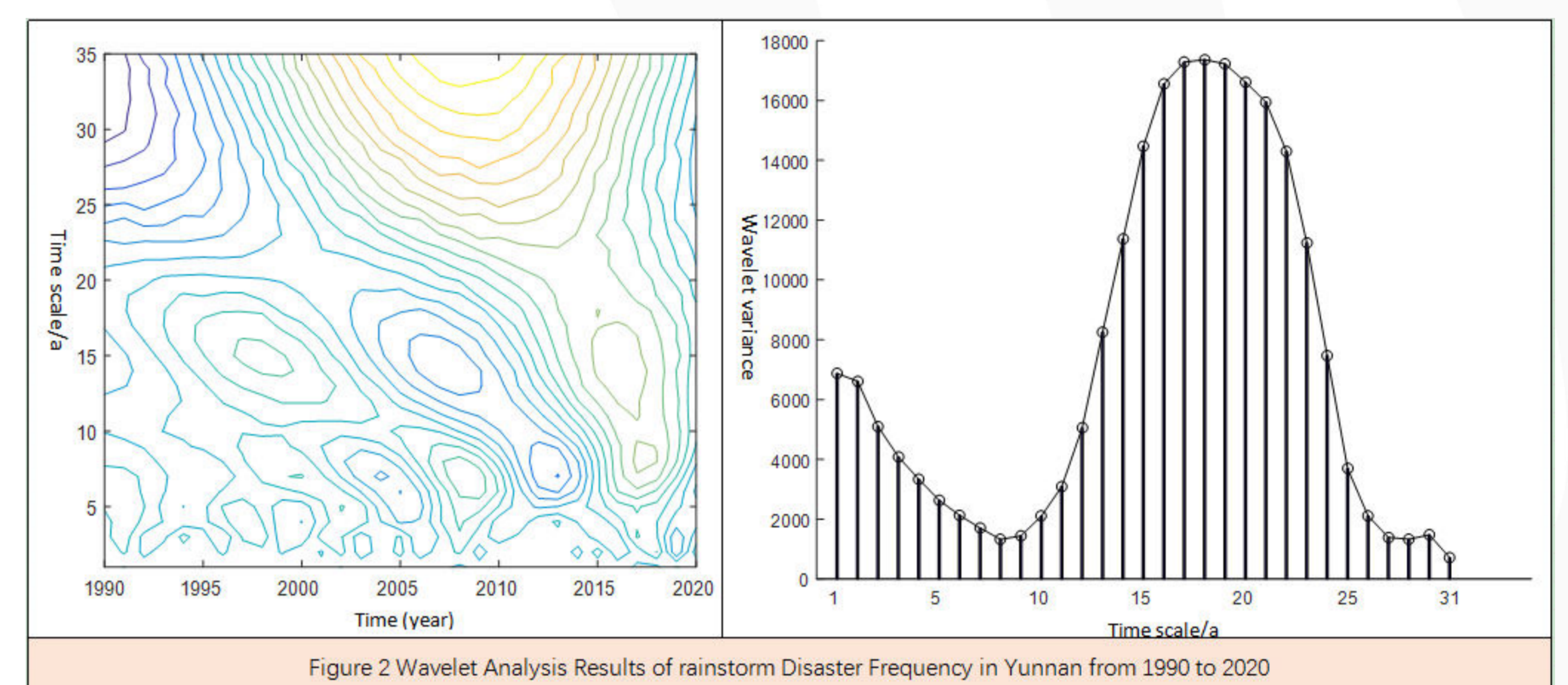


Figure 2 Wavelet Analysis Results of rainstorm Disaster Frequency in Yunnan from 1990 to 2020

Conclusions

The research results can provide support for disaster prevention and mitigation countermeasure research, rainstorm and flood disaster risk assessment and zoning.

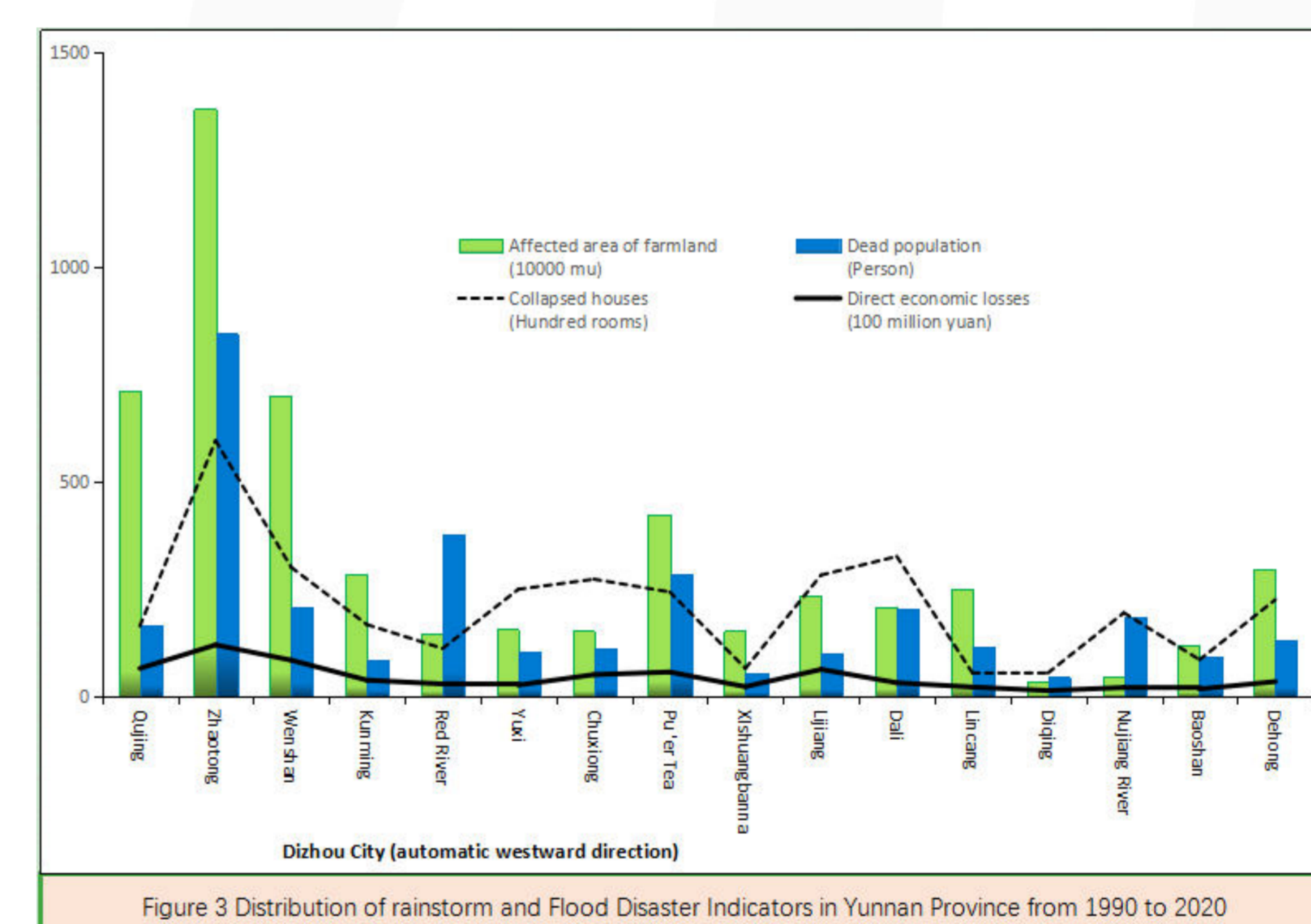


Figure 3 Distribution of rainstorm and Flood Disaster Indicators in Yunnan Province from 1990 to 2020

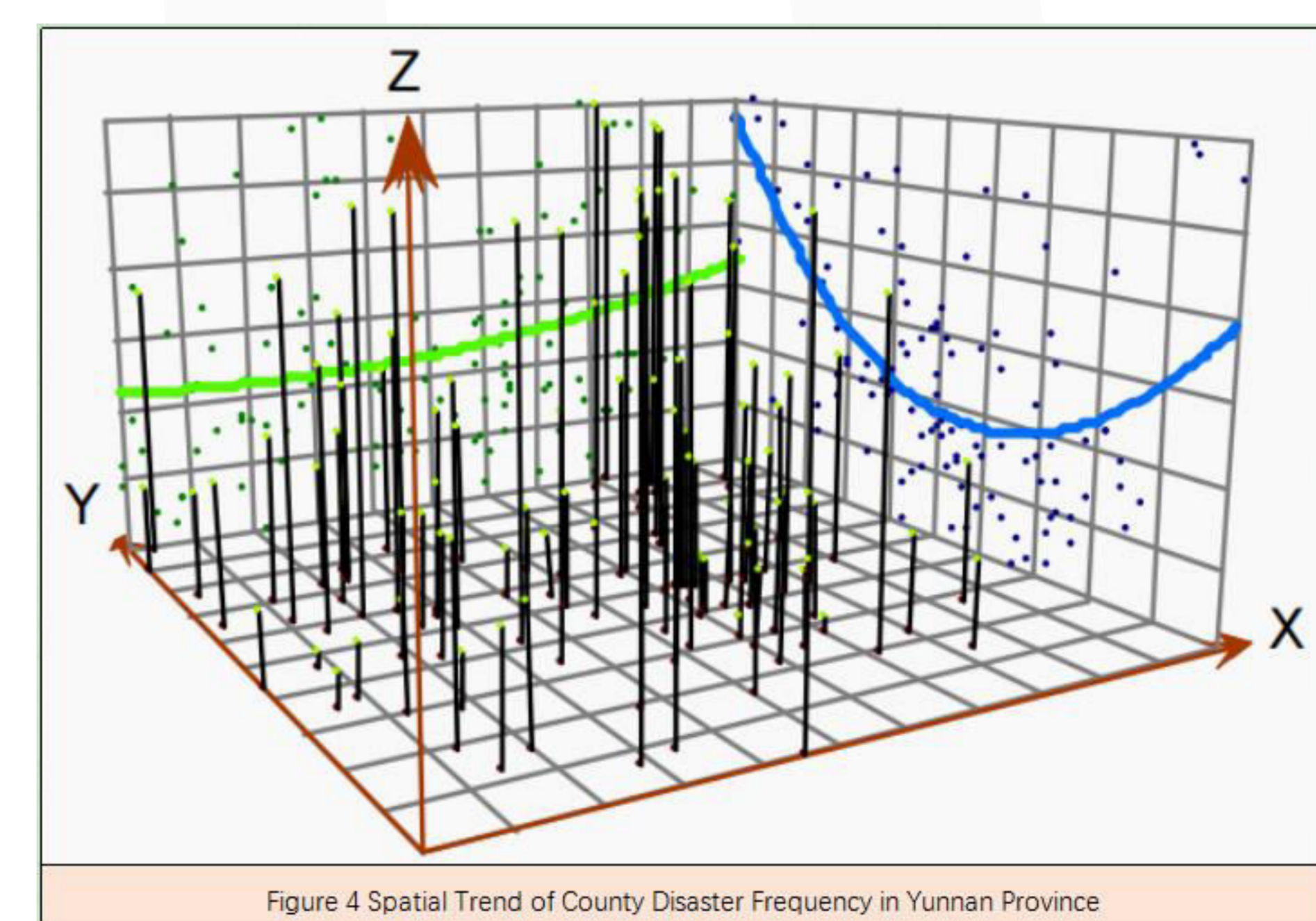


Figure 4 Spatial Trend of County Disaster Frequency in Yunnan Province