

Assessment of rainstorm climate risk and rainstorm-induced agricultural disaster risk in east-central China

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Abstract By using the 1961–2008 observation data of rainstorms from 292 meteorological stations in east-central China and the historical data on agricultural disasters, a rainstorm climatic risk index and an agricultural relative disaster index, as well as their risk assessment models, were constructed by principal component analysis, soft histogram estimation, grey correlation analysis, and normal information diffusion. Then the risk of rainstorm climate and its induced agriculture disasters in east-central China were assessed. In east-central China the rainstorm climatic risk had a decreasing trend from south to north, with high risk in Hainan and coastal areas of Guangdong and Guangxi, medium risk in north-central Guangdong and Guangxi, Anhui and Hubei within Jianghuai Region, and Jiangxi, and Hunan within Xianggan Region, and low risk area in northeast China, except its coastal areas of Liaoning and in Shanxi and Hebei of North China. High-value areas of agricultural relative disaster risk are located in Anhui, Hubei, Hunan, and Guangdong, and low-value areas are located in Hebei, Henan, and Liaoning. The correlation coefficient between the rainstorm climatic index and the agricultural relative disaster index is more than 0.6 in each province/autonomous region except Guangdong. It was shown that the rainstorm climatic risk index and the agricultural relative disaster index can be used to assess the actual rainstorm strength and the possible rainstorm-induced agriculture disaster loss, respectively.

Key words inducing factor of rainstorm disaster; rainstorm climate index; agricultural relative disaster index; risk assessment