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Exploring Spatial Drought Patterns Based on the Multivariate Hidden Markov Chain Model over Korea Peninsula

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Recent droughts in South Korea have led to large economic and environmental impacts. Changes in hydrologic patterns under climate change can potentially increase the occurrence of extreme droughts and affect the future availability of water resources. This study aims to explore the spatio-temporal characteristics of meteorological droughts using the rainfall anomalies over the past fourth decades (1973-2017) in South Korea. We developed a new approach for clustering spatial drought patterns based on the Multivariate Hidden Markov Chain Model. In general, HMM based approach is capable of capturing the spatio-temporal patterns in a systematic way. The approach proposed in this study aims to identify spatial-temporal drought patterns and further estimate regional drought risk. Several examples will be examined, and a detailed discussion will be provided.

KEYWORDS: Multivariate Hidden Markov Chain Model, Spatial drought pattern. Drought Management

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