

Spatial distribution and temporal variation of rainfall in Guangdong Province, China

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Abstract The purpose of this paper is to reveal the pattern of the spatial distribution of precipitation in Guangdong Province, China. Time series of annual precipitation from 1956 to 2000 at 186 rainfall gauges scattered throughout the whole province were used for this study. Records of rainfall of all the gauges were first characterized. Using the theory of pattern recognition in classification of spatial precipitation distribution, this paper analysed four to nine categories of rainfall features, including the annual amount and yearly mean amount. By comparison of the actual distribution of rainfall and the corresponding meteorological elements, it is concluded that the six-type classification of the spatial distribution of rainfall features is most reasonable in Guangdong Province. Furthermore, based on theories of artificial neural networks, a new type of pattern recognition model with functions for accessing and predicting mode patterns is developed. Elevation, temperature and evaporation are chosen as the model elements to predict the rainfall distribution pattern in an ungauged region. The predicted results match very well with the distribution of the measured rainfall record.

Key words pattern recognition; spatial rainfall distribution; artificial neural networks; Guangdong Province
