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Predicting Spring rainfall Based on Remote Linkage controlling using Adaptive Neural-Fuzzy Inference System (ANFIS)

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This paper aims to study the relationship between climatic large-scale synoptic patterns and rainfall in Khorasan Razavi Province. The adaptive neural-fuzzy inference system was used in this study to predict rainfall in the period between April and June in Khorasan Razavi Province. We first analyzed the relationship between average regional rainfall and the changes in synoptic patterns including sea-level pressure, sea-level pressure difference, sea-level temperature, temperature difference between sea level and 1000-mb level, the temperature of 700-mb level, the thickness between 500 and 1000-mb levels, the relative humidity of 300-mb level and precipitable water. In the selection of these regions, which include a number of locations in the Persian Gulf, the Oman Sea, the Black Sea, the Caspian, the Mediterranean, the Adriatic, the Red Sea, the Eden Gulf, the Atlantic, the Indian Ocean, and Siberia, we have examined the effect of synoptic patterns in these regions on the rainfall in the northeast region of Iran. Then, the adaptive neural-fuzzy inference system in the period 1970 -1997 has been taught. Finally, the rainfall in the period 1998-2007 has been predicted. The results show that the adaptive neural-fuzzy inference system can predict the rainfall with reasonable accuracy in 90 percent of the years