A long-term runoff forecast model based on association rules of data mining

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Abstract Association rule is an important method for data mining. There are a lot of hydrological and forecasting data in the region area of long-term runoff forecasts. It is important to fully analyse and mine these data via various intelligent algorithms to formulate hydrological forecast for a precise forecast. Considering the characteristics of hydrological forecasting, the association rule mining method is applied to the long-term runoff forecast. The hydrological and meteorological data from 1956 to 2005 were selected to constitute the Jiangqiao station runoff forecast database at Nenjiang River. According to the min-support and min-confidence, the data was pre-treated before extracting association rules by the standards to find the strong association rules. In the practical example of Jiangqiao station, three strong association rules were mined and these rules reveal the effects of the North Pacific sea surface temperature (SST) on the flood season runoff at Jiangqiao hydrological station. The qualified rate of the model is 80%, and the results show that the model is highly effective for flood prediction of Jiangqiao station in the flood season. Furthermore, the association rule mining may be used as an effective tool for the long-term hydrological forecast.

Key words association rules; data mining; sea surface temperature (SST); long-term runoff forecast