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Quantitative Analysis on Sensitive Factors of Runoff Change in Fenhe Watershed Based on Integration Approach

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Under the influence of human activities and climate changed, the runoff of the Fenhe River flowed into the Yellow River (RRY) reduced significantly, this exacerbated the situation of the shortage of water resources and led to the deterioration of ecological environment, Shanxi Province. At the same time, the decrease of RRY made the runoff of the Yellow River reduced and exacerbated the water resources shortage of the middle area of the Yellow River. Therefore, it is important to alleviate water shortages, develop the soil and water conservation measurements and regional water policy by analyzing the influence of human activities and climate changed on the RRY.
The current study quantified the amount of decrease of RRY which caused by human activities and climate changed using statistical methods and watershed hydrological model. The main results of the study were as follow:
(1) Using hydrological variation diagnosis system, the variation characteristics of long time series of measured annual runoff were analyzed in Hejin station, which is the Fenhe River control station. The results showed that the runoff of Fenhe River run into Yellow River declined year by year, in 1971, fell the most obviously.
(2) The impact of LUCC on runoff was calculated used the method of area ratio in the Fenhe River basin. Human activities was a more important factor is that caused the decrease of RRY than climate changed, contributed 83.09% of the total reduction of RRY, Groundwater exploitation gave the greatest contribution to the decrease of RRY in the scope of several kinds of human activity (30.09%), followed by coal mining (26.03%), climate changed contributed 19.17% of the total reduction of RRY, and the decrease of precipitation contributed 20.81%. But the variation of air temperature and wind speed would result in the increase of the amount of RRY.