

Research on reflowing conditions of Jinci karstic spring, north China

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Abstract Jinci karstic spring dried in 1994 due to long-term groundwater overexploitation, and the possibility of this spring reflowing became topical research in China. Artificial neural network (ANN) was used to capture the inherent nonlinearity and complexity, which is associated with the relationship between the spring flow and its influencing factors. Precipitation, Fenhe River infiltration, groundwater exploitation, coal mining drainage and lateral discharge were selected as the input variables, and water level was selected as the output variable. Both the simulation and verification errors were satisfied by error test criteria and a reasonable groundwater protection scheme was obtained by restricting the groundwater exploitation to 0.59 m³/s and coal mining drainage to 1.056 m³/s, then the Jinci karstic spring will reflow in 2015.

Key words Jinci karstic spring; artificial neural networks; reflowing