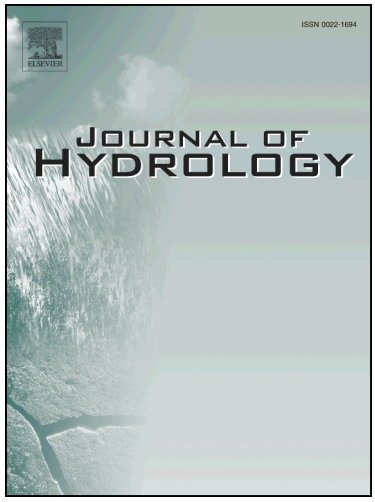

Streamflow forecast uncertainty evolution and its effect on real-time reservoir operation

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Streamflow forecast uncertainty evolution and its effect on real-time reservoir operation

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Abstract: When employing streamflow forecasting in practical applications, such as reservoir operation, one important issue is to deal with the uncertainty involved in forecasting. Traditional studies dealing with the uncertainty in streamflow forecasting have been limited in describing the evolution of forecast uncertainty. This paper proposes a copula-based uncertainty evolution (CUE) model to describe the evolution of streamflow forecast uncertainty. The generated forecast uncertainty series fits the observed series well in terms of observed mean, standard deviation and skewness. Daily flow with forecast uncertainty are simulated and used to determine the effect of forecast uncertainty on real-time reservoir operation of the Three Gorges Reservior (TGR), China. Results show that using the forecast inflow coupled with the pre-release module for reservoir operation of TGR in flood season cannot increase the flood risk.

Keywords: Streamflow forecast uncertainty; uncertainty evolution; copula function; effects of streamflow forecast uncertainty; real-time reservoir operation

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