



## **The effect of flood and climate information on low flow at the Three Gorges Region, China**

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Both the flood and low flow analysis can improve the water management and dam operation, then relieve the effects of extreme hydrological events. But previous studies ignored the relationship between them. Here, the dependence of flood and low flow at the Three Gorges Region of Yangtze River basin in China is firstly explored. The analysis of streamflow across gauges, including Cuntan, Wanxian and Yichang, demonstrates that there is no statistically significant correlation between Annual Maximum Daily Discharge (AX) and Annual Minimum 7-day Discharge (AN), while a strong correlation between volume and duration and AN that occurs in next year was found. Furthermore, we identified Arctic Oscillation (AO), Pacific Decadal Oscillation (PDO) and Snow Cover in Tibetan Plateau as the covariates, which have certain teleconnections to AN. Bayesian models including full pooling and no pooling models were then developed for the AN with the result that full pooling model with volume, compared to others, best fits the observations. Statistics such as Deviance Information Criterion (DIC) and Reduction of Error (RE), Coefficient of Efficiency (CE), coverage rate under cross validation serve as a test of good performance of the model. An analysis of contributions of each predictor illustrated the volume mostly contributes to the low flow. Recent simulations since Jun 2003, when the TGR started to retain water, were used to analyse the effect of dam operation on the low flow. The comparisons of observations and predictions during post-dam period demonstrated that, the dam effectively relieved the extreme low flow events. Our research tends towards helping the decision makers manage the reservoir using the dependence of flood and low flow under the changing climate conditions.