

## **Feature analysis and prediction of ice regime in the source region of the Yellow River**

**DU YI-HENG, HAO ZHEN-CHUN & JU QIN**

*State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering, Hohai University,  
Nanjing 210098, China*  
[flyinmoon2005k@163.com](mailto:flyinmoon2005k@163.com)

**Abstract** The Yellow River is a river where serious ice disasters frequently take place in winter. In recent years, the stable frozen period has decreased and the frequency of intermittent freeze periods has increased. After analysing the main factors influencing the ice regime, the prediction factors can be selected. Using multiple linear regression (MLR) and artificial neural network (ANN) methods, this paper sets up two models for the freeze-up and break-up date prediction. In the MLR model, stepwise regression analysis is used to select the highly-related factors into the prediction equation. In the ANN model, a multilayer preceptor in SPSS, a statistical analysis software named Statistical Product and Service Solutions, is used to set up topology between input factors and output date. In conclusion, a comparison is made between the results of the two different methods. The ANN model performs better than the MLR model.

**Key words** Yellow River; ice regime; ice forecasting; MLR; ANN