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Model Performance Evaluation for Real-Time Flood Forecasting

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ABSTRACT

Model performance evaluation for real-time flood forecasting have been conducted using various criteria. Although the coefficient of efficiency (CE) is most widely used, we demonstrate that a model achieving good model efficiency may actually be inferior to the naïve forecasting, if the flow series has a high lag-1 autocorrelation coefficient. We derived sample-dependent and AR model-dependent asymptotic relationships between the coefficient of efficiency and the coefficient of persistence (CP) which form the basis of a proposed CE-CP coupled model performance evaluation criterion. Considering the flow persistence and the model simplicity, the AR(2) model is suggested to be the benchmark model for performance evaluation of real-time flood forecasting models. We emphasize that performance evaluation of flood forecasting models using the proposed CE-CP coupled criterion should be carried out with respect to individual flood events. A single CE or CP value derived from a multi-event artifactual series by no means provides a multi-event overall evaluation and may actually disguise the real capability of the proposed model.