Risk in Water Resources Management (Proceedings of Symposium H03 held during IUGG2011 in Melbourne, Australia, July 2011) (IAHS Publ. 347, 2011). 101-106

Propagation of input errors: implications for model simulations and risk analysis

KERRIE M. TOMKINS[1] **& ANDREW J. DAVIDSON**[2]

1 *CSIRO Land and Water, Black Mountain Laboratories, PO Box 1666, Canberra, Australia Capital Territory, ACT 2601, Australia*
Kerrie.Tomkins@csiro.au

2 *New South Wales Office of Water, Government Service Centre, PO Box 189, Queanbeyan, New South Wales 2620, Australia*

Abstract Hydrological models are widely used in water resources management in Australia. Unpinning these models is streamflow data, which is commonly used as inputs, for calibration of parameters and, for verification of model performance. One of the lesser investigated issues in modelling and uncertainty analysis is how the choice of error models impacts on simulations, and how this propagates into decision-making where simulations are used to determine the volume, frequency and reliability of flows. We used an analysis of the deviations in gaugings from flow gauges in the Namoi River catchment, to derive empirically-based error models for the data. The error models were used to generate uncertainty in tributary and residual inflows in the Namoi River Integrated Quality and Quantity Model (IQQM). Several scenarios were run, including empirically-derived best-fit, empirically-derived Gaussian and standard Gaussian error models, with reference to a baseline simulation where the data are assumed to be error free. Analysis of end-of-system flows showed that there was no conclusive difference in the effect of the error models; however, this was likely to be due to the addition of random rather than auto-correlated errors, which arise from fitting of rating curves to gaugings. This study highlights the need for further investigation into rating curve uncertainty, error autocorrelation and sampling of error models.

Key words uncertainty; river model; rating curve; Namoi River