[PDF (463K)] [References] [Supplementary Materials] ×

A simulation based approach for representation of rainfall uncertainty in conceptual rainfall runoff models

[Shahadat Chowdhury](#)[1] and [Ashish Sharma](#)[1]

1) School of Civil and Environmental Engineering, The University of New South Wales

Abstract:
One of the common contributors to the uncertainty in any rainfall runoff model is the error distribution within the rainfall inputs. The uncertain rainfall introduces systematic bias in the estimated parameters. We present here the application of a method, known as simulation extrapolation (SIMEX), to ascertain the extent of parameter bias. SIMEX requires a knowledge of the standard error associated with the rainfall at any given time step. With this knowledge, it generates multiple sets of rainfall with artificially inflated error variance, and then assesses whether this leads to any trend in the resulting parameters. This trend is then extrapolated back to assess the most suitable parameter value when the input is error free. The applicability of the method is investigated using a synthetic example where rainfall uncertainty is multiplicative and temporally invariant. This paper ascertained the bias trend in three key storage parameters of the Sacramento Rainfall Runoff Model representing surface and subsurface flow mechanisms respectively. This initial investigation confirmed the stability of SIMEX for use in hydrological model specification studies; which hints the possibility of embedding this simple method to improve runoff estimation.

[PDF (463K)] [References] [Supplementary Materials] ×

Japan Science and Technology Information Aggregator, Electronic