

Weather generator application with mixed exponential distribution representing rainfall intensity

ABSTRACT

Adequate and accurate rainfall information is vital in hydrological forecasting, however historical data are sometimes inadequate or nonexistence at location of interest. Stochastic weather generator which is developed based on historical metrological data, is often employed to generate synthetic rainfall series. In this study, the Advanced Weather Generator or AWE-GEN is employed to generate hourly rainfall series in the state of Johor, Malaysia. Within the AWE-GEN, is the Neyman Scott model to assess rainfall series. This study proposed the use of Mixed Exponential distribution in representing rainfall intensity of the Neyman Scott model. AWE-GEN is developed based on meteorological data from period 1975-2015. The model is then used to generate rainfall series separately at two sites within Johor. Generated results were found to be comparable to the historical rainfall series at both sites. Although rainfall distribution at the two sites are influenced by different monsoon winds, the model is able to capture significant statistical characteristics of rainfall behavior at each site. The successful development of this model could be beneficial in addressing issues such as insufficiency of rainfall data at rainfall stations. In addition the model could be employed to generate data as input to various hydrological models.

Keyword: Stochastic model; Metrological data; Rainfall intensity; Probability distribution; Weather generator