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A STOCHASTIC MODEL FOR IDENTIFICATION OF TRENDS IN OBSERVED HYDROLOGICAL AND METEOROLOGICAL DATA DUE TO CLIMATE CHANGE IN WATERSHEDS

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ABSTRACT
The development of appropriate public policy responses to the impact of climate change on the overall ecosystem would require knowledge of future trends in the natural processes affecting the ecosystem. A stochastic model is therefore formulated for simulating trends in hydrological and meteorological variables. The choice of auto-regressive moving average models of orders p and q (that is, ARMA (p, q) models) is intended to retain any persistence in the natural processes. The model development involved three stages: model identification, parameter estimation, and diagnostic checks. It was found that an ARMA(1, 1) model was adequate for modeling the three variables of temperature, precipitation, and stream flow on a season basis in the Northeast Pond River watershed. Diagnostic checks showed that for each variable the residuals were independent and normally distributed (that is, "white noise"), indicating that the fitted models are the most parsimonious and of best statistical fit.

Reference: *Bobba, A.G., R.P. Rudra, and J.Y. Diiwu. 2006. A stochastic model for identification of trends in observed hydrological and meteorological data due to climate change in watersheds, Journal of Environmental Hydrology, Vol. 14, Paper 10.*

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