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**Amy J Ekanayake\*** (a.drew@ttu.edu), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX 79415-1042, and **Linda J.S. Allen**. *A comparison of the distributions of two stochastic models for metapopulation models.*

Approximately 25,000 playa lakes dot the Southern High Plains (SHP) of the United States. As the region's primary hydrological feature, playa lakes are crucial to the survival of SHP wildlife and migratory waterfowl. To model a SHP population, we consider playas as patches in Levins' metapopulation model and an extension of this model that includes patch destruction developed by Keymer and colleagues. To include variability in patch colonization, extinction, and destruction we formulate two stochastic models based on Levins and Keymer models: a continuous time Markov chain (CTMC) model and an Itô stochastic differential equation (SDE) model. Differential equations are derived for the moments of the distribution for both stochastic models. These equations are not closed; their solution depends on higher-order moments. We state cases for which the CTMC and SDE models have the same mean and variance for moment closure assumptions. Then we consider specific moment closure techniques based on normal and log-normal assumptions. Using these, we numerically solve for the mean, variance, skewness and kurtosis of the distributions. Additionally, many CTMC and SDE sample paths are generated from which the mean, variance, skewness and kurtosis are computed directly from the models. (Received September 09, 2008)