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Amy Veprauskas and **Tingting Tang*** (ttang2@sdsu.edu). *A stochastic discrete time population model with multiple independent environmental factors.* Preliminary report.

We develop a mathematical framework for examining the impact of multiple types of (independent) disturbances on a population. We assume that the occurrence and duration of these disturbances are independent of each other, but how these disturbances collectively impact the population is not. In particular, we allow for the combined effect of the disturbances to be greater or less than their additive effects, corresponding to synergistic or antagonistic interactions, respectively. This model uses a discrete-time Markov chain to describe the environment, with the impact of the environment on the population incorporated into the vital rates of a structured matrix model. We use this model to examine how persistence of a single or interacting species is impacted by multiple, interacting disturbance (Received September 17, 2019)