1067-92-433   **Bonni J Kealy*** (`bkealy@math.wsu.edu`), Department of Mathematics, Washington State University, Pullman, WA 99163, and **David J Wollkind**, Department of Mathematics, Washington State University, Pullman, WA 99163. *A One-Dimensional Nonlinear Stability Analysis of Vegetative Pattern Formation for an Interaction-Diffusion Plant-Surface Water Model System in an Arid Flat Environment.*

The development of spontaneous stationary vegetative patterns in an arid flat environment is investigated by means of a one-dimensional weakly nonlinear diffusive instability analysis applied to the appropriate model system for this phenomenon. In particular, that process can be modeled by a partial differential interaction-diffusion equation system for the plant biomass density and the surface water content defined on an unbounded flat spatial domain. The main results of this analysis can be represented by closed-form plots in the rate of precipitation versus the specific rate of plant density loss parameter space. From these plots, regions corresponding to bare ground, striped vegetative patterns, and homogeneous distributions of vegetation, respectively, may be identified in this parameter space. Then those theoretical predictions are compared with both relevant observational evidence involving tiger bush patterns and existing numerical simulations. (Received September 20, 2010)