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David J Wollkind* (dwollkind@wsu.edu), Department of Mathematics, Washington State University, Pullman, WA 99164-2930, and **Mitchell G Davis, Richard A Cangelosi and Bonni J Dichone.** *The Behavior of a Population Interaction-Diffusion Equation in its Subcritical Regime.*

A model interaction-diffusion equation for population density originally analyzed through terms of third-order in its supercritical parameter range is extended through terms of fifth-order to examine its behavior in its subcritical regime. It is shown that under the proper conditions the two subcritical cases behave in exactly the same manner as the two supercritical ones unlike the outcome for the truncated system. Further there also exists a region of metastability allowing for the possibility of population outbreaks. These results are then used to offer an explanation for the occurrence of isolated patches and sparse homogeneous distributions in the relevant ecological parameter range where there is subcriticality for a plant-ground water model system as opposed to periodic patterns and dense homogeneous distributions occurring in its supercritical regime. (Received February 27, 2017)