1098-35-229 **Kurt E. Anderson**, **Scott Manifold** and **Jonathan Sarhad*** (jonathan.sarhad@ucr.edu).
Reaction-diffusion-advection in stochastically generated tree graphs. Preliminary report.

A reaction-diffusion-advection equation is used to model population persistence in rivers. Persistence is given by the instability of the zero steady-state (i.e., persistence requires that a population be able to grow at low density). We use a principal eigenvalue analysis to determine stability. Previous work extended this type of analysis to compact metric trees, providing insight into how geometric features of trees affect the principal eigenvalue, and hence persistence. In the current work, we apply this model to stochastically generated metric trees in the service of comparing the robustness of various geometric features as indicators of persistence. The Dirichlet condition is used for the root boundary, while upstream boundaries and junctions are assumed to be zero flux. Our model features sectional areas, representing available habitat, assigned to graph edges. We have identified a distance, CM, related to the distribution of volume in a tree, as a promising indicator of persistence: Numerical results for stochastic trees show that CM out performs other metrics which have been considered, such as maximum (or minimum) distance from root to upstream boundary and the total volume of a tree. (Received January 26, 2014)