1116-92-185 **Kevin Long**, **Joanna A. Bieri*** (joanna_bieri@redlands.edu), **Chandani Dissanayake**, **Richard A. Erickson** and **Wayne E. Thogmartin**. *A continuous energy-based model for the migration of species in a network.* Preliminary report.

Understanding the impact of migratory habitats on the survival of species is an important part of making successful management decisions. Migration is a complicated process, and mathematical models offer a way to understand the importance of different parts of a migratory path. A continuous model for migrating species has been developed that tracks energy requirements of species along the migratory paths, allowing for full annual cycle migration. We begin by developing a network that consists of nodes and paths. At the nodes, the population is allowed to grow or decay based on logistic growth and predator-prey interactions with food stores. Along the path we use a partial differential equation to model the population density and energy of animals. When energy stores are large, the animals move along the migratory path with a range of speeds; however, the model requires the animals to stop if energy drops below a critical value. Once stopped, energy stores are replenished based on food availability along the path, and the animals resume migration only after energy levels are above the critical point. This model is intended to be general, not species specific, so that it can be applied to a wide range of species with a range of migratory patterns. (Received August 11, 2015)