Title: Time constraints, resource waves, and predator-prey interactions in a landscape context

Abstract:

The time available for predators to catch and process food has been recognized as a constraint on predator-prey interactions for decades. However, prevailing theory continues to assume that ecosystems are relatively well-mixed reactors where predator feeding rates are primarily limited by the density of prey rather than the time available for predators to elicit growth or numerical responses to fleeting opportunities for feeding. The physiology and behavior of mobile predators (from fish to bears) suggest that time constraints may be far more important than currently recognized. New perspectives on the responses of food webs to climate change and loss of landscape heterogeneity emerge by recognizing that in productive ecosystems, resources are available to consumers with spatial and temporal patterning that relax the constraints of time on predator-prey interactions. I will provide results from both simulation models and from field observations of aquatic, terrestrial, and cross-habitat predator-prey interactions to illustrate these points.