"The ecological and eco-evolutionary dynamics of aquatic metacommunities"

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Ecologists are increasingly recognizing that spatial dynamics and the movement of organisms among habitats can have major influences on the dynamics, diversity and evolution of natural communities. Thus local communities are linked together by dispersal, forming what are known as “metacommunities.” The Steiner lab is currently pursuing several projects centered on the ecology and evolution of aquatic metacommunities. Two major projects are being pursued in the summer of 2016:

1) Project title: The impact of dispersal on the rapid adaptation of zooplankton populations and community stability in systems experiencing environmental perturbations. Aquatic ecosystems continually experience natural environmental perturbations as well as impacts from human activities. We are interested in the factors that enhance the persistence and stability of communities in the face of such environmental change. In this project we are experimentally examining how dispersal of zooplankton influences the rapid evolution of a keystone zooplankton species, *Daphnia pulex*, and in turn how their evolutionary responses stabilize the larger ecosystem when these systems experience environmental perturbations. This project is field-based and will involve outdoor experiments in artificial ponds at the KBS Experimental Pond Lab Facility.

2) Project title: the relative importance of dispersal limitation and local interactions on the coexistence of invertebrate predators in fishless ponds. Historically, ecologists have viewed spatial patterns of species diversity as largely a by-product of processes that occur within local communities (e.g., competitive interactions or predator-prey interactions). More recently, ecologists have recognized that dispersal and the randomness of dispersal history can have a strong influence on the composition of communities that we see in nature. This project is focused on patterns of coexistence of invertebrate predators, the backswimming bugs Notonecta, and will examine the degree to which Notonecta composition in natural ponds is influenced by dispersal limitation versus local scale processes. This work will be field-based and will involve surveys of ponds in the KBS area as well as enclosure experiments in natural ponds.