Climate Effects on Community Interactions in Terrestrial and Aquatic Systems

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Summary: Student will have the opportunity to gain hands-on experience with field based experiments in both terrestrial and freshwater systems. Responsibilities will include assistance in field- and lab-based data collection as well as set-up of an aquatic long-term ecological experiment. Individual will be expected to have a positive attitude for the duration of the 11-week program and will be responsible for working ~20 hours/week from May 23-August 5, 2016. Field work will require the ability to work in all non-hazardous weather conditions as well as the capability to navigate tight spaces while in tall vegetation.

Research Projects:

1. Warming Effects on Invasive Species Success: Rapidly increasing warmer temperatures are predicted to favor introduced plants due to their advanced ability to adapt to new abiotic conditions. In addition, plants that are introduced into novel ecosystems often lack their native herbivores that limit their success, allowing the introduced plants to outcompete the existing native species. This experiment addresses the extent to which warming affects the success of introduced plant species under two types of naturally occurring herbivore pressure, insects and small mammals. Student will gain experience working with open top chambers (OTCs) that simulate warming in terrestrial systems as well as advanced HOBO instruments that record long-term abiotic readings. Individual will also assist in the handling and identification of plants, insects, and small mammal species.
2. Effects of climate warming on freshwater invertebrate body sizes, predator-prey dynamics, and population abundances: Climate warming is expected to shift body size distributions of freshwater invertebrate populations toward smaller body sizes. Increased temperature and shifts in body sizes that result from climate warming should influence the strength and dynamics of predator-prey interactions, and in-turn, alter equilibrium population abundances of predators and prey. We are using pond surveys and pond-mesocosm warming experiments to understand the consequences of climate warming for freshwater invertebrate body sizes and predator-prey interactions. The data from our field surveys and experiments will be used to create mathematical models that predict population abundances of freshwater invertebrates under future climate warming. The URA student will gain experience in standardized sampling of pond invertebrates, including benthic macroinvertebrates and zooplankton, and water sampling. Student will also gain experience in setting-up and monitoring pond-mesocosm experiments. Field sampling will occur at Lux Arbor Reserve, and there is a possibility for off-site sampling in northern Michigan.

Contact Information: For questions regarding this opportunity, please contact Kileigh Welshofer at browni54(at)msu.edu.