Impact of fragmentation on fitness of prairie plants

Research description: Minnesota’s prairies once covered approximately 18 million acres; now, less than 1% remains. As prairie plant populations have decreased and become fragmented, genetic diversity has declined. This may impact the capacity of prairie plant species to adapt to rapid environmental change. Increasingly, society recognizes that prairies provide valuable ecosystem services; consequently, there is growing demand for prairie restoration. However, restorations require large amounts of seed, as well as research on the local adaptation and genetic variation in prairie plant species.

The Healthy Prairies project includes three experiments addressing the questions: Which microbes are present in native prairie plants and do those microbes help plants to become locally adapted? What is the geographic scale of local adaptation in prairie plant species and do “home” populations perform better than “away” populations when grown in a common environment? Do prairie plant species contain enough genetic variation to adapt to environmental change?

The principal investigators on the project are Ruth Shaw (EEB), Georgiana May (EEB), and Don Wyse (Agronomy & Plant Genetics)

Potential UROP projects include (but are not limited to): (a) assessing how populations of a species vary with respect to germination, growth, and seed production; (b) comparing how eastern and western MN populations respond to drought at different life stages; (c) developing a timeline of peak flowering and seed-setting dates for prairie species, using existing literature; (d) assessing differences among populations in pollinator activity, as a function of species and phenology; (e) comparing the extent of genetic variation that occurs within populations versus between populations

Ideal candidates
- have a strong interest in prairies, native plants, and/or community ecology
- are organized, pay attention to detail, and stay in communication with their mentors
- work well with others but are self-motivated and able to work without direct supervision

Skills you can learn
- Plant identification
- Setting up and maintaining greenhouse and field experiments
- Data collection and basic analysis
- Collaboration and project-management skills
- How to communicate scientific findings (orally, by poster, in writing)