

EEB Graduate Student Opportunities in Research Labs Fall, 2010

Go to <http://www.cbs.umn.edu/eeb/graduateprogram/faculty/> to learn more about the research of EEB graduate faculty. Many of our faculty are looking for new students every year. Below is a list of faculty who are looking for students in specific areas with their personal statements. Funding is often available on their research projects.

Dr. Mark Bee

Research in my lab focuses on animal acoustic communication. The general questions we address are (1) how do animals encode information about themselves in acoustic signals? (2) how do animals acquire information about other conspecifics through the perception of acoustic signals? (3) how do these processes function in natural habitats and noisy social environments? and (4) how have these processes evolved? Currently, anuran amphibians represent the principal study organisms in the lab, but work with other taxa is always a possibility. I may be interested in recruiting a new student to work on projects recently funded by NSF and NIH. For more information on my research projects, visit my lab website: <http://www.tc.umn.edu/~mbee>.

Dr. Elizabeth Borer (New faculty member – Spring, 2010)

I expect to recruit 1-2 graduate students to join my lab in Fall 2010. Research in my lab is diverse, but generally focused on the ways in which nutrients and consumers (including disease) control biodiversity. I have a few ongoing experimental projects at the moment including (1) examining the drivers and impacts of a generalist grassland disease and placing this into a broader understanding of disease transmission and (2) determining the general and site-specific outcomes of fertilization and herbivory on herbaceous plant biomass and composition by manipulating these at >50 sites around the world. Although I am primarily an experimentalist, my students and I use a diversity of tools (e.g. experiments, meta-analysis, mathematical models) to answer general questions.

Dr. Jim Cotner

Research in my laboratory focuses on microbial stoichiometry particularly as it applies to aquatic systems. We are particularly interested in how microbial biomass and composition have feedbacks to regional and global carbon and phosphorus cycling. I am interested in taking on one or two more students interested in this area of research. Feel free to contact me: cotne002@umn.edu.

Dr. R. Ford Denison

Research inspired by W.D. Hamilton's ideas, often using microcosms and noncharismatic microfauna: evolution of cooperation and conflict in legume-rhizobium symbiosis (New Phytologist 2009), longevity-vs.-reproduction tradeoff as a possible explanation for hormesis etc. (PLoS One 2009), and agricultural implications of past and ongoing natural selection (Q. Rev. Biol. 2003 and forthcoming book). I hope to welcome one or possibly two new students in Fall, 2010.

Dr. Jonathan Foley

I am a faculty member of EEB and the Director of the Institute on the Environment. I anticipate

looking for graduate research assistants for my group, particularly for a new 'Global Landscapes Initiative' that aims to understand the changing patterns of land use and environmental systems across the planet. Students with strong quantitative backgrounds, interested in working on global scale problems and using computer modeling and remote sensing techniques, should feel free to contact me directly at jfoley@umn.edu."

Dr. Sarah Hobbie

I do not plan to take any new students for fall 2010.

Dr. Linda Kinkel

My research focuses on the ecology and evolutionary biology of plant-associated micro-organisms in natural and managed habitats. Of particular interest are microbial species interactions, especially those that mediate plant fitness. Our work explores the coevolutionary dynamics of antibiotic-producing soil bacteria, the global biogeography of actinomycetes, the influences of plant species and plant species diversity on soil microbial communities, the impacts of microbial pathogens on plant populations and communities, and microbial biodiversity across the Minnesota landscape. I am interested in accepting an additional student for Fall, 2010, contingent upon funding (multiple proposals currently pending).

Dr. Scott Lanyon

My lab is focused on using the comparative phylogenetic approach to study bird behavioral and morphological evolution. I am hoping to accept one or two new graduate students this year. My colleagues (Keith Barker [Univ. of Minnesota], Kevin Burns [San Diego State Univ.], John Klicka [UNLV], and Irby Lovette [Cornell Univ.]) and I will soon be submitting for publication a series of papers presenting the results of a species-level phylogenetic analysis of the nine-primaried oscines (Cardinalidae, Emberizidae, Icteridae, Parulidae, and Thraupidae). This well-resolved phylogeny contains over seven hundred currently described species and provides an unparalleled opportunity to rigorously examine broad questions in evolutionary biology.

Dr. Diane Larson

I do not plan to take any new students for fall 2010.

Dr. Georgiana May

My lab conducts research on the evolution of symbiotic interactions among plants and fungi. We are primarily interested in evolutionary mechanisms underlying multiple species effects on each other's reproductive fitness. Projects span agricultural and natural plant populations with their associated fungal species, and include the spectrum of pathogenic to mutualistic interactions. We employ genetic, molecular, ecological, and modeling approaches to answer questions. Students are encouraged to develop their own research problems and systems. I plan to take one new student in Fall 2010 to join a diverse lab of graduate and undergraduate students, postdocs, and a technician.

Dr. David Mech

I do not plan to take any new students for fall 2010.

Dr. Claudia Neuhauser

I will not be taking any students next 2010.

Dr. Karen Oberhauser

Students in my lab study many aspects of insect, particularly monarch butterfly, biology and conservation. Our work involves basic biology, particularly relationships between monarchs and natural enemies (predators, parasites and parasitoids); and anthropogenic impacts of pesticides, landuse changes, and climate change on monarchs and other pollinators. We are also involved in a variety of programs focused on engaging the broader public, particularly K-12 students and teachers, in inquiry-based science. To this end, we conduct workshops, develop educational materials, and run a large citizen science program called the Monarch Larva Monitoring Project. We are also involved in national and international conservation partnerships focused on monarch and pollinator conservation. I have funding pending for a student to work on the citizen science project, and will be taking another student in fall 2010.

Dr. Craig Packer

I am not actively seeking additional students for the Fall of 2010

Dr. Jennifer Powers

The flow of carbon from the atmosphere through terrestrial plants to the soil connects the atmosphere, biosphere and lithosphere, and ultimately affects climate, soil fertility, and a host of other properties upon which life depends. I use experimental and observational approaches to investigate terrestrial biogeochemical and ecosystem processes across local, regional, and global scales. In particular, my research focuses on understanding: i) effects of anthropogenic environmental changes including land-cover and climate change on carbon cycling processes, ii) feedbacks among soil fertility, plant processes and microbial communities, iii) how plant traits and microbial diversity affect element cycling processes, and iv) recovery of plant diversity and carbon storage in regenerating tropical dry forests. I am not currently looking for new graduate students, but I am happy to talk to interested prospective students. For more information on my research projects, visit my lab website: <http://www3.cbs.umn.edu/labs/powers/>

Dr. Peter Reich

My teaching and research focus on ecology, global change, and the sustainability of managed and unmanaged terrestrial ecosystems. My work focuses regionally on the forests and grasslands of mid-North America and globally on terrestrial ecosystems in aggregate. This includes unique experimental field studies of global change effects on grasslands and forests; synthetic analyses of global plant trait data; and the development of physiologically robust global carbon cycling models. Over the years I have been deeply involved in the search for universal rules about leaf design and related scaling of physiology from seedling to adult, from cell to ecosystem, and from stand to the globe. Current projects include the B4Warmed Experiment that is assessing the effects of experimental warming on boreal forests in northern Minnesota and the BioCON+H2O study of biodiversity, carbon dioxide, nitrogen, and water impacts on the functioning of perennial grasslands in central Minnesota. Potential graduate students are encouraged to contact me directly by email.

Dr. Michael J. Sadowsky

Research efforts in my laboratory are also directed towards the identification and examination of bacterial genes involved in the early periods of legume-microbe symbioses. We are specifically interested in studying *Rhizobium* and *Bradyrhizobium* genes which play a prominent role in host/microbe communication and recognition, soil survival, and those involved in competition among soil microbes in the root zone of *Medicago* and soybean plants.

Dr. Eric Seabloom (New faculty member – Spring, 2010)

While my interests are broad, research in my lab has primarily focused on restoration and invasions of grassland communities. I have active project in three main areas and would be interested in 1-2 students for Fall 2010:

1. Community Ecology of Disease: In collaboration with Elizabeth Borer, I am investigating a wide range of basic and applied questions about the community ecology of disease using a host-pathogen community (barley and cereal yellow dwarf viruses).

2. Invasion and restoration grasslands: I am using grassland invasion and restoration processes to test theory related to resource competition, consumer-mediation of host-pathogen interactions, and pathogen mediation of invasions.

3. Behavior- and Consumption-mediated effects of Consumers on Plant Communities: I am studying consumer and plant interaction interactions using field experiments, spatially-explicit models, meta-analyses, and a collaborative experimental field experiment replicated at > 50 sites in 10 countries.

Dr. Andrew Simons

I will not be taking any new students in 2010.

Dr. Peter Sorensen

I am interested in taking a new graduate student in 2010. My laboratory focuses on pheromonal communication and behavior in fish. we also do some applied field ecology that seeks develop new ecologically sustainable techniques to control invasive fish (carp and lamprey) using pheromones and other stimuli. Presently, I have a project which address whether and how multi-component pheromones are learned or innately recognized.

Dr. Marla Spivak

I am currently accepting students. My primary research focus is on honey bees, ranging from basic studies on mechanisms of social behaviors to applied studies on bee breeding and health. We are currently investigating the role of propolis, a complex resin that honey bees collect from some trees, as a mechanism of colony-level social immunity. Propolis is widely known for its diverse antimicrobial properties and its value as a human medicine.

Please visit our web site for more information: <http://www.extension.umn.edu/honeybees>

Dr. David Stephens

I'm interested in recruiting 1 or 2 students for fall 2010. I am an experimental behavior ecologist with two key areas of interest: Decision-making and behavioral plasticity. Both of these topics connect our group with other disciplines in behavior such as psychology, neuroscience and economics. We have a colony of 45 captive blue jays that we use for studies of feeding behavior

and decision-making. We also have an ongoing project using *Drosophila* that focuses on the evolution of learning abilities.

Dr. Robert Sterner

Research by students and others in my lab is diverse but mainly we wonder about the way that organism nutrient content shapes ecology, the field of Ecological Stoichiometry. In the recent past, my lab has hosted research on bacteria, algae, zooplankton, fish, ants, and whole ecosystems. Some fundamental biogeochemical work has focussed on two study sites, Lake Superior, and the Twin Cities Metropolitan Area, while other studies have been lab-based. Past projects have explored the genomic basis of organism response to element scarcity; asked what effects cities have on plankton and biogeochemistry in urban lakes and ponds; and examined the long-term buildup of nitrate and increasing stoichiometric imbalance in Lake Superior; and others. For Fall, 2010, there is at least one (newly funded) opening on a Lake Superior project shared with Dr. Jacques Finlay. This project seeks to understand the sources and sinks of stoichiometrically imbalanced nitrate in Lake Superior.

Dr. Geroge Weiblen

My lab studies plant and insect systematics, molecular phylogenetics, empirical population genetics, pollination ecology and coevolution. We combine experimental fieldwork in tropical and temperate ecosystems with specimen-based research and DNA sequencing to study the ecology and evolution of plant-insect interactions in New Guinea. The study of coevolution between figs, their pollinating wasps and parasites is a particular focus of research. Other interests include Cannabis genetics, phylogenetic theory, floristics, and biodiversity conservation. I am currently accepting students.

Dr. Michael Wilson

My research focuses on the behavior and ecology of chimpanzees, particularly territorial behavior, aggression and communication. I am also involved in collaborative studies of demography and disease ecology.

See also: <http://anthropology.umn.edu/people/profile.php?UID=wilso198>

Dr. Robert Zink

I will not be taking new students in 2010.