







This list is not exhaustive – indeed, far from it. There are other faculty members who will be recruiting students in the Department. Also, the listed faculty members may recruit students who have different interests to those listed. But we prepared this list just to illustrate to prospective students some of the diversity of topics on which we envision recruiting, spanning conservation, macroevolution, global change ecology, molecular genetics, biology education and systematics, among many other topics.

Exemplar Research Questions
For Graduate Students in Ecology And Evolution
 Suggested by Ecology and Evolutionary Biology Faculty
 University of Tennessee - Knoxville

Ecology			Evolution		
Conservation Biology	Plant-Soil Feedbacks	Biology Education	Behavior	Climatic adaptations	Speciation
					
<p>Conservation organizations often have a hierarchical management structure – how effectively do hierarchies allocate resources to support conservation of biodiversity and ecosystem services?</p>	<p>What is the genetic basis for plant-soil linkages and feedbacks in a changing world?</p> <p>Can phylogenetic history predict ecological traits and ecosystem services?</p>	<p>How can introductory biology curricula be structured to enhance specific student learning outcomes such as nature of science, self-efficacy, and core biology concepts?</p>	<p>What is the importance of behavior in adapting animal populations to different and changing environments?</p>	<p>How have plants evolved in response to global temperature change through time?</p> <p>How would you develop a method for inferring species boundaries despite past migration?</p>	<p>What can contemporary patterns of genetic variation within and among populations tell us about species boundaries and the process of speciation?</p>

To see more potential research questions, or to learn more about opportunities for graduate study, go to eeb.bio.utk.edu/exemplar-research-questions. Applications are due January 1, annually. Our program features numerous active research groups across all these areas of study, guaranteed graduate student support, and a high placement rate of graduates into tenure-track, government, and non-government organization positions.

Exemplars of possible research projects from potential mentors: Student researchers will have the opportunity to choose to work in the following research areas and develop a project on that topic. There are a large diversity of laboratories that can include training in a broad range of field, laboratory, and computational techniques. Below are examples of general research areas students will have access to in our faculty labs.

Dr. Paul Armsworth – Professor, Ecology & Evolutionary Biology. Students research applied questions in conservation using computer modeling and statistical analyses. Projects include examining the ecological impacts and economic cost of conservation interventions, such as establishing and managing protected areas or implementing payments for ecosystem service programs. Projects will typically involve a collaborative approach with conservation practitioners. <https://www.armsworthlab.com/>

Dr. Joe Bailey – Assoc. Professor, Ecology & Evolutionary Biology. Students research aspects of evolutionary ecology along global change gradients. Projects could include how plant-animal, plant-plant and plant-environment interactions change and evolve along climate change, invasion, and genetic gradients. <http://joebaileylab.com/>

Dr. Mike Blum - Assoc. Professor, Ecology & Evolutionary Biology. Students research the socioecology of disasters and infectious disease, coastal protection and restoration, and conservation and management of freshwater resources on oceanic islands.

Dr. Jessica Budke - Asst. Professor, Ecology & Evolutionary Biology. Students research the development, evolution, and function of plant structures. Studies focus on morphological features that are used to distinguish species taxonomically and those that are important for reproduction and fitness as well as focusing on the relationship between maternal gametophytes and their sporophyte offspring. <http://jmbudke.github.io/>

Dr. Elizabeth Derryberry - Asst. Professor, Ecology & Evolutionary Biology. Students research integrates behavioral and evolutionary ecology. A variety of methods and approaches including phylogenetic analysis, genomics, and field experiments of behavioral interactions to address the proximate and ultimate factors controlling variation in signals and signaling. <https://derryberrylab.wordpress.com/>

Dr. Nina Fefferman - Professor, Ecology & Evolutionary Biology. Students research focuses on the mathematics of epidemiology, evolutionary and behavioral ecology, and self-organizing behaviors, especially of systems described by networks. <http://feffermanlab.org/>

Dr. Ben Fitzpatrick – Professor, Ecology & Evolutionary Biology. Students research population genetics and conservation biology. <http://web.utk.edu/~bfitzpa1/>

Dr. Jim Fordyce - Professor, Ecology & Evolutionary Biology. Students research questions about the underlying processes responsible for the evolution of behavioral, ecological, physiological and morphological discontinuities in nature, and how these processes might ultimately affect reproductive isolation. <http://web.utk.edu/~jfordyce/>

Dr. Orou Gaoue - Asst. Professor, Ecology & Evolutionary Biology. Students research integrates population ecology, mathematical and statistical modeling with ethnobiology to study the drivers and consequences of plant-human interactions in a changing world and how this informs the conservation of biodiversity and sustainable use of ecosystem services. <http://volweb.utk.edu/~ogaoue/>

Dr. Xingli Giam - Asst. Professor, Ecology & Evolutionary Biology. Students research conservation ecology, global environmental change, freshwater ecosystems, community assembly, macroecology, ecological statistics, socio-ecological systems, and environmental psychology. <https://www.giamlab.com>

Dr. Mike Gilchrist - Assoc. Professor, Ecology & Evolutionary Biology. Students research questions primarily focus on functional molecular evolution using population genetics and bayesian statistics. Primary questions focus on extracting information on contribution of selection, mutation, and drift on coding sequences and developing novel phylogenetics methods for inferring protein fitness landscapes. Other questions include modeling experimental data generation, cultural evolution, and host-pathogen co-evolution. <http://www.tiem.utk.edu/~mikeg/>

Dr. Susan Kalisz – Professor and Head, Ecology & Evolutionary Biology. Students research concepts and theories relating to the evolution, ecology, and conservation of plants. In particular, topics including the conditions that favor or maintain self-pollination, pollination ecology, mating barriers among and the

biogeography of *Collinsia*, the role of enemies and mutualists on population demography, and the developmental genetics of floral symmetry and mating system <https://kaliszlab.weebly.com>

Dr. Stephanie Kivlin - Asst. Professor, Ecology & Evolutionary Biology. Students research addresses fundamental questions of microbial ecology with an overarching goal of linking these processes to large-scale ecosystem fluxes of carbon and nutrients under current and future climates <https://skivlin.wordpress.com/>

Dr. Charlie Kwit – Asst. Professor, Ecology & Evolutionary Biology and Forestry, Wildlife & Fisheries. Students research (1) the effects and ramifications of land-use and climate change, management, and disturbance on biodiversity in natural, managed, and agricultural settings, and (2) the important roles animals play in seed dispersal processes in animal-mediated seed dispersal systems. <http://www.charleskwit.com>

Dr. Brandon Matheny - Assoc. Professor, Ecology & Evolutionary Biology. Students perform research in fungal molecular systematics, biodiversity, herbarium curation, and fungal interactions with plants. <http://mathenylab.utk.edu/>

Dr. Monica Papes - Asst. Professor, Ecology & Evolutionary Biology. Students research factors that shape species' geographic distributions at diverse spatial and temporal resolutions by combining ecological niche modeling techniques with GIS and remote sensing tools. <http://monapapes.wixsite.com/biodivmatters>

Dr. Ed Schilling - Professor, Ecology & Evolutionary Biology. Students research higher plant systematics using morphological and molecular data to address synthetic questions regarding the biogeography and evolution of plant groups. <http://schillinglab.utk.edu/>

Dr. Beth Schussler, Assoc. Professor, Ecology & Evolutionary Biology. Students in the Schussler Lab typically conduct research in one of two areas: 1) How anxiety towards introductory biology classes impacts student success, and 2) How GTAs balance teaching and outreach as part of their research programs. <https://schusslerlab.utk.edu/>

Dr. Jennifer Schweitzer - Professor, Ecology & Evolutionary Biology. Students research the interactions among plants and soils along global change gradients. Students employ a range of field and lab techniques in plant, soil and microbial ecology to understand how above- and below ground interactions change with global change factors. <http://jenschweitzer.com/>

Dr. Kimberly Sheldon - Asst. Professor, Ecology & Evolutionary Biology. Students research biogeography, physiological ecology, tropical ecology, climate change, conservation biology, & natural history. <http://www.biogeographyresearch.org/>

Dr. Randy Small - Professor, Ecology & Evolutionary Biology. Students research Plant Systematics and Molecular Evolution using phylogenetic analyses of molecular data (DNA sequences) to reconstruct species relationships. <http://web.utk.edu/~rsmall/>

Dr. Joe Williams – Professor, Ecology & Evolutionary Biology. Students research flowering plant reproductive evolution to understand the evolution of traits that mediate physical interactions among up to six genetically distinct organisms (male and female gametophytes and sporophytes, embryos and endosperms) <http://williamslab.utk.edu/>