

DEPARTMENT OF GEOLOGY  
ARTS & SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: 03/01/2020

PROJECT TITLE: Paleoecology and Conservation Paleobiology

Joshua Miller  
Department of Geology  
College of Arts & Sciences  
University of Cincinnati  
Cincinnati, OH 45221  
josh.miller@uc.edu  
513-556-6704

**Project Description**

Are you interested in paleontology or conservation paleobiology (using fossil records to guide conservation and wildlife management)? Fossil and sub-fossil records offer critical baselines for understanding the biological, environmental, and human drivers of ecological change. My lab studies mammal species from the last 50,000 years. Using accumulations of bones on landscape surfaces, we also evaluate changes in modern populations (Yellowstone National Park, WY; Arctic National Wildlife Refuge, AK) over the last few centuries or longer. Our research is both specimen- and database-focused. Students in my lab are currently (1) studying differences in diet and ecology of fossil bison and horse from Yukon (Canada) and Alaska during the final periods of the Pleistocene (Ice Age), (2) studying the evolution of antlers in female caribou (the only living species in which females annually grow and shed antlers), and (3) using bones retrieved from owl pellets to conduct the first survey of small mammal species across the entire coast of the Arctic National Wildlife Refuge. Our lab is also using Strontium isotopes and GIS modeling to explore patterns of landscape use for mammoths, mastodons, and other species.

Our 2020 Wise student will have the opportunity to choose the research project that fits their interests. If you are interested in historical ecology and/or paleoecology, or how conservation biology can be informed by longer temporal perspectives – this is the lab for you. We can develop your skills and interests in specimen preparation, curation, and description, statistical modeling and scripting in R (including machine learning), taphonomy (processes impacting bones between when the animals dies and when it becomes a fossil), and/or GIS. Depending on the success of Spring reconnaissance work, you may also be able to collect and work on specimens from a new fossil site in a nearby Kentucky cave. We invite the WISE student

to aim towards presenting their work at a future meeting of the Geological Society of America or the Society of Vertebrate Paleontology.