DEPARTMENT OF GEOLOGY
ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

FOR APPLICATION YEAR: 2021

PROJECT TITLE: Paleoecology and Conservation Paleobiology

Joshua Miller
Department of Geology
College of Arts and Sciences
509 Geology-Physics Building
Cincinnati, OH 45221
josh.miller@uc.edu

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 and communities across 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 2021 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 â€“ this is the lab for you. We also have opportunities to study how bones weather and decay - which is critical for paleontology as well as forensic science and solving crimes! 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. 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.