**Department of Geology**
**COLLEGE OF ARTS & SCIENCES**

**SUMMER RESEARCH OPPORTUNITIES**
**FOR UNDERGRADUATE WOMEN**

**APPLICATION DEADLINE: March 1, 2010**

*The Department of Geology is pleased to offer the following research project for the summer of 2010. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.*

**PROJECT TITLE: Changes in the leaf characteristics of major plant species along an urban-to-wildland gradient in southwestern Ohio**

**Project Supervisors: Arnie Miller and Sarah Kolbe (Geology); Guy Cameron and Theresa Culley (Biological Sciences)**

**Contact Supervisor:**
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**Project Description**

**Summer Opportunity for WISE student in Geology/Biology**

An interdisciplinary team of faculty and graduate students from the Departments of Biological Sciences and Geology is currently investigating the effects of urbanization on the nature of plant communities along an urban-to-wildland gradient ranging from the Edge of Appalachia, 130 km east of Cincinnati, through the center of Cincinnati, and west to the Miami-Whitewater area. To date, the group has censused plant populations extensively at five localities, and has determined that the abundances and compositions of plants in forested areas vary significantly at multiple spatial scales. The group is currently investigating the extent to which these patterns relate to major by-products of urbanization (e.g., increases in temperature, habitat fragmentation, industrial pollution, and invasive species) as opposed to natural regional variations in climate, bedrock, and soil characteristics. The WISE participant will work with the team on a new facet of the project: assessment of possible changes in leaf characteristics (leaf mass per area and the density of stomata) and ecophysiology (photosynthetic rate and water use efficiency)—for major plant species in association with the urban gradient. These characteristics are known to be affected by variations in climate and environmental conditions, as well as the atmospheric concentration of $CO_2$, and can be related to plants' resource utilization strategies. The group hypothesizes that the extent of the increase in $CO_2$ from rural areas towards the center of Cincinnati, along with changes in local climate and environment related to urbanization, are sufficient to effect a change in the nature of leaf characteristics and ecophysiology. The WISE participant will be involved in all facets of the project, including collection of leaves from study sites out in the field, the lab-based measurement of leaf characteristics, field-based measurements of ecophysiology, and statistical analyses of these measurements.