

**Department of Biological Sciences
COLLEGE OF ARTS and SCIENCES**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2012

The Department of Biological Sciences is pleased to offer the following research project for the summer of 2012. 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: Ancient Maya Agroforestry Systems at Tikal, Guatemala

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Project Description

The land management strategies that supported the development of complex societies in southern Mesoamerica are poorly understood. Paleoecologist David Lentz is working to provide a comprehensive, but nuanced, view of human-environmental interactions from the Maya past through research at the ancient city of Tikal. The primary theoretical question to be addressed in this study focuses on the lingering concern of how the ancient Maya in the northern Petén were able to sustain large populations during the Classic period in the midst of a tropical rainforest environment. A corollary to this question asks how agricultural intensification was achieved and how other essential resources, such as water and forest products, were managed especially in light of climatic variables. Their agroforestry activities were essential components of an initially sustainable land use strategy that eventually failed to meet the demands of an escalating population. This spiraling disconnect with sound ecological principles undoubtedly contributed to the Maya "collapse." Testing these hypotheses will provide insights that will broaden our understanding of the rise of social complexity, the expansion of the Maya political economy specifically and, in general terms, the trajectory of cultural evolution. On a broader theoretical level, the proposed study of Tikal contributes to a refined model of human-environmental interactions in ancient Maya societies with a particular focus on how these interactions were modified in response to climatic changes. These findings will, in turn, contribute to a greater understanding of the resiliency of complex societies over broad time scales. Research for this study involves the investigation of ancient seeds and wood remains and isotopic analyses of sediments recently collected from the site.