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Biology Research Internship  
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Summer 2013

## **Research Internship Full Report: Cave Biodiversity of the Ridge and Valley**

I completed my internship with The University of the South's Biology Department. My internship funded the research of cave biodiversity in the ridge and valley of Tennessee. Tennessee is home to a vast number of caves known to possess the richest cave biodiversity in the United States. The heart of Tennessee's caves are found in the South Cumberland area, including Franklin County, Grundy County, Marion County, and Hamilton County, as well as expanding into northeast Alabama and northwest Georgia. Until this summer, a great number of caves in Marion and Hamilton County had not been biologically surveyed, and their species composition was largely based on speculation, and often unknown.

Dr. Kirk Zigler specializes in cave biology research and has advised my project since its inception in January 2013. During the Spring 2013 semester, I began my project to survey cave obligate fauna of the ridge and valley. I visited several caves and collected invertebrates to be sorted in the lab. This summer, Dr. Zigler and I caved multiple times per week; ultimately extensively surveying twelve caves in the South Cumberland area. I collected over 200 samples of invertebrate biodiversity and learned to meticulously sort them in the lab. After completing the sorting process near the end of my internship period, I began the

next step of identification. This involves carefully analyzing invertebrate morphology under the microscope to find subtle differences that are used to differentiate closely related species. During this step, Dr. Zigler and I were ecstatic to find that an aquatic cave dwelling invertebrate that we collected was presumed to be extinct, had not been recorded in over fifty years, and was not known from the cave we collected it from. In addition to that find, we have a handful of millipedes that we presume to be undescribed members of the *Pseudotremia* genus. I am continuing my research project this semester for credit hours in order to complete the identification process and write a thesis paper to ideally be published.

Over the summer, I gained great experience in field biology research. While no day was exactly the same as the next, a typical day in the field would consist of waking up at 6:30 in order to leave Sewanee and meet Dr. Zigler in Chattanooga at 9:00 am Eastern time. I would drive the Sewanee Biology pickup truck loaded with boots, helmets, handlines, headlamps, and a variety of tools and supplies. Days in the lab were spent with my eyes to the microscope, sorting my specimen into individual vials.

I spent the summer of 2012 working a different University-sponsored internship in Nashville, TN, with the Land Trust for Tennessee. At that time, my planned major was Environmental Policy, and I was exploring the field of conservation easements, assessing biodiversity values, and the general field of environmental law. Working for the Land Trust taught me valuable skills that I have been able to use working in the Biology Department this summer, such as

using Geographic Information Systems (GIS) software, using handheld GPS devices, and working in a professional environment. It was satisfying to learn those skills and apply them to a different field this summer. However, after working for the Land Trust for eight weeks, I decided that I wanted to change my major to Ecology and Biodiversity to focus myself more on the biology side of environmental science. This summer further solidified that choice and directed my career aspirations towards the realm of Biology research, specifically in ecology and biodiversity field studies. I look forward to continuing my projects with Dr. Zigler throughout my senior year, and can't wait to write my thesis, and have the opportunity to be published. After this summer, I am set on ultimately attending graduate school for a master's degree or ideally a PhD in a subfield of biology.

Overall, conducting independent research with a professor has opened a whole new world of undergraduate education to me that not enough students take advantage of. Research is especially unique at a small school like Sewanee, where personal relationships with professors can be developed. My next step will be research of a different kind, as I investigate graduate studies programs around the country where I would like to continue to my education. I am not sure exactly what kind of career I will take on down the road, be it conducting biology research, teaching biology, or even working for a conservation group like the Land Trust, but I am growing more confident in my professional skills each year.