

Undergraduate Research: When I enrolled at the University of Pittsburgh, I already had most of my university requirements fulfilled from my first undergraduate degree in English at the State University of New York at Buffalo. That meant that I was able to complete my degree requirements for my B.S. in Ecology and Evolutionary Biology in the short period of two years and the connecting summer. During these two years at the University of Pittsburgh, I immersed myself in research.

The research project most closely related to the goal of my graduate studies was conducted in conjunction with my senior seminar course on global and atmospheric change which I took in the spring of 2008. For my senior thesis project, I wrote an extensive review paper on the effects of global climate change (aka global warming) on the physical forcings and ecology of marine upwelling ecosystems. Primarily, my paper addressed the mechanisms of upwelling ecosystems and how climate change may affect these mechanisms. I also examined the influences of climate change on marine primary production in upwelling systems and its subsequent effects on higher trophic-level organisms. It was during my work on this review that I realized how much research remains to be done on the effects of climate change on marine ecosystems and synthesizing this research into management and conservation plans. My original goal was to submit this review for publication which I still hope to do. However, that will require further training outside the University of Pittsburgh, because Pittsburgh lacks a program in marine sciences and, thus, the necessary expertise and collaborators were not at hand. Nevertheless, the research I conducted for this paper has proved to be a significant jumping-off point for becoming familiar with the current research in the field of marine ecology. In particular, it has guided my investigation of which statistical and field methods I would use to conduct graduate research on the effects of climate change on the distribution and trophic interactions of marine mammals.

In the summer of 2007, I worked in collaboration with Dr. Walter Carson from the University of Pittsburgh and his doctoral student, Steve Hovick, at the Pymatuning Laboratory of Ecology. The main focus of this research was to assist Steve with his dissertation research concerning interspecific competition between native broadleaf cattail and an invasive wetland plant species (purple loosestrife) and the effects of insect herbivory and nutrient enrichment upon their competitive interactions. During the field season, I supervised several undergraduate field assistants regarding this large experiment. The experimental set-up involved maintaining large-scale wetland mesocosms for long hours in inclement weather. As part of this work, I collaborated closely with Walt and Steve in designing and implementing an independent research project. My independent project investigated the role of insect herbivory on the plant architecture of purple loosestrife and sought to determine whether increased complexity in plant architecture creates a refuge effect for insect herbivores. In the course of this research, I developed a novel method for quantifying purple loosestrife plant architecture and manipulated purple loosestrife canopy structure as part of a split-plot experimental design. I also collected plant herbivory data using digital photography which will be analyzed to determine the change in herbivore activity over the course of the experiment. Steve and I are currently preparing a manuscript for publication. The research that I conducted gave me a great experience in teamwork and scientific collaboration, from working to complete a labor-intensive plant biomass survey to finishing end-of-the-season data collection in the rain in 40°F temperatures. My experience taught me much about modern experimental methods and, clearly, what I learned can be applied to marine systems.

My collaboration with Dr. Carson did not end with my summer field research. In the spring semester of 2008, I began an independent study project with him to prepare a manuscript for publication on white-tail deer over-browsing and overpopulation in the Allegheny National Forest. The data for this

manuscript was collected from a 40-year-old deer exclusion site and an adjacent “control” plot open to deer herbivory. I conducted extensive statistical analyses on species diversity and evenness indices. This is the oldest deer exclusion site in North America and will show how over-browsing caused a catastrophic collapse in understory biodiversity. Also, I conducted an extensive literature search on the effects of deer herbivory on forest understory structure and impacts upon forest management and conservation plans. It is through my work on this project that I have seen the critical importance of conducting research which can be directly applied to improving existing policy on ecosystem management and conservation. This paper will be submitted for publication by the end of this year.

In addition to these projects, I also was awarded two Richard T. Hartman Scholarships to study at Pymatuning Lab of Ecology, where I took three field courses, General Ecology, Behavioral Ecology, and Vertebrate Ecology (Mammology), during the summer of 2007. These field courses taught me valuable research techniques, such as radio telemetry, focal animal observational studies, and small mammal trapping and identification, which I will be able to apply directly to my proposed graduate research. I also worked as a part-time research assistant at the Carnegie Museum of Natural History in the Section of Mollusks. I assisted the Section Curator, Dr. Timothy Pierce with his Pennsylvania land snail distribution study, as well as sorting and identifying snail species and organizing specimens within the museum collection. I also independently investigated how an endangered snail species, the cherrystone drop snail, would be affected by the proposed construction of the Mon-Fayette Expressway through its habitat.

The common link in all my research experiences is conducting scientific studies that can be utilized in the protection, conservation, and management of endangered or threatened ecosystems and species. I believe very strongly that scientific knowledge in isolation has few benefits. It is only through the application of science through educating the public and influencing policy-makers that positive change can be accomplished. It is here that my English degree from SUNY Buffalo will be particularly useful.

Post-Undergraduate Research: I have been awarded a Gilbert Scholarship for a Sarasota Dolphin Research Internship at Mote Marine Laboratory from January to April 2009. This is the longest-running research program conducted on free-ranging bottlenose dolphins in the world. Specifically, I will be assisting in studies on dolphin population dynamics, dolphin predator-prey interactions, and sea bird ecology. I will be trained in marine mammal survey techniques, such as photo-identification, focal animal behavioral observation, acoustic detection, radio tagging, and GPS tracking. In addition, I will learn techniques in purse seining, hydrophone recording, environmental data collection, and sea-bird surveying. This internship not only will give me direct experience in marine research, but it will be research based on Mote Marine Lab’s strong commitment to conservation of marine environments and species.