

**Previous Experience-** My interests in evolutionary processes and underlying mechanics of molecular evolution have led me to pursue a number of research opportunities ranging from field work involving ecosystem function, toxicology, and genetics, to very intensive lab experiences. I have also sought out opportunities to work in education, academia, and private industry. Through these experiences I have gained a broad perspective that I have used to narrow my focus, and acquire the skills needed to accomplish my career goals.

**Undergraduate Research at TU:** I assisted in the project development and field work for a PhD student, conducting extensive field surveys in Louisiana. My interests were in plant-herbivore interactions and the impacts of genotypic variation on intraspecific (volatile chemical) communication in a natural monoculture such as a salt marsh. Using models from the literature, as well techniques learned from similar labs, we developed methods for volatile chemical collection in both a greenhouse and field environment. To make our research applicable, we collaborated with agricultural centers to include genotypes used in marsh restoration. During this project I learned to collect and identify herbivores, build enclosures, assess herbivory cues, and design equipment for volatile chemical collection. This experience taught me the intricacies involved in developing novel techniques for analyses in a non-model system. I was able to use this skill adapting many protocols to species' of interest in the molecular lab, and broadly apply this approach when designing experiments for non-model systems.

**Combined Degree Research at TU:** As my interests in the interaction of genetics and ecology developed, I looked for opportunities in which I could gain more experience in molecular evolution and genetics. I joined the lab of Dr. Michael J. Blum and began a project researching the population genetics of the marsh grass *Spartina patens*. I worked with microsatellite and chloroplast sequences to infer histories and species interactions over large landscapes, becoming skilled in DNA extraction, amplification, sequencing, and statistical analyses. More importantly, I learned that even the most carefully designed experiments fail, and that an extraordinary amount of patience is required to succeed. To surmount experimental failures I developed alternative hypotheses, tested them, and made inferences based on exclusion. The insights gained through this process allowed me to modify molecular and analytical methods for this system. Through this project I realized the value of gaining expert understanding of a system, but more importantly, I gained an appreciation for the joy of surmounting experimental failure through the scientific process.

As a result of becoming well versed in a variety of genetic techniques, I was invited to work on a project with Dr Evon Hekkala examining the phylogenetics of a species of frog presumed to be extinct. This project involved the adaptation of several molecular techniques for the extraction and amplification of poor quality museum specimen DNA. The result of this project was not only a co-authored publication in *Conservation Genetics*, but relisting of the species through teamwork with state planners and government agencies, as well as making it the target for repopulation at a newly established preserve. During this project I learned the theoretical basis of genetic evolution as well as how to apply these concepts to a variety of diverse systems in order to expand the relevance of my work beyond a single system. I also learned the power of collaborative teamwork and communication of science to non-academic venues in affecting real-world issues.

**Research Associate at TU:** As a result of the significant work I had accomplished, I was offered the opportunity to start a PhD program at TU. However, I felt I needed broader experience, so I instead accepted a position as a research associate in the lab of Dr. Corinne Richards-Zawacki. It was my responsibility to survey and infer the genetic status of Louisiana salt marsh reptiles, and

develop a method to assess chemical impacts from the 2010 oil spill. In this project I developed hypotheses, purchased and built equipment, budgeted funds, performed molecular analysis, developed a functional outreach program in the local community, and adapted methods to assess oil in blood plasma. I wrote and submitted the final research paper, currently in review for *The Journal of Herpetology*, and presented a co-authored poster at two regional conferences, giving a talk at a third. Through this experience I gained the skills to manage a large scale research project, and gained confidence in my ability to direct research from start to finish.

**Field Technician at TU:** I accepted a position as a full time field technician at TU, examining toxicology and migration ecology of multiple species of shorebirds in Southern Louisiana after the 2010 oil spill. My position involved aiding in the development of capture techniques as well as development of analyses for oil contaminants in plasma. Trapping was often extremely difficult and frustrating, however, my supervisor and I worked as a team to manage both our trapping strategies, as well as our morale, which together were the determining factors in our success. This project in particular taught me the value of perseverance and supportive teamwork in research that can often be challenging, frustrating, and tedious. Additionally, during this project I engaged in communication with reporters and journalists reporting on science, through which I further developed the skill of communicating science to a non-scientific audience.

**Industry Experience:** I accepted a position as an aquatic toxicologist at a private environmental testing lab, and later a position working for a large company that developed genetically engineered crop plants. In these positions I was responsible for data mining, daily testing, data collection, and interpretation of results. Although I learned many important skills, I realized that what truly drove my interests are broad questions that are at the intersection of basic and applied science. I realized that academia was the place in which I could best answer relevant questions, while also communicating this information beyond academia to inform decisions that directly affect environmental quality and public health.

**Broader Impacts-** I first learned the art of communication volunteering from age 13-19 at a program called STRIDES teaching horseback riding to disabled children and adults. The unique experience of watching these individuals grow and change in response to my lessons taught me the importance of being able to mold teaching styles to diverse audiences in order to affect change, and gave me a passion for teaching that has become an integral part of my professional philosophy. Since then I have sought work in wildlife education teaching classes at elementary and middle schools and developing interesting and challenging class material for a variety of audiences, from underserved urban schools to private religious schools, and everything in between. I have sought other opportunities to contribute to science education such as guest lecturing at the International School of Louisiana. I currently have plans underway coordinating more science outreach programs at local underserved schools in Minneapolis, and have volunteered to be a guest judge at two local elementary school science fairs.

**Visiting Instructor TU:** In addition to my teaching responsibilities I served as a mentor to undergraduate fellows in teaching assistant positions and involved undergraduates in current field and lab research. I created a volunteer program for undergraduates to participate in field and lab research in southern Louisiana, and personally mentored more than ten undergraduates, many of which have gone on to pursue careers in science. Because I have had the privilege of working with strong female role models in science who have greatly influenced my success, I have made significant effort to encourage young women in science by serving as a role model myself. Consequently I am proud to have recruited a field team of primarily young women, in a discipline that is typically male dominated.