

## Husky Compact Reflection: Seek and Apply Knowledge

Alex Maile

In connection with the project “Body Shape Changes Across Habitat Transitions in Lizardfishes (*Aulopiformes*)

Faculty Advisor: Matthew Davis

The project I intend to present orally and through a poster at the Husky Showcase is on “Body Shape Changes Across Habitat Transitions in Lizardfishes (*Aulopiformes*). Through the entirety of this project I know I have accomplished several dimensions when it comes to our Husky Compact including, seeking and applying knowledge, thinking creatively and critically, acting with personal and civic responsibility. My project, in a summarized format, is a morphometric study in which around 400 specimens from various museums from around the country of deep-sea lizardfishes were digitized, data logged, assigned landmark coordinates, and analyzed. This is my firsthand experience when it comes to research, as I have been working on this since the summer of 2018. Knowing this I will explain how this project has accomplished the dimensions listed above.

Ever since sixth grade I have always loved fish. Not just fishing mind you but raising extremely difficult marine fishes. I still do this today, as my laptop is illuminated by my 200-gallon reef display with fishes I have raised from fingerlings. I did everything I could to research fish species, anatomy, and research that I could access. It is this knowledge that I wanted to learn for the sake of learning, that I can now apply to my current research and research soon to follow. Never in high school or even in some of my classes at SCSU was I able to apply my fish knowledge to something productive. Sure, I could explain to my friends the venomous spines of *Siganus* rabbitfishes, but that’s all I thought it was good for. Through my research I have been able to apply this knowledge of fish anatomy and fish behavior to my project. Behaviors of these fishes show distinct correlations in my study as I will explain at the showcase. It has even pushed me to learn even more, even exploring new science fields such as fluorescence in fishes, a newly discovered phenomenon that has very little scientific work done accompanying it. This research opportunity has given me the drive to explore new ideas, formulate my own hypothesis at an academic level, and pushed me to pursue a career as an ichthyologist.

Arriving at SCSU, I found my way to Dr. Davis and asked for a research opportunity, and it is exactly that in which he provided. I was given instructions on how to perform the entire study, wasn’t micromanaged, and knew it was expected of me to accomplish this study. It was through this that I learned to work creatively and critically. The project required various procedures all of which I had to break down to their core and modify to fit my needs. One procedure called for going through 40,000 lines of code through a text file and individually modifying them uniquely by hand. Instead I organized the code in groups 10, to accommodate their protocols, and placed them in Excel, where modifications could be done in minutes, rather than days of work. The data at the end had to be analyzed several times. I polished my final data maybe 15 times, analyzing, picking out each of the 400 points, and reviewing the data repeatedly to make it better than the last.

Finally, I believe it is my job, along with anyone doing scientific research is act with personal and civic responsibility. You might be thinking, “You just work with fish what personal and civic responsibility do you even need?” It is through research like mine that provides humanity with a greater understanding of our universe. Do you think the scientists who initially studied the fluorescence in jellyfishes knew that

it would have profound effects in the medical industry to targeting cancer? It is my responsibility as a student researcher to produce the most accurate and precise data I possibly can without emotional influence to present the world with facts and this is without a doubt the responsibility of any scientist working on anything. What we are researching could change the world, and we will never know if it does unless we step up, do the work, analyze it, and exploring the capabilities of what the work has to offer not just humanity, but the world.

Through my research experience I have come to learn the importance of any discipline. In high school I thought artists were jokes to society, but here I am drawing various *Aulopiform* family representatives to be included in my scientific paper which I will try to get published. Artistic skills are not the only skills I have learned to incorporate into my research. My mathematical skills, my organization skills, my computer skills, my fish knowledge, etc., have all contributed to this research project, something of which I did not expect when starting my research. This past summer I was given the opportunity provided by Matthew P. Davis to attend JMIH (Joint Meeting of Ichthyologists and Herpetologists). It was there that I truly got an insight into the world of science. This meeting mind you is a joint meeting provided through ASIH (American Society of Ichthyologists and Herpetologists) a scientific society representing scientists of these fields, of which I am now a part of. This conference provided me with endless scientific talks, posters, and scientific personal. This conference provided me an insight into how science is performed, not just in a classroom, but by actual PhD-holding scientists working with fish. Through this I have met phenomenal people, some of which I call my new friends, and have supported me throughout my research providing critiques, advice, and new approaches to what I am doing. This work is the accommodation of hard work, knowledge and skill, communication with other scientists, and perseverance. Without my drive to become an ichthyologist, my advisor, and the resources provided to me by St. Cloud State, I honestly don't know what I would be doing.