**PERSONONAL, BACKGROUND, and FUTURE GOALS STATEMENT**

Growing up in a small beach town along the Gulf coast has no doubt shaped me into the person I have become today. From an early age I spent countless days exploring the bays and estuaries of Texas via the pursuit of hunting and fishing. It was through those experiences that my passion for coastal ecosystems began to grow and take hold. This exposure, driven inherently by my love for the outdoors drove me not only to deepen my knowledge of biology in academia but also to actively contribute to the preservation and health of local ecosystems through the practice of scientific inquiry, a goal I am proud to say that I have accomplished at Texas A&M University - Corpus Christi (TAMUCC).

Immediately upon attending TAMUCC I began reaching out and inquiring to a multitude of professors with the hope that one of them would have an opportunity for me to conduct research. To my luck, the two professors I asked, Dr. Simon Geist and Dr. Christopher Bird, welcomed me into his lab with open arms. Dr. Geist’s lab, and the subsequent project I helped his graduate student with by the name of Olivia Robson involved assessing the vertical distribution of planktonic larvae in the Port Aransas Inlet system. In particular, my role with Olivia centered around processing all of the samples she collected via boat tow, by individually removed and taxonomically identifying all zooplankton within each sample down to a genus and species using a compound light microscope. Unfortunately, at the end of my second semester in his lab, Dr. Geist returned to Germany to pursue a career in private-sector hatchery science consulting. By that time, however, I had completed all of my work with Oliva, which ultimately contributed to her M.S. dissertation and a subsequent published article for which I was not a co-author.

While working in Dr. Geist’s lab, I was also heavily involved in Dr. Bird’s Genomics Core-Lab, where I executed a range of molecular biology protocols to support internal and international research projects. My responsibilities included performing Sanger sequencing, PCR, gel electrophoresis, fragment analysis, bead cleanups, and fluorescence-based DNA quantification. Through these initial opportunities, and especially while working alongside Dr. Geist, I learned how to effectively prioritize tasks, maintain focus under pressure, and adapt to different research environments. Those initial exposures to academia/research not only strengthened my technical foundation but also taught me the importance of discipline, collaboration, and persistence in pursing long-term scientific goals.

During my time with Dr. Geist, I attended a seminar at the Harte Research Institute featuring Dr. Keisha Bahr, who presented her work titled “Coral Reefs in a Modern World: Assessing Impacts and Finding Solutions.” In her talk, Dr. Bahr discussed how her research evaluated coral health using a color card developed in her lab, focusing on the dominant coral species of Hawaii. At that point in my academic journey, I already knew I had a passion for marine biology, but her presentation profoundly expanded my perspective. I was captivated by the complexity, resilience, and beauty of coral reef ecosystems, and I knew I wanted to dedicate my life to studying them.

After my time in Dr. Geist’s lab ended, I began seeking opportunities to gain hands-on experience with marine life. During this transition, I applied to the Texas Parks and Wildlife Department’s prestigious summer internship program at the Flower Bluff Hatchery, which specializes in raising redfish, trout, and flounder. I engaged in multiple interviews and eagerly awaited a response. Before hearing back, however, I decided to visit Corpus Christi’s local coral aquaculture and aquarium store facility. I walked in and asked to speak with the owner, Eli Alaniz, expressing my eagerness to learn everything I could about corals, even offering to work for free! To my surprise, Eli responded, “If you are willing to learn, then I am willing to teach.” Only days after this conversation, I was formally offered the sole position at the hatchery for the summer. I soon found myself facing one of the most difficult decisions of my academic career: should I accept this prestigious internship or pursue my passion for corals? Ultimately, after much deliberation, I made the difficult decision to call the hatchery manager and decline her offer, despite the time and effort invested in the interview process. While the hatchery position was an incredible opportunity and one many of my colleagues would have jumped at, my growing fascination and obsession with coral reef research and my determination to pursue it compelled me to dedicate my time to learning from the coral aquaculture master himself, Eli Alaniz. That conversation with Eli lead to a year-long un-paid opportunity which I subsequently became the lead aquarist of his facility, maintaining eleven saltwater reef aquariums housing diverse finfish and invertebrate species. I developed custom feeding protocols, fragmented corals, and applied script-based statistical methods to optimize day-to-day operations. This experience became one of the most formative of my career and taught me that as long as I knew what I wanted to do with my life that the universe would step aside such that I could make what I wanted happen.

My interest in plant genomics stems from my inherent desire to understand not only the molecular mechanics driving plants, but also how plants are intricately integrated into ecosystems alongside other flora and fauna. I believe that understanding ecosystems at each trophic level is essential for developing informed conservation strategies, and as Boyce Thompson emphasized, research plays a crucial role in addressing global challenges such as environmental sustainability. I view plant genomics as a potential tool for advancing conservation driven solutions, and by exploring plant genetics via the Plant Genome REU, I believe I can contribute to the growing body of knowledge necessary to address these challenges, particularly within the context of marine ecosystems.

Up until present day my current academic journey has equipped me with a strong foundation in both biological research and computational methods. As an undergraduate researcher I have had the fortunate to work on three research projects which have honed my skills in both hands-on techniques, lab work, and data analysis.

My academic career at university began with an initial project focused on the taxonomic identification of larval specimens collected during sampling trips in the Gulf of Mexico. The project aimed to investigate the processes and mechanisms influencing the survival of early life stages of finfish and other larval species. By the utilization of larval sampling techniques from boat-based surveys, we were able to predict recruitment success and population strength under changing environmental conditions. This initial project significantly deepened my understanding of the critical role early-stage marine organisms play in the health of fish populations and their ability to respond to environmental changes with respect to time.

Building on my first project, I then contributed to a study investigating shell morphology of Eastern oysters (Crassostrea virginica) collected from various locations along the Texas Gulf Coast. The objective of the study sought to determine whether variations in shell structure could be linked to genetic differences. Live oysters were collected and transported to a hatchery, where broodstock were raised, harvested, and analyzed using 3D structured light scanning techniques. By combining population-based biostatistics with advanced 3D imaging technology, the project explored how environmental factors and genetic variation influence oyster morphology. Our method established standardized methods for assessing oyster shell form utilizing structured light scanning techniques, which is now crucial for conservation and restoration efforts, particularly as Eastern oysters face challenges from climate change and overfishing along the Texas coast.

Currently, my ongoing research focuses on coral skeletons that were collected 40 years ago from Kwajalein Atoll in the Marshal Islands. Coral reefs, which support a vast array of marine life, have historically been difficult to assess in terms of biodiversity due to the challenges of identifying coral species based solely on their skeletal morphology. The project currently involves extracting DNA from coral skeletons that were preserved with sodium hypochlorite and applying next-generation sequencing (NGS) and metabarcoding techniques to assess the feasibility of DNA extraction from these preserved specimens. The goal is to currently identify coral species and their associated symbiotic organisms from the prepared skeletons, while also testing the hypothesis that the corals had rafted to the atoll from nearby islands using phylogeography. This work is critical for developing methods to quantify coral biodiversity, particularly as coral reefs face ongoing threats from environmental degradation.

It is through these diverse research experiences that have deepened my understanding of the intersection between biology, computational tools, and conservation. They have equipped me with valuable skills in genetic analysis, sequencing technologies, and data interpretation, all of which I am eager to apply to the study of plants!

Lastly, my experience as a General Chemistry teaching assistant and my leadership role in managing 17 other teaching assistants has honed my communication and leadership abilities. I have learned how to foster collaboration, manage complex tasks, and ensure the smooth operation of teaching General Chemistry I whilst being involved with multiple research projects in tandem, all of which are transferable skills that I will bring to the collaborative environment of the Boyce Thompson Institute.

Ultimately, I believe this Plant Genome REU program will provide me with the hands-on experience, mentorship, and exposure to cutting-edge research necessary for my academic and career goals in genomics, bioinformatics, and environmental science. The program’s interdisciplinary approach aligns perfectly with my career aspirations, as I am to bridge the fields of marine invertebrate biology and plant genomics to enhance our understanding and conservation of marine ecosystems. I am excited to bring my passion, skills, and interdisciplinary perspective to this program, and I am confident it will play a pivotal role in shaping my future research endeavors.