

Hollings Scholarship Essay
Heather Bruck

In a singular moment I realized what path I wanted to follow for the rest of my life—understanding and appreciating the complexity of marine ecosystems. While scuba diving along the coast of Roatan Island, Honduras, a 30 foot wall of corals with vibrant fish, sea turtles, and flowing sea fans arose in front of me. It was impossible to absorb the beauty of it all in the moment, but a part of me knew I had found my passion. I became captivated by the interactions of the animals in such an intricate environment and wanted to be able to help everyone experience the beauty of marine life.

Growing up in Ohio, the most valuable opportunity to explore underwater life was at the aquarium through glass panes. Learning about the organisms in such ecosystems strengthened my gratitude towards the service aspect of science where information is shared between researchers and the public. Without the aquarium and the decades of research that was shared with the community, I may have never been exposed to the wonders of the oceans or found a passion to dedicate my heart towards. Because of this, NOAA's mission to educate and inspire others resonates with me immensely. I have recognized first-hand the importance of sharing knowledge with the world to allow growth and appreciation of the life around us, especially understanding the importance of conservation and protection for these environments.

My mother would call me a “curious bee” on more than one occasion; there was always a desire to learn more about the living things around me. Whether trekking through creeks in the backyard looking for crawdads or nursing an injured bird back to health, I was determined to understand the life in my backyard while growing up. Throughout high school, pursuing a career involving research became more alluring. In the summer of 2017, I traveled to Honduras with Operation Wallacea on a research trip. One week was spent in the cloud forests of Tegucigalpa assisting graduate and doctorate students with research projects by collecting data and observations related to various organisms within the environment. Another week was spent scuba diving among the coral reefs along Roatan Island. Here I gained experience collecting coral and fish distribution data, as well as coral bleaching observations that would be used by multiple international research projects. My experience through Operation Wallacea allowed me to recognize the dedication and work ethic that goes into a career involving research, and it only made me more excited for the future. I learned first-hand how valuable sharing knowledge gathered through research is, as well as the ability to collaborate in a scientific environment. Involvement within a NOAA program would allow me to further share information and work within a team of researchers while gaining hands-on experience that can be used in future projects.

At the University of South Carolina, I have been fortunate to volunteer and work in Jeffrey Dudycha's lab in the biological sciences department through independent projects, as well as assisting graduate students with the experimental phase of their thesis project. In Dr. Dudycha's lab, I have performed microscopic data collection using GRYPHAX and ImageJ to photograph

and measure Daphnia that will be used for thesis projects. This past fall, I was able to return to campus and began assisting graduate student Matt Bruner with his project on mutation accumulation and fitness within different clones of Daphnia. I help transfer Daphnia to clean environments, feed them with algae, and when necessary take pictures and measurements. I was also hired in the fall to maintain algae used for food, wash beakers, filter fresh lake water for use as Daphnia environments, and take measurements for another graduate student's project focused on epigenetics. My experience in Dr. Dudycha's lab has been unforgettable; I have learned time management between lab work and school work, general lab procedures to ensure accuracy in experimental results, and of how rewarding research is. I find myself excited with every new thing I learn and how the research we are conducting can be used to analyze an organism's fitness in their environment.

During high school I volunteered at the Newport Aquarium in Cincinnati as an education coordinator. Using mobile carts filled with interactive educational items, I interacted with people passing through the aquarium to share information about the animals they were looking at and to emphasize the importance of protecting marine species. As I talked about sand tiger sharks and passed a set of teeth around, I could see children become interested in everything they could learn about sharks. I learned how impactful hands-on activities can be to help people understand things they were previously unsure or confused about. Because of this, I plan to use interactive activities as an educator to help people better understand the concept being discussed. My favorite days were when a child was initially apprehensive about the sharks, scared of their teeth and size, but became more curious and comfortable as I handed them the interactive tools and explained more about them. It was a heartwarming feeling to see their worries melt away as they realized the sharks were nothing to be afraid of. Those days are another reason I love the educational and stewardship aspect of research, especially related to research into the natural world. Changing a person's perspective of something from intimidating to interesting and fun is beyond rewarding.

My involvement with the local aquarium opened my eyes to the value of hands-on learning and service in field research. Although I was not able to conduct field research through the aquarium, the samples and information I discussed during the informal presentations were collected by scientists around the world. Using activities and objects helped peak interest in marine ecosystems and the importance of stewardship to protect the environments around us. After obtaining a PhD in Marine Ecology with a focus on environmental education, I hope to incorporate active learning in my lectures to help students retain information and understand the concepts discussed. I plan to contribute to the service of research by sharing the information I discover with other researchers and professors and potentially write a book encouraging conservation awareness. The scholarship and experience associated with the Hollings Scholarship would immensely assist with pursuing my educational goals.

Along with an interest in research, I also developed an affection for teaching. Throughout high school, I volunteered in a program to help students learn skills related to education such as time management, note taking, study advice, and much more. It was an incredible feeling to

watch a student grasp a concept they had been struggling with or push themselves to achieve a certain goal with your help. I was also a private tutor for about a year, assisting my student with calculus, biology, and chemistry. I greatly enjoyed helping people understand what they are learning and watch their confidence in their ability to do well in school grow. While some students absorbed the information we went over best with hands-on activities, others did so through watching videos and outside lessons. I learned how to adapt my teaching method for each student's strengths and how to manage helping multiple people at once while maintaining my studies.

Experience with a NOAA program would provide countless opportunities to help my progress towards a future career in research and education. After receiving a B.S. in Biological Sciences and a minor in Marine Sciences, I hope to work with NOAA in an educational field to help governments and communities make environmentally, socially, and economically responsible decisions. In the future, I hope to work with NOAA to make educational resources more engaging to assist people develop ocean literacy and recognize the importance the information contains. My experience curating lessons to each person's strengths and utilizing hands-on activities to encourage active retention would progress NOAA's goals of using education to make responsible decisions. NOAA's Coastal Ecosystem Learning Center Network is a program in which I hope to contribute to. A position in one of the aquariums or education centers would allow me to develop my ability to engage with people using education to encourage sustainability and marine protection. The desire to learn more about marine life and help others understand the importance of the natural world will never diminish. A position at NOAA would allow me to spread that passion to countless others and contribute to the stewardship, service, and science of the program I work with.