Jeff M. Martin, Ph.D. Student

Evolution of body size in large mammals is poorly understood but necessary to manage wildlife in a rapidly changing climate. My research examines thermal and nutritional drivers of body size in bison to predict their responses to changing environments. In a recent paper, I used the last 40,000 years of fossil data to demonstrate that body size of bison responds to changes in global temperature: as temperature warms body mass shrinks by 40 to 60 kg per Celsius degree. I am investigating two mechanisms for this phenomenon using modern bison populations. I use thermal imagery and tissue sampling along a north-south transect through the Great Plains to answer two questions: 1) do high temperatures cause heat loads that slow growth and diminish body size, and 2) do high temperatures alter the food supply and growth of tissue?

My fieldwork compares bison at 19 sites across a gradient of mean annual temperature from 0°C in the north (Saskatchewan) to 20°C in the south (Texas). The transect corresponds with a decrease in body mass of 30% from north to south. I use a high-fidelity and high-resolution thermal imaging camera to measure heat (energy) exchange between the animal and their local environment during the winter and summer (question 1 above). I also use stable isotopes of nitrogen and carbon in protein to assess food supply and growth of tissue (question 2 above). I will be attending the North American Wildlife and Natural Resources Conference in Norfolk, VA to present my research in the end of March.

Annie Montgomery, Senior

As a senior undergraduate in the Wildlife and Fisheries Sciences department, my studies are focused on wildlife ecology and conservation. Even though I plan to pursue a career in environmental science, I have a strong passion for the Earth’s fauna and their conservation. This passion grew from being raised on the outskirts of a small town where my time was spent outside getting to personally know the plants and animals around me. My entire life I knew I wanted to do something to help the wildlife around me.

In the summer of 2017, I joined the Undergraduate Research Program in the Ecological Systems Laboratory in the Department of Wildlife and Fisheries Sciences and started working closely with Dr. Hsiao-Hsuan “Rose” Wang. The lab promotes formal exposure to systems analysis and simulation as an important part of the training of professionals involved in ecology and natural resources. Through the program, my research focuses on determining the effects morbillivirus exposure had on bottlenose dolphins (Tursiops truncatus) population dynamics following the Deepwater Horizon oil spill in 2010. Working alongside Dr. Wang, we utilize the quantitative model to predict future population sizes based on specific environmental and ecological factors. Our goal through the project is to achieve a better understanding of species’ population dynamics with varying environmental and ecological effects and to gain hands-on experience using computational programs dealing with these parameters. I am using this project as my undergraduate honor thesis for LAUNCH: Undergraduate Research Scholars Program and ABS Conservation Scholars Program.

Madeline Jones, Senior

As a senior undergraduate in the Wildlife and Fisheries Sciences department, my studies are focused on wildlife ecology and management. I am looking forward to pursuing a career in environmental regulation, but I’ve always had a passion for work dealing with conservation of wildlife.

I joined the Undergraduate Research Program in the Ecological Systems Laboratory led by Dr. Hsiao-Hsuan “Rose” Wang in the summer of 2017 after I knew I wanted to get involved in research and began looking for opportunities within this department. I’ve had an interest in anthropogenic effects on environmental systems ever since I was exposed to classes in which we talked about conservation biology and conservation of natural resources. My research reflects this, as I am studying the effects of Deepwater Horizon oil spill on population dynamics of Loggerhead sea turtle (Caretta caretta). This research project is important for developing a greater understanding of the anthropogenic effects on marine ecosystems. Using the system approach to quantify the interesting question helps me to see the whole picture of the research. The computational work also has significantly contributed to my passion for wildlife conservation and research. I am currently conducting my undergraduate honor thesis for LAUNCH: Undergraduate Research Scholars Program and also one of 2017 – 2018 ABS Conservation Scholars.