I am a second-year PhD student in Biological Sciences at Michigan Technological University. I obtained my B.S. in Environmental Science from Northern Michigan University in 2023, and after graduation, I took a year off to gather knowledge and expertise in the fields of biogeochemistry and environmental science. I tentatively plan to defend my dissertation in the spring of 2029. The primary areas of research I will focus on in my PhD are microbial ecology, limnology, and biogeochemistry. Following a successful defense and graduation, I will participate in a post-doctorate program at either a federal or academic institution in a related field, which I expect to take 3-5 years to complete. Having held previous research positions in the federal government, I expect to do a postdoc in a federal facility. Following the completion of a post-doc, I plan to work for a federal agency such as the Department of Energy (DOE) as a scientific researcher. The total length of time should take about 10 years from now until my goal as a federal researcher. My anticipated career as a researcher would allow me to continue pursuing biogeochemistry and microbial ecology across a continuum of habitats. My overarching research interest is how biogeochemical and ecological processes change and impact one another from upland environments to freshwater environments. I have a special interest in the Great Lakes and would like to continue to incorporate the region into my future research because of the variability in lake processes, not just found between lakes but within them as well. The variation in land use, physical properties, and the differences in nutrient status between lakes offer unique insight into how biogeochemical and ecological processes interact with one another. The Great Lakes also follow a continuum of disturbance, which allows us to study a pristine system, like Lake Superior, and a heavily disturbed system like Lake Erie, which I hope to address with my proposed research and research I will conduct in my career.

The proposed research will help me reach my career goals in several ways. To begin with, just the act of submitting this proposal has given me valuable insight into what it is like being a PI and a researcher. This experience, regardless of the outcome, has provided me with the opportunity to develop methods and plan an experiment, all while considering how to budget and justify my research. This will become invaluable going forward as a researcher and is an experience I can draw from for the rest of my career. From the data I would collect, I would be able to conclude how microbial communities can possibly adapt when they experience nutrient concentrations that are different from what they typically exist in. I plan on looking at multiple ways in which communities adapt, which will guide my future research to ask more nuanced questions. I suspect that I will learn that the adaptive qualities of microbial communities are coupled, and that mechanistic lab studies may be necessary to specify how microbial communities adapt and why. Another advantageous outcome from receiving this fellowship would be the possibility of working with my identified NGO sponsor. I would effectively broaden my network and open the door to future collaborations in future projects. If given the opportunity, I believe that this fellowship would help propel me to my goal of becoming a research scientist, and allow me to conduct research in an area that I wish to establish a career in.