



THE UNIVERSITY OF MICHIGAN BIOLOGICAL STATION

In this cross-disciplinary, interactive community, students, faculty, and researchers from around the globe come together to learn about the natural world and seek solutions to critical environmental challenges.

Global environmental change is the greatest applied problem in human history. Threats to natural resources and human health are here, and scientific consensus says we must halve carbon emissions by 2030. To mitigate the crises already underway and prepare for the future, we need a diverse community of scientists working on the environment now.

The University of Michigan Biological Station (UMBS) is uniquely positioned to make a difference in this urgent shared mission. With over 100 years of accumulated place-based knowledge and 11,000+ acres of forested and water-rich property in northern Michigan, UMBS is a leading scientific field station dedicated to research and education. UMBS is exceptionally good at training students to approach complex problems with curiosity, reverence for the natural world, and an appreciation for the interconnected systems that unite us all. Researchers and alumni contribute thousands of peer-reviewed papers to the scientific and policy communities and occupy key positions in universities, research and advocacy agencies, schools, health professions, and businesses. Further, given Michigan's relatively cool climate and abundance of fresh water, it is predicted to become a climate refuge in the coming years—leading to increasing pressures on our natural resources. Understanding the past and preparing for the future has never been more important.

More researchers through the door means more brilliant minds leveraging our century-long datasets to discover forward-looking solutions to the environmental crises that threaten our health and natural resources. Therefore, reducing barriers to participation for students and researchers is our highest priority. This means ensuring our facilities are accessible, welcoming, and sustainable, increasing collaborative scholarship and research support, and expanding our dynamic and empowering educational programming.

However, like many field research stations around the world, UMBS lacks adequate resources to keep pace with the equipment and laboratory needs of modern scientific research, teaching, and community engagement. In order to generate difference-making science at full capacity, we must increase student and researcher support and bring our facilities into the 21st century.

We propose a five-year plan to bring UMBS to scale in four key areas, allowing us to fulfill our potential at the forefront of environmental research and education.

BUILDING A COLLABORATORY

A RESEARCH, EDUCATION, AND COMMUNITY ENGAGEMENT CENTER FOR THE 21ST CENTURY

If we are to tackle big, multi-faceted environmental problems, we must bring a diversity of scientific perspectives to the table and engage with our community partners. One of the strengths of UMBS is the confluence of our research and teaching missions. Solving modern field-based science problems—and educating the problem solvers—requires collaboration as well as exploration in technical methodology from genetics to chemistry. Students interact with researchers to solve problems together—but our seasonal and outdated teaching and research facilities are failing us. Further, our collaborative spaces and residential cabins must be able to accommodate researchers throughout the whole year, not just in the summer. A serious barrier to UMBS becoming a leading research institution is our 50+ year old laboratory and community facilities with outdated and energy intensive equipment unable to meet the standards of contemporary best practices.

We seek \$10M to create a “collaboratory” where researchers and students can work together to apply individual work to shared discovery and real-world solutions.

This includes:

- A visitor outreach center that engages the regional community in our important work
- Interactive classroom spaces that encourage collaboration
- State-of-the-art open concept research labs
- New four-seasons residential cabins to support year-round research and education



Amber Brewer (B.S. '22) first came to UMBS to check a box for her major. That one action led to multiple summers at the Bio Station, a love of chemistry, and a career in environmental health sciences. Like many students before her, a hands-on, immersive experience at UMBS inspired her to change her career trajectory and focus on the environment.

“My hometown has a massive PFAS issue in our water. Through chemistry at UMBS, I saw first-hand how dangerous and pervasive those common chemicals can be. When I went home at the end of August 2019, I had totally fallen in love with the idea of helping to mitigate the PFAS not only in my hometown, but the rest of the world.”

She decided to change her major to focus on the environment and health science. Her mentors at UMBS recognized her talent and hired her as a lab tech for the rest of summer 2019. She returned as a teaching assistant for the UMBS chemistry course in summer 2021. After finishing an accelerated master’s in environmental health sciences, she plans to apply to Ph.D. programs in toxicology—a path that would have remained untraveled had she not needed to creatively “check a box” to earn her chemistry credit.

SUPPORT WORLD-CLASS RESEARCH IN NORTHERN MICHIGAN

FUNDING FOR RESEARCHERS AND THEIR STUDENTS

UMBS has over 100 years of accumulated data we can use to understand how systems are changing—but those data are only valuable if we have an active and vibrant research community. Despite the urgency of our shared climate problem, funding for academic research on environmental problems has not kept pace. Competition for National Science Foundation funding is fierce, and critically important, thoughtfully planned proposals are routinely denied simply because there is not enough money to go around. We need support to help researchers establish new programs that continue to explore northern Michigan, utilize our century of place-based knowledge, and build bridges across existing projects that enable us to make new environmental inferences. Leveraging our rich data environment, scientists will explore emerging diseases, water resources, carbon cycle, biodiversity, global change, agroecology, student learning, and more. We seek \$500k to develop key research agendas and attract leaders in their field to do science at UMBS. This includes:

- Support of \$70-100k/scientist annually for early career researchers focused on leveraging UMBS data resources, UMBS property, and our diverse community of researchers to tackle novel questions and build capacity for new research.
- Support of \$10k/summer will ensure our ability to provide “starter” funding to support and recruit new researchers establishing a research program at UMBS and support existing long-term research that may be in between funding cycles.

TRAINING THE NEXT GENERATION OF ENVIRONMENTAL PROFESSIONALS

SUPPORT FOR UNDERGRADUATE RESEARCHERS

UMBS is particularly good at training students to become field-based researchers. Through mentorship, discovery, and robust independent projects, UMBS student researchers learn how to be scientists. Our goal is to make these transformative research experiences accessible for all, especially those who have been historically marginalized in STEM (Science, Technology, and Math) fields. Over the last 30+ years, we have built a successful Research Experience for Undergraduates (REU) program that offers undergraduate students a rare paid internship opportunity to design, conduct, analyze, and present their own mentored research addressing questions that are often important to northern Michigan landscapes and communities.

We seek \$225k annually to support a 12-week, 12 student research program that provides on-the-ground training for the next generation of climate change problem solvers. Over the course of three summers, we envision this program building a cohort of environmental change-makers. Additional student support gifts could go toward increased scholarship funding for undergraduates participating in our field-based spring, summer, and extension classes. Funding options include supporting individual students' internships for \$12k each.

CARBON NEUTRALITY

BUILDING A CARBON NEUTRAL, SUSTAINABLE, AND INCLUSIVE RESEARCH STATION

Much of our research focuses on global change—and the evidence is overwhelming: as a society, we must limit our carbon emissions in order to mitigate the effects of global warming. As a leading environmental research institution, UMBS is committed to “walking the walk,” including modeling potential design solutions to our northern Michigan neighbors. In order to do so, we seek to:

- Fund a staff forest manager and communication specialist who will study and maintain UMBS property for research, conservation, and carbon neutrality, and serve as a liaison to northern Michigan communities, for \$90k annually.
- Design a model building at UMBS that demonstrates how to “go carbon neutral at home” for northern Michigan neighbors and university alumni and community members at a cost of \$200k.
- Retrofit existing facilities and create new infrastructure that supports green energy without increasing UMBS’s footprint with an investment of \$10M.

WAYS TO FUND YOUR GIFT

Your gifts of cash, pledges, or appreciated securities change lives. Wills, estate, and planned gifts allow you to create a lasting legacy that will enable the best and brightest minds to experience a liberal arts education, solve problems in a changing world, and yield ideas and innovations that will make a difference in Michigan and around the globe.



“The opportunity to do research at the Bio Station grants students not only experiences that increase their skills in science but also a beautiful summer in nature, filled with friendship and bonding. The challenge of planning, scheduling field days during the summer, pacing the research project, and ensuring logistically that fieldwork is efficiently completed is an often overlooked skill that is actually incredibly important.”

–Cody Ladd, B.S. '19



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