**Two PhD positions and a master’s position in the Permafrost Microbiome**

The **Ernakovich Lab** is seeking candidates for **two PhD positions** in the [Natural Resources and Earth System Science (NRESS) PhD program](https://gradschool.unh.edu/natural-resources-earth-systems-science-phd) and **one master’s position** in the [Natural Resources – Ecosystems M.S.](https://colsa.unh.edu/natural-resources-environment/program/ms/natural-resources-ecosystem-science) **to start Fall semester 2022**. These positions aim to deepen the understanding of the ecological processes shaping permafrost microbiome composition and function post-thaw.

**Ernakovich Lab:** Our mission is to understand how disturbance and environmental change—ranging from agricultural management to permafrost thaw—affects the function of ecosystems, with a specific emphasis on carbon and nitrogen cycling (e.g., greenhouse gas production and soil organic matter formation).Ernakovich lab members are expected to contribute to a culture of communication, support, equity, service and accountability through open and honest dialogue, peer mentoring, and teamwork. Our group is tightknit and supportive. For more on our group culture and dynamics, please see our co-developed [Code of Conduct](https://docs.google.com/document/d/1qO-ghb2hePKt_P97GYp75Yh6qSDFhKoLnD1dS1_hM1o/edit).

**A bit about permafrost and the microbiome:** The permafrost-climate feedback is one of the least well-understood global climate feedbacks in the Earth system, owing to a lack of understanding of permafrost microbial communities. Microorganisms in permafrost experience a harsh environment like no other on Earth—frozen, salty, and resource limited—but these conditions change rapidly with permafrost thaw. There is limited data about how permafrost thaw affects the microbial community—or microbiome—including the ecological processes underpinning the composition of the post-thaw microbial community.

**Successful candidates will:** have a passion for research in microbial and ecosystem ecology; have a strong interest in bioinformatics and statistics (for which there is exceptional training at UNH and within the EMERGE institute – see below); have an interest in learning about and pursuing interdisciplinary, team science; desire mentoring junior scientists; be interested in practicing community-engaged scholarship; and be committed to fostering diverse and equitable science. A master’s degree or experience in a related field is preferred, but not required.

**Position 1. EMERGE Microbial Assembly PhD position:** This PhD position is funded through the NSF-funded [EMERGE Biology Integration Institute](https://emerge-bii.github.io/) a multi-institutional interdisciplinary team of researchers and educators that aim to better understand the impacts of permafrost thaw on methane emissions by studying the biological mechanisms underpinning increased gas emissions from a thawing permafrost peatland in Northern Sweden. The EMERGE Institute (and its predecessor IsoGenie) has collected high-throughput molecular data from peatland microbial communities (e.g., metagenomic, metatranscriptomic, metaproteomic and metabolomic datasets) for nearly a decade. Along with an interdisciplinary research team of microbial physiologists, analytical chemists, bioinformaticians, and ecologists, **this student will focus on linking multi-omic datasets to understand the abiotic-biotic and biotic-biotic forces shape the composition of the post-thaw microbial community**. EMERGE trainees are steeped in a culture of team science and are also encouraged to engage in outreach (e.g., community science presentations) and education (e.g., mentoring undergraduate students) efforts. Trainees also receive training in bioinformatics and statistics. While the focus of this position will be primarily computational and bioinformatic analysis, it will also require some laboratory work (but more could be added, if desired), and could include field work if desired. **This position is an excellent opportunity for students looking to improve/build their computational and research skills in a highly innovative and cross-disciplinary team of scientists.**

**Position 2. Disturbance ecology of the permafrost microbiome PhD position:** This PhD position is funded through an NSF CAREER award with the aim of identifying underlying “rules” governing how the post-thaw microbiome responds to the disturbance of permafrost thaw. **Successful candidates will be interested in applying concepts from disturbance ecology to microbial ecology with an eye towards bettering predictions of the post-disturbance (e.g., thaw) microbial community composition and function.** This project will include summer field work in Alaska and Sweden, laboratory work at UNH (including DNA extractions, metagenomic library preparation, and soil incubations), mentoring undergraduate researchers in course-based research experiences, spearheading bioinformatic and statistical approaches to analysis of microbial datasets, and networking with other permafrost microbial ecologists. Students without a master’s degree or with no prior teaching experience may start on a teaching assistantship before moving to a research assistantship. **This position is an excellent opportunity for students who are excited about applying theoretical ecology to climate-consequential ecosystems while improving their teaching, communication, and leadership skills.**

**Position 3. The role of dispersal in post-thaw microbiome composition master’s position:** This position will be funded through a teaching assistantship in the [Department of Natural Resources and the Environment](https://colsa.unh.edu/natural-resources-environment) with summer research supported by the EMERGE Biology Integration Institute (see more info about EMERGE in position 1). This student will focus on the role of dispersal in structuring the microbial community in a thawing permafrost peatland located in Abisko, Sweden. The student will be responsible for laboratory analyses (e.g., DNA and RNA extraction and preparation for sequencing), as well as bioinformatic analyses. This student will work closely with postdoctoral researcher, [Dr. Hannah Holland-Moritz](https://hhollandmoritz.github.io/).

**Opportunities for Arctic researchers at UNH:** UNH hosts a variety of experts in Arctic research, brought together under the [*UNH Arctic*](https://marine.unh.edu/arctic)umbrella, in which the Ernakovich lab is active. UNH students can take advantage of the broad expertise of this group, as well as the greater [New England Arctic Network](https://mypages.unh.edu/ne-arctic-convergence/home). UNH is a member institution of [UArctic](https://www.uarctic.org/), which affords students at participating institutions additional opportunities to work and travel abroad, as well as to join working groups relevant to your expertise. UNH has recently been successful at obtaining funding for graduate education in Arctic research, and your mentor is active on both these awards and would support your application to these programs. See more about the [CARPE](https://marine.unh.edu/carpe-nrt) 2-year NSF graduate research traineeship and the summer [ICE-TALKS](https://www.unh.edu/leitzel-center/programs/ice-talks) program.

**About UNH:** The [University of New Hampshire](https://www.unh.edu/main/about-unh) is an R1 research institution that provides high-quality undergraduate and graduate programs of distinction. Located on a 188-acre campus in Durham, UNH is situated in a dynamic and beautiful part of New England. Approximately one hour from both Boston and Portland (by train, bus, or car), Durham is also conveniently close to the Atlantic Ocean, the White Mountains, and New Hampshire’s Lake Region.

UNH is located on the homeland of the Pennacook, Abenaki, and Wabanaki Peoples, and we wish to acknowledge their spiritual and physical connection to N’dakinna (homeland) and the aki (land), nebi (water), olakwika (flora), and awaasak (fauna) which the University of New Hampshire community is honored to steward today. We acknowledge the hardships they continue to endure after the loss of unceded homelands and champion the university’s responsibility to foster relationships and opportunities that strengthen the well-being of the Indigenous People who carry forward the traditions of their ancestors.

Please direct any questions about the positions to [Jessica.Ernakovich@unh.edu](mailto:Jessica.Ernakovich@unh.edu). **If you are interested in applying for these positions, please fill out this** [**google survey**](https://forms.gle/1t1FFBQpZkNvjKhC6) **and Jessica will contact you!**