University of Minnesota
Water Resource Sciences Graduate Program
Graduate Research Assistant Position Description
Start date: Aug 2024
Location: St. Paul, Minnesota

We are recruiting a MS or PhD-level graduate research assistant to start August 2024 to work on developing protocols for use on a portable, rapid environmental DNA (eDNA) metabarcoding tool, the MinION, for use in detecting aquatic invasive plant species in freshwater lakes and rivers. The successful candidate will work as part of a collaborative team to produce protocols for using the MinION device for identifying aquatic invasive plant species, including: identifying metabarcoding markers for approximately 40 aquatic invasive plant species; optimizing the protocols; conducting occupancy modeling for true detection rates; and sharing findings through workshops. This project builds upon work done by the US Geological Survey (USGS) on occupancy modeling and eDNA detection and has co-PIs from USGS and University of Minnesota. At new invasion sites, traditional field-based plants surveys typically detect the invasive only after the plant is established in high abundance and therefore difficult or impossible to eradicate. Using eDNA metabarcoding can provide detection data simultaneously for entire communities, including invasives. The development of a rapid, portable eDNA detection method using the MinION device will aid in the early detection and rapid response (EDRR) of aquatic invasive plant species. There is the possibility to start working on the project (paid) in Summer 2024. Students from underrepresented groups and/or with diverse backgrounds are highly encouraged to apply.

Responsibilities will include:
• Field work to collect eDNA samples along with traditional field-based plant surveys.
Metabarcoding work on Illumina sequencing device and MinION
• Data management for genetics work and occupancy modeling.
Meeting with collaborators.
• Conducting statistical analyses including occupancy modeling.
• Lead data analysis, visualization, publishing manuscripts, and presenting/communicating results to a wide range of audiences.
• Assist with workshops.
• Contribute to report writing and budget management.

Qualifications:
Successful candidates must possess (by the position start date) a bachelor's degree in biology, ecology, fisheries science, genetics, plant biology, statistics, mathematics, or a related field. Strong preference will be given to candidates who have experience using eDNA. A strong work ethic, good communication skills, attention to detail, interest in fisheries science with management implications, and the ability to work both collaboratively and independently are critical. Interest or experience in quantitative modeling (using R), database management, and data visualization are required.

Stipend and Benefits:
Graduate research assistants receive a stipend of $26,942 annually as well as tuition remission and health benefits. More information on benefits can be found here: https://shb.umn.edu/health-plans/gahp-home. More information on the graduate student union can be found here: https://umnglu.org/

To apply: Interested candidates should send an email with subject "Aquatic invasive plant eDNA in UMRB" including a one-page cover letter describing their qualifications and interest along with their CV to Dr. Lynn Waterhouse (lwater@umn.edu).

Applications will be accepted through the WRS graduate program's online application system following preliminary review of candidates. Formal applications to the graduate program are due December 1st and more information can be found here: https://wrs.umn.edu/prospective-students