

Job Description



Job Title:	Ecology Research Technician
Department:	Biology
Reports To:	Prof. Heidi Swanson
Jobs Reporting:	none
Salary Grade:	USG 8
Effective Date:	December 2017

Primary Purpose

The incumbent will provide technical and scientific expertise for development, execution, and coordination of research projects related to assessing the impacts and risk of anthropogenic stressors on aquatic ecosystems. The incumbent will assist Prof. Swanson with preparing project deliverables and provide leadership and supervision for experimental and field experiments/collections, analytical instrument operations, and data analyses, including QA/QC and training of graduate students and technicians.

Key Accountabilities

Research Project Coordination and Data Analysis:

- Lead on several independent, innovative research projects within the scope of the lab expertise
- Develop project proposals, apply for funding, and design, conduct, analyze, and summarize the results of these projects.
- Leadership in design, planning, set-up and monitoring of research projects.
- Leadership in the preparation of scientific reports and articles. Conduct literature searches, review and prepare manuscripts and make informal and formal presentations
- Make scientific and technical presentations at local, national and international meetings.
- Conduct literature reviews on specialized topics

Laboratory Administration:

- Responsible for planning and oversight of laboratory operations in aquatic ecology and environmental toxicology.
- Plan, organize, conduct and support a variety of research projects on aquatic ecology (fish and invertebrates) at sites mainly in northern Canada, but also internationally.
- Assist with implementation of training workshops and programs.
- Hire and oversee the work of casual employees (e.g. contractors, work term students, work study students).
- Support and participate in technical training (e.g. demonstrations) for graduate and undergraduate students and visiting fellows and researchers.
- Coordination, maintenance, and analysis of databases for lab-generated data.
- Take leadership in the coordination, administration and implementation of training programs

Field Work Coordination:

- Resolve problems related to the preparation and implementation of research projects including the sampling (laboratory and field) of biological and environmental samples, preparation and analyses of contaminants in complex environmental matrices.
- Oversee and ensure the quality of data and the safe operation of the laboratory and field operations

Laboratory Operation:

- Lead the development and validation of methods for analysis of contaminants, such as mercury found in the environment. They will
- Ensure the operation and maintenance of a contaminant analysis laboratory, including the maintenance, operation and troubleshooting of instruments, computers, and related support equipment.
- Application of advanced sample collection methods for environmental matrices including water, sediment and biota for contaminants.
- Preservation of samples to ensure quality, e.g., surrogates spiking, blanks, prevention of biological activity, etc.
- Application of sample preparation for contaminants and stable isotopes. Use of freeze-drier, microbalances, and mercury analyzers.
- Use of data acquisition software and management of the research databases.

Field Operation:

- Responsible for the safe coordination of field sampling and operations that support collection of environmental samples for bioassessments, as well as setting up and executing laboratory based experiments.
- Collection of biota (e.g. algae, invertebrates, fish) from aquatic environments. Applying standardized techniques to sample biota for community, population and biochemical endpoints.
- Coordination of projects to collect wild fish for selected endpoints using electrofishing and netting techniques. Maintain certification for fish collection, handling and electrofishing techniques
- Coordination of lab based bioassay and field caging experiments with biota (e.g. fish), including set-up, sampling and monitoring.
- Ensuring fish collection licensing/permit requirements and animal care protocols.
- Ensuring proficient basic field collections and operations, including safety, driving of vehicles (trucks) and trailers, water samplers, sediment cores and grabs, D-nets, and fish collections.
- Support, plan and lead biological field sampling using a working knowledge of sampling techniques for water, fish and invertebrates, as well an ability to support laboratory and field experimentation (e.g. live fish surgery for acoustic telemetry).

Technical and Analytical Duties:

- Oversee and ensure the quality of data, compliance and the safe operation of the laboratory.
- Maintain the equipment and instrumentation and ensure QA/QC of laboratory and field operations.
- Responsible for purchasing, maintenance, operation and installation of a wide variety of measurement devices associated with sampling of water, sediments and biological samples.
- Responsible for the monitoring and maintaining of the proper functioning of the analytical laboratory including related field sampling equipment.
- Responsible for sample planning, control and reporting of results along with QA/QC.
- Ensuring Quality Assurance and Quality Control (QA/QC) and Good Laboratory Practices (GLP) on all lab and field procedures.
- Write and maintain the technical procedures (SOPs) and records for all techniques including QA/QC procedure and Good Lab Practices (GLP).
- Oversee purchasing and budgeting for lab operation and field research facilities (ranging from \$200K to >\$500 M/year).
- Ensure maintenance of lab infrastructure (estimated value >>\$2M)

Required Qualifications

Education <ul style="list-style-type: none">• MSc in biology or environmental sciences required, PhD preferred.
Experience <ul style="list-style-type: none">• 5 years of experience in field ecology and ecotoxicology with an environmental laboratory (required)• Experience in spatial statistics, DNA barcoding, food web ecology, benthic invertebrate community composition, fish movement studies with acoustic telemetry, mercury dynamics, stable isotope and fatty acid profile ecology, ecotoxicology, trace analysis, and statistical analysis (required)• Experience with field portable instrumentation, boats, small motors (required)• Experience and expertise in environmental contaminants analysis including the operation and maintenance of mercury analysis equipment and instrumentation such as LUMEX portable mercury analyzer (preferred)• Expert level of knowledge in subject areas including single species and hierarchical community-level occupancy modeling (preferred)
Knowledge/Skills/Abilities <ul style="list-style-type: none">• Advanced knowledge of experimental design and complex data analysis, including statistical modeling, spatial analysis, multivariate ordination, and standard statistical procedures• Ability to develop and maintain large databases using proprietary software• Advanced knowledge in proposal development, and high level scientific writing and presentation of results to technical audiences• Method development, QA/QC mercury analysis and ability to present and prepare reports of data.• Extensive experience in project planning, budgeting and management• Ability to operate a laboratory and field sampling/collection program safely and efficiently for environmental matrices including water, sediment, benthos and fish• Ability to administer, organize, and lead training workshops and programs• Knowledge and experience in shipping of dangerous goods and field equipment.• Detailed knowledge of atomic absorption and mass spectrometer systems to develop and perform novel and innovative methodologies

Nature and Scope

- **Contacts:** The position will require strong interpersonal skills in order to manage laboratory and field operations that will include liaising with First Nations communities, numerous vendors, shipping companies, university faculty and staff, graduate students, and researchers. These interactions require cultural sensitivity, professionalism, patience and considerable judgement. Examples include the discussion of research plans and technical requirements with researchers, the negotiation with vendors for instruments and equipment (often with hundreds of thousands of dollars), the training of students and scientific collaborators, discussions with research partners in government and industry, setting work schedules, etc. Internally the person will mainly obtain action, reach agreement and negotiate solutions with other key personnel. Externally they will deal with and influence suppliers and collaborators (researchers). The incumbent will also interact independently and professionally with collaborators and stakeholders within the research group, the University of Waterloo and outside (academia, industry, government) nationally and internationally

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- **Level of Responsibility:** The job has specialized work with some supervision of others (casual hires/contractors) but provides considerable direction and authority to support others (e.g. clients, students). The position will require the safe operation of the laboratory and field equipment, management of work load, training of staff, students and collaborating researchers, maintenance of over \$2M worth of advanced instrumentation. The incumbent will be required to develop new novel analytical methodologies using advanced techniques and instrumentation (e.g. LC-MS/MS); ensure quality (QA/QC) and manage some reporting. They will review and manage budgets and prepare invoices for lab services. They will participate in the administration of major training initiatives and programs.
- **Decision-Making Authority:** Though the person will answer to the senior researcher for overall scientific direction, they will have considerable latitude with respect to operation of the lab, invoicing, experimental design, data analysis and report presentation. They will have signing authority on select operational accounts (in the range of \$500K/year) and support the PI in managing research accounts (in the range of \$100K->\$1M/year). They will schedule use of instrument and equipment in the lab. They will direct and hire junior staff (short-term contracts) and temporary help (such as summer students). The incumbent will be required to do considerable problem solving and work independently with minimal supervision. They will be expected to address problems and seek and implement solutions on their own.
- **Physical and Sensory Demands:** Although normal days will not be physically challenging, some periods of time (field operations) will require moderate to high levels of physical and emotional effort (fatigue and risk). The position requires the person to balance many conflicting demands and priorities. There will be a significant amount of personal interaction with a wide variety of different cultural backgrounds, and various project stakeholders and there will be numerous deadlines related to operation of the equipment and reporting. The person will work in the laboratory with loud continuous noise where hearing protection may be required. Lab work requires the use of solvents and chemicals. Field work may require long hours and adverse weather conditions and use of boats, electrofishing gear, driving of small trucks and trailers. The work will require the handling of live animals, and environmental samples.
- **Working Environment:** The position will be located primarily in the office and laboratories of the Department of Biology and will include frequent longer field trips in remote northern regions of North America, as well as other parts of Canada, often under adverse weather and living conditions. The position requires work around water (rivers, streams, lakes, and in the laboratory) and remote areas lacking regular cellular phone contact, and road and basic infrastructure access. The maintenance and operation of the field infrastructure will require a significant amount of time in the field occasionally requiring irregular and extended work hours during field or laboratory experimentation. There will be some air and long-distance driving required to field locations, workshops and conferences. Some remote travel will require a high degree of knowledge, skill, and comfort with these potentially hazardous travel conditions. The majority of the work is in office management, data analysis, budgetary management, and report writing, etc. There is potential exposure to hazardous chemicals and situations in the laboratory.