Postdoctoral Research Fellow – GHG Modeling

Location: Boreal Ecosystems Research Facility/Grenfell Campus, Memorial University of Newfoundland, Corner Brook, NL, Canada
Category: Research
Group: Postdoctoral Research
Department: School of Science and the Environment
Duration: 1-year, possible extension for the 2nd year and beyond based on performance
Tenure: Full-time; Grant funded
Salary: $60,000/annum + plus benefits
Deadline: Applications will be reviewed on an ongoing basis until the position is filled
Anticipated Start: January 1, 2025

Position Summary

Modeling N_2O Emissions under Variable N-Application and Sustainable Nitrogen Management in Precision Agriculture

We are seeking a highly motivated and skilled postdoctoral researcher to join our interdisciplinary team focused on advancing sustainable nitrogen (N) management in agriculture. This position offers a unique opportunity to contribute to cutting-edge research on the predicted relationship between two functions: 1) Yield as function of N fertilizer applied, 2) Cumulative nitrous oxide emission as a function of N fertilizer application. Modeling N_2O emissions under variable N fertilizer application rates, and the role of N management in yield variability and stability, all within the context of precision agriculture.

We are seeking a PDF with expertise and research interests in the following:

- **N_2O Emissions Research:** Investigate the impact of different N fertilizer application strategies, including variable rates and recommended practices, on N_2O emissions. Your work will contribute to understanding how N management can be optimized to reduce greenhouse gas emissions through modeling.
- **N_2O Modeling:** Contribute to the development and improvement of N_2O emission models, with a focus on integrating these models into sustainable N management practices. Your work will help bridge the gap between modeling and field applications, supporting more accurate predictions of N_2O emissions.
- **Yield Variability and Stability:** Analyze the relationship between N fertilizer application strategies and crop yield variability/stability. Your research will focus on how variable rates of N can enhance yield consistency across different environmental conditions.
- **Precision Agriculture:** Develop and refine variable rate N application strategies to support the implementation of precision agriculture. You will work closely with agronomists, soil scientists, crop modelers and data analysts to ensure that N management practices are both economically viable and environmentally sustainable.
- **Sustainable Nitrogen Management:** Collaborate on projects aimed at promoting sustainable N management practices that balance productivity and environmental stewardship. Your research will play a crucial role in shaping future N management strategies, guidelines and policies.

REQUIRED EXPERTISE, EXPERIENCE AND SKILLS

Basic qualifications:

- A Ph.D. in Agronomy, Soil Science, Environmental Science, or a related field.
- Strong background in nitrogen cycling, greenhouse gas emissions, and/or precision agriculture.
- Proficiency in GHG modeling with special emphasis on N_2O modeling and statistical analysis.
- Experience with field-based research, including data collection and analysis.
- A passion for advancing sustainable agriculture practices.
- Ability to work with interdisciplinary teams, including graduate students, scientists, and policy experts.
- Strong written and oral communication skills for publishing research and presenting findings to both scientific and non-scientific audiences.
- Experience in writing new research grants and strong industry relationships to generate new funding opportunities and serve as a Co-applicant on future grant proposals.

Specific qualifications:

1. Modeling and Simulation Expertise

- Proficiency in developing and implementing models related to GHG emissions, transport, and mitigation. Experience with software tools and platforms such as MATLAB, R, Python, or specialized environmental modeling software (e.g., WRF-Chem, GEOS-Chem). Skills in applying statistical methods to model evaluation, sensitivity analysis, and uncertainty quantification.

2. Domain Knowledge

- Strong understanding of the science behind GHGs, including sources, sinks, and the global carbon cycle. Background in environmental processes, including atmospheric chemistry, biogeochemical cycles, and land-use impacts on GHG emissions.

3. Data Analysis and Management

- Experience with integrating observational data (e.g., satellite, in-situ measurements) into models. Skills in managing and analyzing large datasets, including remote sensing data, atmospheric measurements, and emissions inventories. Familiarity with using **machine learning techniques** for predictive modeling and data-driven insights in GHG studies.

4. Field and Laboratory Experience

- Experience with GHG measurement techniques, including flux towers, chamber measurements, and remote sensing tools. Experience in conducting field campaigns for data collection related to GHG sources and sinks. Proficiency in laboratory techniques for analyzing GHG samples.

5. Programming and Software Development

- Proficiency in programming languages such as Python, R, or Fortran, often used in environmental modeling. Experience in developing, maintaining, and optimizing code for model simulations and data processing.

6. Project Management and Leadership

- Experience in managing research projects, including planning, budgeting, and coordinating with multiple stakeholders. Ability to mentor students, lead research initiatives, and contribute to grant writing and proposal development.

7. Publication and Dissemination

- Proven track record of publishing in peer-reviewed journals. Experience in presenting research at international conferences and workshops.

8. Ethics and Sustainability

- Understanding of ethical considerations in environmental research, particularly related to GHG studies. Familiarity with the principles of sustainability and their application in GHG mitigation strategies.

APPLICATION CLOSING DATE: **September 30, 2024**

THE ANTICIPATED START DATE: **January 1, 2025**

HOW TO APPLY

Prospective candidates should submit a cover letter outlining your fit with the research interests and required expertise, a curriculum vitae (with a full publication list), and the names of three referees willing to provide letters of reference on your behalf.

Please send all applications electronically or inquiries to **Dr. Lakshman Galagedara** (lgalagedara@mun.ca) OR **Dr. Mumtaz Cheema** (macheema@mun.ca)

Applications will be reviewed on an ongoing basis until the position is filled.

Memorial University is an equal-opportunity employer and is committed to increasing the diversity of its workforce. It welcomes applications from women, members of minority groups, and others who would bring additional dimensions to the university's research and teaching.

All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority. Memorial University is strongly committed to employment equity-diversity-inclusion and especially welcomes applications from all qualified candidates, including women, members of visible minorities, Aboriginal persons, members of sexual minorities, and persons with disabilities.

We thank all applicants for their interest; however, only those selected for an interview will be contacted.