Funded Research Opportunity: Model integration specialist

Project: Residential development Impact Scorecard for the Environment (RISE)

The RISE project examines the impact of residential land developments on climate change mitigation with special attention to terrestrial-aquatic interaction effects. Our aim is to leverage our findings to encourage more climate-friendly practices in the residential development sector.

We seek a qualified **integrated modelling** research scientist to join the RISE project, who will be responsible for ensuring best practices for integration, verification, and validation of integrated project models. They will identify and apply best-practice methods such as threshold analysis, regression trees, and data visualization methods to identify key system thresholds, tipping points, and triggers of non-linear positive or negative changes in system outcomes.

Duties will include:
1. Assist the research team to identify and match data inputs and outputs among project components;
2. Identify and document model verification and validation plans;
3. Develop generic residential development site plan typologies, representative of diverse development types (brownfield, infill, greenfield);
4. Simulate functional indicator trajectories for various landscape typologies across a range of plausible model parameters (such as projected climatic conditions) and use these data to identify thresholds, tipping points, and non-linear change within the dynamics of the coupled model;
5. Co-supervise junior personnel, including undergraduate co-op and graduate students;
6. Attend key conferences as funding allows;
7. Contribute scientific overview briefings for annual report and outreach sessions;
8. Lead story development for popularized science media outlets;
9. Lead a special issue for the project's capstone conference for an appropriate specialist journal;
10. Lead or assist with project capstone paper in a high-impact publication outlet.

Required qualifications:
1. Demonstrated expertise in interdisciplinary simulation modelling.
2. Demonstrated understanding and ability to apply best practices in simulation modelling, including model documentation, sensitivity analysis, and uncertainty analysis.
3. A strong academic/training record commensurate with these required skills.
4. Demonstrated excellence in academic publication, commensurate with career stage.
5. Demonstrated ability to work collaboratively and respectfully in diverse, interdisciplinary research settings.
6. Demonstrated ability to follow directions and complete tasks in a timely manner.
7. Demonstrated ability to work independently, while seeking feedback and guidance as needed.

Desired qualifications:
1. Demonstrated understanding of complex systems science.
2. Expertise in spatial optimization.
3. Expertise with statistical inference, especially causal inference.

4. Basic understanding of the role of natural and engineered green infrastructure to sequester carbon and manage stormwater runoff.
5. Experience with Biom-BGC or similar ecosystem models.
6. Basic training in urban design.
7. Demonstrated ability to interact with various planning actors/stakeholders, including professional planners and developers.
8. Understanding of site plan development.
9. Demonstrated ability to lead publications and other outreach activities.

This position is available flexibly as research assistantship (exceptional graduate student candidates), research scientist position (candidates with completed master's degree), or postdoctoral position. For research scientist and post-doc positions, **initial appointment term will be 1-2 years**, with renewal possible until the anticipated project end date in August 2027. **Initial salary range** is $45,000-$65,000, depending on qualifications and experience. For post-doctoral fellows, additional information including benefits is available on Graduate Studies and Postdoctoral Affairs.

Apply by 1 August 2024 for full consideration. To apply:
1. Send an e-mail to Dawn Parker, Michael Drescher, and Derek Robinson (see website links for e-mail) with heading "RISE Integrated Modeller application" followed by your name.
2. Include a maximum 3-page, 12-point font cover letter explaining your interest in and preparedness for this position. Evidence of preparedness can include previous training, work experience, publications, or other. Please identify what model of funding you are seeking (graduate, research scientist, or post-doc). In an additional half page, you may highlight any relevant lived experience or challenges relevant to your training or work.
3. Include a recent CV, transcripts, the names and contact information for three references, and a writing sample.
4. We will only contact competitive candidates for an interview. We appreciate the time and effort that you might take to apply.

The University of Waterloo regards equity and diversity as an integral part of academic excellence and is committed to accessibility for all employees. We encourage applications from candidates who have been historically disadvantaged and marginalized, including applicants who identify as Indigenous peoples (e.g., First Nations, Métis, Inuit/Inuk), Black, racialized, people with disabilities, women and/or 2SLGBTQ+.

The University of Waterloo is committed to accessibility for persons with disabilities. If you have any application, interview or workplace accommodation requests, please contact Occupational Health (occupationalhealth@uwaterloo.ca or Karen Parkinson – extension 40538) who will work with the selection committee to secure accommodation while ensuring that the information is safe-guarded and confidentiality is maintained.

The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. Our active work toward reconciliation takes place across our campuses through research, learning, teaching, and community building, and is centralized within our Office of Indigenous Relations.