



University of Manitoba · Civil Engineering

PhD positions

Openings

Two, fully funded

Start

September 2027

Priority consideration

30 October 2026

Term

Four years

Climate extremes are reshaping water, agriculture, and the communities that depend on both. Translating climate information into decisions requires more than improved forecasts; it requires evidence on who is affected, by how much, and when action is warranted.

The **Hydroclimate–Society Lab** (hc2x.github.io), led by Dr. Donghoon Lee, is recruiting two PhD researchers to address this problem from two complementary directions: climate risk and the adaptation decisions that follow from it, and crop yield modelling together with the agricultural data that underpin it.

Position 01 · page 2

Climate impact and policy modelling

From climate hazard to societal impact, and to the adaptation and policy decisions that evidence should inform. Funded by an NSERC Discovery Grant.

Position 02 · page 3

Agricultural monitoring and crop yield modelling

Satellite observations, climate reanalysis and forecasts, and geospatial foundation models — with the harmonized statistics needed to evaluate them. Funded by a Canada Research Chair.

01

At a glance

Funding
NSERC Discovery
Grant

Start
September 2027

Term
Four years

Climate impact and policy modelling

Linking climate hazard, societal impact, and policy response.

This position develops the link between climate extremes and the losses they produce, and translates that link into evidence for the policies intended to reduce them.

The project develops an integrated modelling framework for Canada that connects climate extremes to their societal consequences. Compound extremes — overlapping droughts, heatwaves, floods, and wildfires — are represented as hazard footprints, combined with socio-economic vulnerability, and linked to observed disaster losses. The student will lead the disaster-impact modelling at the centre of that framework.

The framework is designed to support simulation modelling of how households, communities, and governments respond to recurring shocks, and policy evaluation of which adaptation strategies remain effective when future conditions depart from central projections.

What we look for

- A bachelor's degree (master's preferred) in civil or environmental engineering, climate science, geography, statistics, economics, or a related discipline.
- Experience with gridded climate datasets and geospatial analysis.
- Strong programming and modelling skills in Python, including the ability to develop and evaluate models rather than only apply existing ones. A public GitHub portfolio is highly recommended.
- Interest in linking physical hazard modelling to societal outcomes, including disaster losses, exposure and vulnerability, and adaptation policy. Experience with agent-based or simulation modelling is an asset but not a requirement.
- Strong written communication, including the ability to convey quantitative results to non-specialist audiences.
- All admission requirements of the UM Faculty of Graduate Studies: umanitoba.ca/explore/programs-of-study/civil-engineering-phd

02

At a glance

Funding
Canada Research
Chair

Start
September 2027

Term
Four years

Agricultural monitoring and crop yield modelling

The data problem comes before the modelling problem.

This position addresses two connected components of the research programme: the production of the agricultural data on which models are trained and evaluated, and the development of the models themselves.

HarvestStat (harveststat.org) is an open international effort to harmonize subnational crop statistics, which provide the ground reference for most satellite-based yield estimates. The research here concerns data production itself: maintaining and extending the archive, characterizing uncertainty in official statistics, and designing the future data products the field will require.

The modelling component combines **satellite data**, **climate reanalysis and forecasts**, and **geospatial foundation models** and other deep learning approaches to predict crop yields across regions and growing seasons, with emphasis on methods that transfer to regions where training data are limited.

What we look for

- A bachelor's degree (master's preferred) in civil, environmental, or biosystems engineering, remote sensing, agronomy, geography, data science, or a related discipline.
- Experience with Earth observation data and cloud- or HPC-based geospatial processing — Google Earth Engine, Digital Research Alliance of Canada, or equivalent.
- Strong Python and applied machine learning or AI for scientific problems. A public GitHub portfolio is highly recommended.
- Experience with, or demonstrated interest in, open data practice — data curation, documentation, and reproducible pipelines.
- Willingness to work with heterogeneous real-world datasets and with international collaborators across time zones.
- All admission requirements of the UM Faculty of Graduate Studies: umanitoba.ca/explore/programs-of-study/civil-engineering-phd



Key dates

Priority consideration
30 October 2026

Start
September 2027

Contact
donghoon.lee
@umanitoba.ca

What you get, and how to apply

Both positions

- A guaranteed four-year funding package.
- Performance-based scholarships awarded within the lab, in addition to the base package.
- Support in applying for external fellowships — NSERC CGS-D, UMan Graduate Fellowship, Research Manitoba.
- Advanced computing through the Digital Research Alliance of Canada and dedicated lab resources.
- Interdisciplinary collaboration across engineering, climate science, and data science, and with government and international partners.
- Professional development: conference travel, workshops, scientific writing, and career mentoring.
- A research environment in which open code and open data are treated as core research outputs.

Priority consideration

30 October 2026

Applicants should complete the **2027F-GRA Research Interest Form**, indicating the position to which they are applying. The form provides detailed guidelines and the review procedure.

Form: forms.gle/ZMj3XvWHJ5LcKCuz9

- The appointment begins in **September 2027**.
- Applications are reviewed on a rolling basis until the positions are filled; only shortlisted candidates will be contacted and invited to an online interview.
Applications submitted by email will not be considered.
- Enquiries regarding fit or eligibility may be directed to donghoon.lee@umanitoba.ca.

Equity, diversity, and inclusion. The lab is committed to an equitable, diverse, and inclusive research environment, and welcomes applicants from all backgrounds.

The University of Manitoba is a U15 research university in Winnipeg, on Treaty 1 territory and the National Homeland of the Red River Métis.

