

## Environmental Sciences: MES, MSc, PhD

The School of Environmental Sciences (SES) offers a range of post-graduate programs geared to recent graduates, working professionals, and those interested in a research career. Our expertise spans several disciplines including apiculture, atmospheric and Earth sciences, ecology, entomology, environmental microbiology, plant pathology and protection, soil science, and environmental toxicology.

[uoguelph.ca/ses](http://uoguelph.ca/ses)

### Programs

We offer two Master's options and a Doctoral program. The Master of Environmental Sciences (MES) consists of either course work or course work plus a major research paper (usually completed in three semesters). The Master of Science (MSc) consists of three courses and defense of a research-based thesis and is completed in six semesters. The PhD program requires the successful completion of one course, a qualifying exam and the completion and defense of a research-based thesis and is usually completed in twelve semesters.

### Research Fields (PhD)

- Earth and Atmospheric Sciences
- Ecosystem Science and Biodiversity
- Plant and Environmental Health

### Admission Requirements

Applicants require an honours science four-year degree, with a minimum "B-" (Master's) or A- (PhD) standing for the last four semesters completed prior to entry into the graduate program.

### Funding

Students in the MSc program will receive a minimum funding of \$16,500 per year over a 2-year eligibility period.

PhD students will receive a minimum funding of \$20,500 per year over a 3-year eligibility period.



*"My supervisor does a great job at pushing his students to always complete their work to the best of their abilities, while simultaneously ensuring that they have the necessary guidance and skills to complete the tasks he asks of them."*

– Matthew Rudland (MSc)

Additional funding is available for NSERC scholars and International students and all students may be guaranteed one or several teaching assistantships worth an additional \$2800 depending on their program and entering average.

### Experiential Training

A central part of the MSc and PhD programs is the completion of a research project or thesis. Students will experience research first-hand under the supervision of a faculty advisor, which will involve formulating a research problem, collecting and analysing one or a combination of field and lab data, critical analysis and interpretation of those data in the context of existing literature. All students (including MES) can choose courses that are almost entirely field and lab-based, combining hands-on experience with the tools and methods for that field of study.

### Application Deadline:

**MES:** February 1 (International) and April 15 (Domestic only)

**MSc & PhD:** Ongoing

### ARE YOU INTERESTED IN:

- Impacts of climate change on agriculture & ecosystems
- Protection of plants & pollinators
- Soil science & soil health
- Ecological change & environmental health
- Water quality
- Environmental microbiology

### CAREER OPPORTUNITIES:

- Environmental consultant
- Environmental education
- Public service in science & policy
- Regulatory affairs (industry & government)
- Research scientist or technician

### CONTACT INFORMATION:

#### MES & PhD Program Coordinator:

Dr. Asim Biswas  
519-824-4120 ext 54249  
grdchair@uoguelph.ca

#### MSc Program Coordinator:

Dr. Youbin Zheng  
519-824-4120 ext 52741  
yzheng@uoguelph.ca

#### Graduate Program Assistant:

519-824-4120 ext 53937  
ses.gradsec@uoguelph.ca

## Departmental Graduate Faculty with Research Areas

**Genevieve Ali:** watershed sciences, hydrology-ecology interactions, precipitation-runoff modelling, landscape classification, environmental data science

**Madhur Anand:** global ecological change, sustainability science, forest ecology, ecological modelling, biodiversity

**Emmanuelle Arnaud:** glacial geology, geology and groundwater, sedimentary geology, environmental geology

**Asim Biswas:** soil physics, vadose zone hydrology, precision agriculture, proximal soil sensing, digital soil mapping, soil spatial variability

**Michael Dixon:** controlled environments, life support, space exploration

**Kari Dunfield:** environmental microbiology, microbial ecology, soil microbiology, bioremediation

**Adam Gillespie:** soil biochemistry, organic matter chemistry, soil health, carbon modelling, environmental spectroscopy, digital soil mapping

**Brandon Gilroyed:** anaerobic digestion; biorefinery; fermentation; industrial crops; waste valorization

**Susan Glasauer:** wetlands, biogeochemistry, metals, microbiology, soil chemistry

**Paul Goodwin:** ginseng, tobacco, soil, bacteria, fungi, molecular biology

**Jackie Goordial:** environmental microbiology, geomicrobiology, molecular ecology, bioinformatics, polar microbiology, climate change, astrobiology

**Tom Graham:** controlled environment agriculture, space biology, water remediation, food insecurity

**Ernesto Guzman:** bee biology, bee pathology, bee behaviour, bee genetics, bee ecology

**Marc Habash:** water quality, microbial source tracking, waterborne pathogens, microbial biofilms

**Bev Hale:** ecotoxicology, soil contaminants, soil remediation, metals, risk assessment

**Rebecca Hallett:** integrated pest management, biological control, invasive insect species, insect-plant interactions, insect population dynamics

**Richard Heck:** pedology, computed tomography, structure, magnetic susceptibility

**Tom Hsiang:** turfgrass diseases, forest pathology, fungal genomics

**Scott Krayenhoff:** urban climate modelling, adaptation, trees

**John Lauzon:** soil science, soil fertility, soil management, nutrient management

**James Longstaffe:** environmental chemistry, natural organic matter, soil and groundwater contamination, remediation, analytical instrumentation

**Jesse Popp:** Indigenous knowledge systems, wildlife ecology, two-eyed seeing

**Ryan Prosser:** mollusk biology, ecotoxicology, ecological risk assessment, aquatic toxicology, soil toxicology

**Nigel Raine:** pollinator conservation, pollinator behaviour, impacts of environmental stressors on bees, pollination ecology

**Neil Rooney:** food web stability, biodiversity, environmental assessment, aquaculture, agricultural effects

**Jonathan Schmidt:** insect sensory and hormonal physiology, biological control, Collembolan ecotoxicology, spiders in agroecosystems

**Cynthia Scott Dupree:** sustainable pest management, entomology, ecotoxicology

**Paul Sibley:** toxicology, ecology, water quality, risk assessment

**Naresh Thevathasan:** agroforestry, soil health, water quality, carbon sequestration

**Laura Van Eerd:** sustainable soil management, agriculture, cover crops, nitrogen biogeochemical cycling, soil health

**Paul Voroney:** soil organic matter stocks, soil carbon modeling, soil phosphorus availability

**Claudia Wagner Riddle:** soil-plant-atmosphere exchange, micro-meteorology, biogeochemical cycling

**Jon Warland:** agricultural meteorology, measurement and modelling of atmospheric turbulent transport, environmental instrumentation

**Andrew Young:** Insect diversity, diptera taxonomy and phylogenetics, native pollinators, community science, insect identification

**Youbin Zheng:** cannabis production, controlled environment agriculture, greenhouse production, environmental horticulture

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