

ONE HEALTH INSTITUTE

REPORT 2022 - 2023



UNIVERSITY
of GUELPH

ONE HEALTH INSTITUTE



One Health Institute (OHI)

The mission of the One Health Institute is to enhance and promote academic, research and outreach programs to propel the University of Guelph to the forefront of One Health scholarship internationally.

OHI Director

Dr. Cate Dewey

OHI Advisory Board Chair

Dr. Jeffrey Wichtel

OHI Advisory Board

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Jane Parmley (OVC)
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Grace Nichol (PhD Candidate, OVC)

What is One Health?

One Health is an integrated, unifying approach to balance and optimize the health of people, animals and the environment. It recognizes that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent.



Follow us on social media!

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WELCOME TO THE ONE HEALTH INSTITUTE



Dr. Cate Dewey | DVM, MSc, PhD
Professor | Department of Population Medicine
Director | One Health Institute

Director's Desk

It is a pleasure and an honor for me to feature some of the One Health work at the University of Guelph. Through this report, I hope you will appreciate the value of One Health research, finding real-world solutions to complex problems at the juncture of environmental, human, and animal health. At UofG we are building capacity in Canada through graduate and undergraduate programs. Meanwhile, the One Health Institute continues to build community across the campus, the country and the world, as well as actively engage in social media, symposia, host international dignitaries, and create new research teams.

FACULTY MEMBERS HIRED AS PART OF THE ONE HEALTH INITIATIVE 2020-2022



Quinn Webber

Assistant Professor

Department of
Integrative Biology

College of Biological Science

Dr. Quinn Webber is a behavioural ecologist working at the intersection between animals, parasites, and the environment. His research team studies how behaviour of caribou affect parasite and pathogen dynamics.

Despite their status as an iconic Canadian species, caribou populations are in decline throughout Canada. Anthropogenic disturbance, environmental degradation, and climate change are among the most important drivers of declines. Webber's work uses a One Health approach to tackle complex conservation problems, which he believes will help improve the resiliency of the caribou populations.



Diana Lewis

Assistant Professor

Department of Geography,
Environment & Geomatics

College of Social and Applied
Human Sciences

**Canada Research Chair in
Indigenous Environmental
Health Governance**

Dr. Diana Lewis is a member of the Sipekne'katik Mi'kmaq First Nation in Nova Scotia. She works to foster a wider understanding of Indigenous worldviews and how these worldviews inform environmental decisions. She is a strong advocate for Indigenous data sovereignty and Indigenous-led decision making.

Using a collaborative and transformative "One Health" approach to evaluate environmental, human and animal health and the widespread consequences of pollution, Dr. Lewis is currently working with Indigenous communities across Canada to develop an Indigenous-led environmental health risk assessment approach.



Heather Murphy

Associate Professor

Department of Pathobiology
Ontario Veterinary College

Canada Research

Dr. Heather Murphy's research focuses on understanding water and health challenges in developed and developing countries. Currently, she is heading a research project funded by the National Institutes of Health to understand the impact of drinking untreated private well water on children's health.

Dr. Murphy conservatively estimates that 1.4 million cases of acute gastrointestinal illnesses are attributable to consuming untreated water in North America. Her work will help identify vulnerabilities of groundwater water supplies due to land use (agriculture, housing developments), ageing/failing infrastructure, inadequate treatment, and extreme weather events. It will help inform policy decisions on the management of private wells in North America and globally.

Undergraduate Program

Bachelor of One Health

The University of Guelph welcomed 46 undergraduates to the inaugural Bachelor of One Health class in the fall of 2022. The Bachelor of One Health is the first four-year undergraduate degree devoted to One Health in Canada. Eight departments and four colleges participate in this transdisciplinary program. The program trains students to manage and help mitigate complex challenges, including transmission of zoonotic disease, anti-microbial resistance, rural community health, agricultural sustainability, food security and species at risk, as well as social determinants of health, policy, and environment.

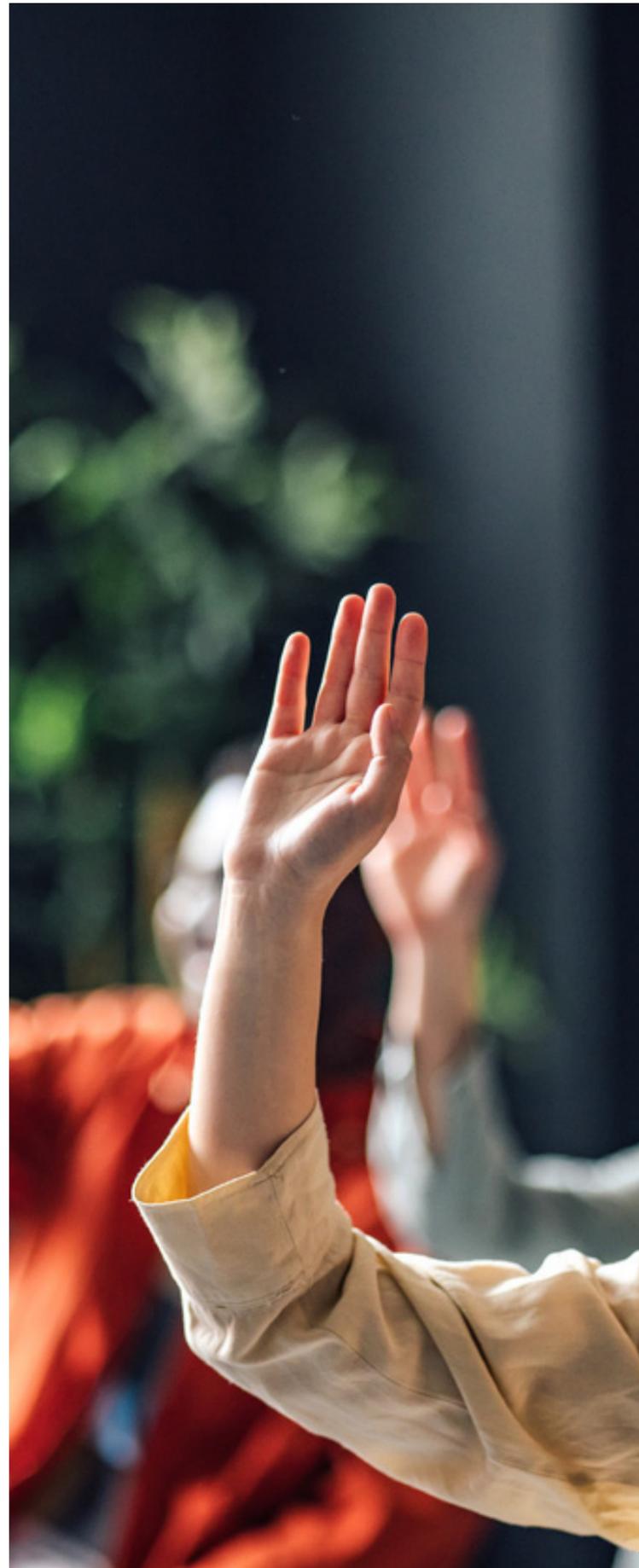
Graduate Programs

Collaborative Specialization in One Health (CSOH)

This Collaborative program facilitates graduate students conducting One Health research to become experts in their disciplinary program and practitioners of One Health, and prepares them to confront complex challenges at the confluence of human, animal and environmental health. A total of 39 students have enrolled in the CSOH, including the fall '22 cohort of 14 students from 5 colleges.

Doctor of Veterinary Medicine/Master of Public Health (DVM/MPH) Combined Degree Program

This combined program provides veterinary graduates with formal training in public health. Graduates are uniquely qualified to understand and respond to emerging zoonotic diseases, address global food system problems, and contribute to building resilient and healthy communities.



ONE HEALTH INSTITUTE SEMINAR SERIES

The [One Health Institute Seminar Series](#) showcases the depth and breadth of One Health research at the University of Guelph. These 50-minute talks feature a 30-minute presentation by U of G faculty. 30 faculty volunteered their time to give seminars as part of the series; all of which are recorded and available on the OHI YouTube channel.

SELECTED SEMINAR SPEAKERS



DAVID MA

Professor, Human Health & Nutritional Sciences, College of Biological Science

“There is One Health in all dimensions of family health.”

One Health Institute Seminar (February 8, 2023):

[ONGOING LEARNINGS FROM THE GUELPH FAMILY HEALTH STUDY AND ONE HEALTH PERSPECTIVES: INTERSECTION BETWEEN FAMILIES, ENVIRONMENT AND ANIMALS](#)

Dr. David Ma leads the Guelph Family Health Study (GFHS) alongside Drs. Mike Von Massow and Jess Haines. Recently, the GFHS looked at food intake and food waste among families enrolled in the GFHS. The U of G researchers found the average household throws out almost three kilograms of food each week. Those avoidable weekly losses equate to \$18, 3,366 calories worth of food energy and 23.3 kg of greenhouse gases generated to produce food that is ultimately discarded.

SELECTED SEMINAR SPEAKERS CONTINUED



KATIE CLOW

Assistant Professor in One Health,
Department of Population Medicine,
Ontario Veterinary College

“When dealing with ticks and tick-borne diseases, we need a One Health approach.”

One Health Institute Seminar (October 5, 2022):

TICKS, TICK-BORNE DISEASE, AND ONE HEALTH

Dr. Katie Clow's research focuses on the ecology and epidemiology of vector-borne zoonoses, like Lyme disease, which can be transmitted to humans by bites of infected blacklegged ticks. If left untreated, Lyme disease may result in persistent physical and neurological symptoms.

Dr. Clow advocates for a One Health approach in the monitoring and management of Lyme disease where, through ongoing information sharing, veterinary, medical, and public health professionals can work together to help increase overall awareness, reduce the risk of exposure to ticks and improve early diagnosis of Lyme disease.



PAUL SIBLEY

Professor, School of Environmental Sciences,
Ontario Agricultural College

“Sustainable agriculture explicitly recognizes that humans (food production, nutrition, economy, culture), environment, and animal welfare are intimately connected.”

One Health Institute Seminar (September 21, 2022):

ONE HEALTH ASPECTS OF HARMFUL ALGAL BLOOMS

Dr. Paul Sibley's research is designed to better understand the relative risks that environmental stressors may pose to the biota of aquatic and terrestrial ecosystems. Recently, Dr. Sibley's team has been looking at harmful algal blooms (HABs) – rapid, uncontrolled growth of algae that are toxic to humans, animals, and the environment.

Climate change has resulted in more sunny days, larger rainfall and runoff events, and warmer water, increasing the number and severity of harmful algal blooms. Nutrients found in fertilizers, pesticides, herbicides, and animal waste, such as nitrogen and phosphorus, help create perfect conditions for algae growth.

Dr. Sibley points out that as agricultural land use intensifies to feed a growing global population, HABs will continue to increase. He encourages the adoption of sustainable agricultural practices to help mitigate the effects of HABs on human, animal and environmental health.

ONE HEALTH RESEARCH & POSTER DAY

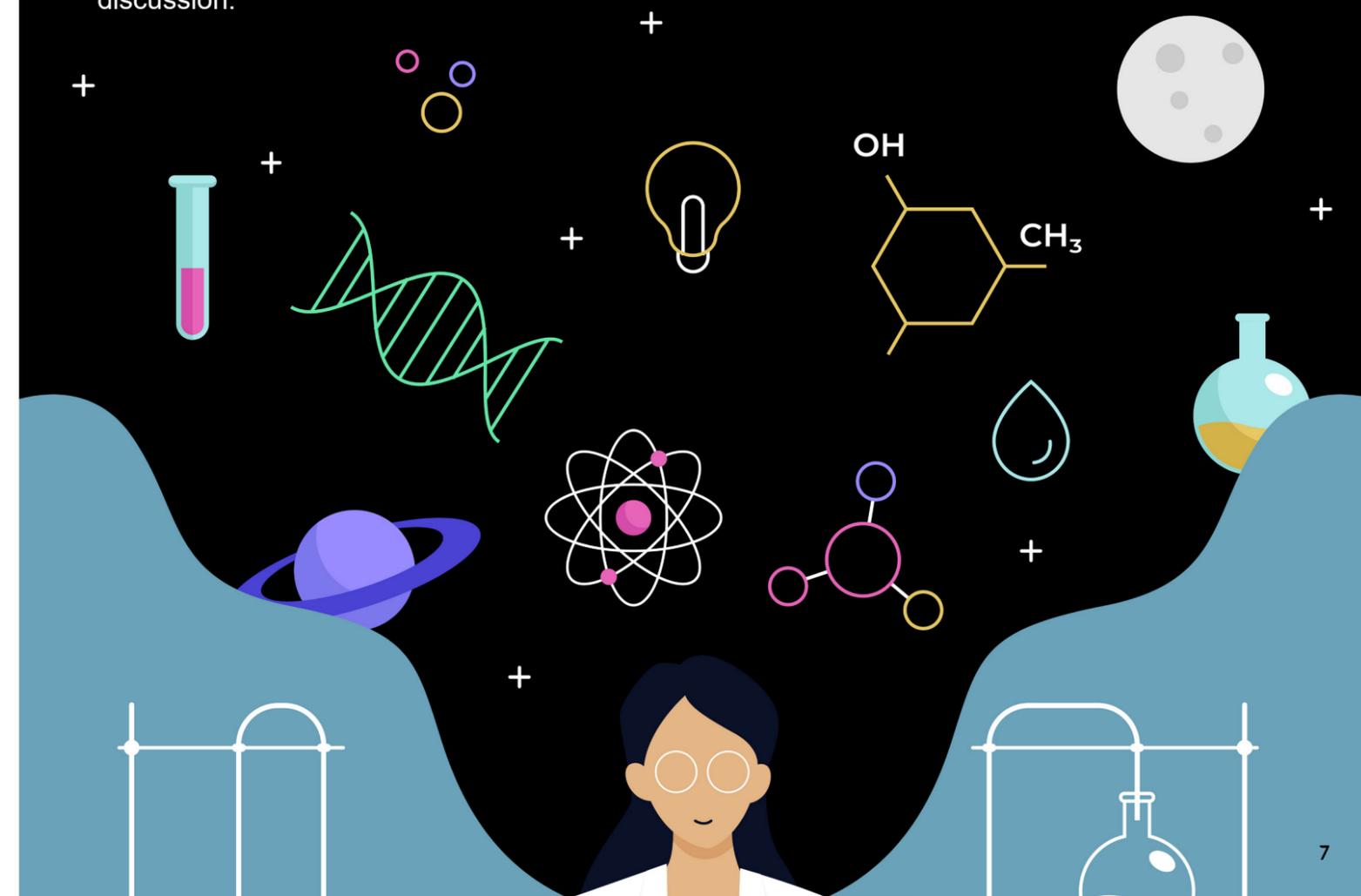
November 3, 2022

The One Health Institute and the One Health Student Committee, in collaboration with the Centre for Public Health and Zoonoses (CPHAZ) at the University of Guelph and the One Health Program in the Department of Pathology and Laboratory Medicine at the Schulich School of Medicine & Dentistry at Western University partnered to present One Health Research Day 2022, held in person.



One Health Research Day is an annual event where participants can interactively learn about One Health and its real-world applications across diverse fields and explore a cross-section of innovative and exciting research taking place at the interface of human, animal, and environmental health.

The 2022 event featured over 20 student research posters from U of G, Western University and McMaster University, an expert introduction to One Health from Dr. Cate Dewey, the Director of the One Health Institute, and a moderated three-person panel discussion.



ONE HEALTH RESEARCH & POSTER DAY - POSTER INSIGHTS

Role of the Environment in Antimicrobial Resistance Dissemination in Canada: A Scoping Review

Manuel Pérez Maldonado and Dr. Jane Parmley found a gap in the scholarly literature describing the presence and potential spread of Antimicrobial Resistance (AMR) in bioaerosols (small water droplets or solid particles containing biological material suspended in the air).

Pedagogical Approaches that Best Prepare Graduates to Address Climate Change and Other Urgent Health Threats

Radhika K. Gandhi, Dr. Jane Parmley and Dr. Katie Clow acknowledge that there is a need to identify pedagogical approaches that help facilitate the development of One Health core competencies. She is conducting semi-structured focus groups to identify student perspectives on such approaches to One Health courses and programs.

Wastewater-Based Epidemiology for the Characterization of Foodborne Pathogens Using a One Health Approach

Hailey Davidson and Dr. Lawrence Goodridge developed and tested a real-time wastewater surveillance tool for early-outbreak detection of foodborne illnesses. Foodborne pathogens Shiga-toxin E. coli (STEC), Salmonella spp., Listeria monocytogenes were found in some samples.

Social and Environmental Risk Factors for Canine Leptospirosis

Carys M. Vyn and Dr. Lauren Grant examined social and environmental risk factors (e.g. temperature, precipitation, rurality, socioeconomic status) for canine leptospirosis, a globally prevalent neglected zoonotic disease that affects almost all mammals.

ONE HEALTH AND DEVELOPMENT FOR A WORLD UNDER PRESSURE SYMPOSIUM | MAY 9-11, 2022

The One Health and Development for a World Under Pressure Symposium brought together scholars, researchers and practitioners working collaboratively on One Health or development challenges at the intersection of humans, animals, plants, and our shared environment.

In total, 141 individuals from North and South America, Europe, Asia, and Africa, gathered virtually and in person to discuss posters, presentations and panels organized around four themes: One Health and Global Public Health; Multispecies Health, Equity, and Justice; Policies and Governance for One Health and Development; Food, Water, Climate, and Health.

KEYNOTE SPEAKERS



Keith Sumption Chief Veterinary Officer of the Food and Agriculture Organization of the United Nations (CVO-FAO). Leader of the Animal Health Programme (NSAH). Chief of the Joint Centre for Zoonoses and antimicrobial resistance (AMR) (CJWZ).



John Amuasi Senior Lecturer at Ghana's Kwame Nkrumah University of Science and Technology (KNUST). Head of the Global Health Department of the School of Public Health. Co-Chair of the Lancet One Health Commission.



Helena Chapman Associate Program Manager for Health and Air Quality Applications in the Applied Sciences Program of the NASA Earth Science Division, Washington, D.C.



Thomas Gillespie Professor of Environmental Sciences and Environmental Health at Emory University, Atlanta, Georgia. Co-director of the Gombe Ecosystem Health Project in Tanzania in collaboration with the Jane Goodall Institute. Director of Infectious Disease Research at Centre Valbio in Madagascar. External expert to the UN High Level Political Forum on Sustainable Development. Member of the IUCN/SSC. National Geographic Explorer.



Phaedra Henley Assistant Professor and Chair of the Center for One Health at the University of Global Health Equity (UGHE), Rwanda.

ONE HEALTH AND DEVELOPMENT FOR A WORLD

UNDER PRESSURE SYMPOSIUM - POSTER INSIGHTS

North American Bats as a Potential Reservoir of Novel Viruses: Applying the One Health Approach to Assess Spillover Risk

Aleana Savage, from the Department of Veterinary Pathobiology at the University of Missouri-Columbia, and Dr. Giorgia Auteri looked to see what viruses exist among Missouri bats. Because bats are well-known hosts of several pathogenic viruses, and have the potential to emerge as a reservoir species for SARS-CoV-2, it is important to understand the pervasiveness of certain viruses in bat colonies. This knowledge will inform future conservation and public health decisions.

Environmental Contaminants' Effects on the Quality and Fertilization Capability of Bovine and Human Spermatazoa

Ola S. Davis and Dr. Laura Favetta in Biomedical Sciences at the University of Guelph, demonstrated that in vitro exposure to Bisphenol A (BPA) has a detrimental affect on sperm quality. This result may have relevance to human health, as human seminal fluid contains variable amounts of BPA.

A Multi-Omics Approach to Identify the Host-Pathogen-Environment Factors Associated with Streptococcus Suis Disease Development in Swine

PhD candidate Maysa Niazy and Dr. Nicole Ricker in the Department of Pathobiology at the University of Guelph, looked at *Streptococcus suis* (*S. suis*), a swine pathogen that has zoonotic potential. Her study characterized the tonsillar microbial communities of healthy pigs and pigs with *S. suis*. She integrated this microbiome data with *S. suis* whole genome sequencing and single nucleotide variant data to explore the association between tonsil micro-biota and *S. suis* disease.

CANADIAN SCIENCE POLICY CONFERENCE

In 2021 and 2022, The University of Guelph organized panel discussions as part of the annual Canadian Science Policy Conference (CSPC). The conference is among the most comprehensive global science and innovation policy forums, and the largest gathering of members of the Canadian science policy community. The Conference is organized by the Canadian Science Policy Centre, a non-profit, non-partisan, and non-advocate organization, with a mission to build a strong and inclusive science policy community that contributes to the well-being of Canadians. Since its founding in 2009, the Centre has built Canada's largest and most diverse science and policy innovation community.

14th Canadian Science Policy Conference (2022)

Under the overarching theme: Navigating Uncertainty; Targeting Sustainability, the 14th annual CSPC focused on the most pressing issues of science and innovation and the crucial role they play in building more resilient society. The University of Guelph organized a panel discussion, entitled: **One Health in a Time of Pandemics: How It Can Future-Proof Our Health Systems and Economy from Future Disease Emergencies.**

Moderator

Malcolm Campbell | Vice President (Research),
University of Guelph

Panelists

Michele Anholt | Senior Specialist,
One Health at UCalgary
Department of VP Research,
University of Calgary

Hélène Carabin | Co-Director,
Global One Health Network,
Professor and Canada Research Chair
in Epidemiology and One Health,
Université de Montréal

Arinjay Banerjee | Principal Investigator,
Vaccine and Infectious Disease Organization
Co-Lead - One Health Signature Area,
University of Saskatchewan

Jane Parmley | Associate Professor,
Department of Population Medicine,
Ontario Veterinary College,
University of Guelph

ONE HEALTH INSTITUTE AWARDS

UNDERGRADUATE AWARDS

The One Health Institute offers financial support for four undergraduate or DVM students to actively engage in One Health research projects: [the Robert W. Woolner Undergraduate Summer Research Studentship](#) in One Health (two awards), [the International Summer Studentship in One Health](#), and an experience at two universities: [the University of Guelph & McMaster University | Undergraduate Summer Research Studentship](#).

Since 2019, the One Health Institute has supported experiential research opportunities in One Health for 11 undergraduates.

Zoonotic Disease Risk Factors Associated with Non-Human Primate/Human Interaction in a Captive Setting



Raquel Archie, Summer 2021/2022
Woolner Studentship
Undergraduate Recipient

Because of their evolutionary relatedness, non-human primates and humans share many infectious diseases.

When humans and non-human primates interact there is the potential for zoonotic/reverse zoonotic disease transfer.

Travis Steffens, an Assistant Professor in the Department of Sociology and Anthropology, is exploring this nexus in the context of zoos, where non-human primates, humans, and other animals all interact in a shared space. Raquel Archie, an upper year Bachelor of Arts student, examined potential risk factors for reverse zoonotic pathogen transmission (human to animal) in the Toronto Zoo's lemur population.

Her study yielded recommendations to the Toronto Zoo on food storage, handling and pest control to mitigate transmission risk.

GRADUATE AWARDS

Understanding anthroponotic transmission of SARS-CoV-2 to domestic and wild animals

Lawrence Goodridge
Leung Family Professor in Food Safety
Director | Canadian Research Institute for Food Safety
University of Guelph



In 2021, the One Health Institute established two awards to support graduate students enrolling in thesis-based Masters, PhD or DVSc programs at the University of Guelph.

The Social Sciences and Humanities for One Health award aimed to stimulate collaborative, interdisciplinary research including a social scientist and a faculty member from another college. [The One Health | U of G Partnership Award](#) encourages collaboration between faculty from the University of Guelph and either McMaster University or the University of Western Ontario. In 2022, the One Health Institute supported opportunities for four graduate students through these awards.

The DVM/MPH program is available to new OVC DVM graduates who completed elective One Health courses during their DVM training.

Up to five students per year are accepted into the MPH accelerated program that will be completed in one year. The One Health Institute offers students accepted to the DVM/MPH program an annual stipend of \$25,000.

Dr. Lawrence Goodridge, Leung Family Professor in Food Safety and Director of the Canadian Research Institute for Food Safety, received support from [the U of G Partnership Award](#). He recruited a graduate student to conduct genomic-based surveillance of SARS-CoV-2 in domesticated and wild animal populations that live in close contact with humans.

Dr. Goodridge's work in this area is important because, while much research has focused on animal to human (zoonotic) transmission of the virus, little is known about human to animal (anthroponotic) transmission.

Frequent spillover/spillback transmission of the virus between humans and animals can lead to infections across interspecies barriers and potential subsequent re-infection of humans with deadlier mutants, and the potential for new viruses and diseases to emerge.



OUTREACH

Through broad collaboration, the One Health Institute is strategically building the capacity of UofG and its academic, private, and governmental partners to help solve pressing One Health problems of local, national and global importance.

The One Health Institute regularly participates in external outreach activities, examples including:

- The G7 Research Summit on One Health in Lake Louise, Alberta on November 21-23, 2022. U of G One Health faculty contributed to discussions focused around a One Health approach to climate change and biodiversity loss, mitigating a planet in crisis, and learning from Indigenous relationships with the natural world.
- The WAHL Show, a well-known wellness and healthy lifestyle podcast hosted by Dr. Mike Wahl, Professor of Clinical Anatomy in the Faculty of Medicine from Memorial University of Newfoundland.
- One World One Health podcast.

- Membership in the Canadian Association of Global Health Research. One Health faculty participated in the annual University Advisory Council Workshop.
- Hosting delegations interested in learning about One Health and the One Health Institute. In 2022, the University of Guelph hosted individuals from the Brazilian Agricultural Research Corporation (Embrapa), faculty and students from Mississippi State University (MSU) and a delegation from the French embassy in Canada.

Global Affairs Canada (GAC) invited a limited number of organizations, including the University of Guelph, to apply for \$20 million in funding to develop community-level One Health projects in Sub-Saharan Africa. The University of Guelph is a partner or signatory on each of the four successful applications and will work alongside Université de Montréal - École de santé publique / Faculté de médecine vétérinaire, University of Saskatchewan, Veterinarians Without Borders, and Alinea International.

Over 4,000 people follow the OHI Twitter account (@OneHealthUofG), one of the largest Twitter audiences at the University of Guelph.

The [OHI LinkedIn](#) page promotes One Health academic programming, seminars, events, and One Health affiliated faculty research at UofG.

Currently, the LinkedIn page is followed by nearly 2,000 individuals, including 25% from higher education, 10% from veterinary services, 9% from research services, 5% from non-profit organizations, and 4% from government administration.

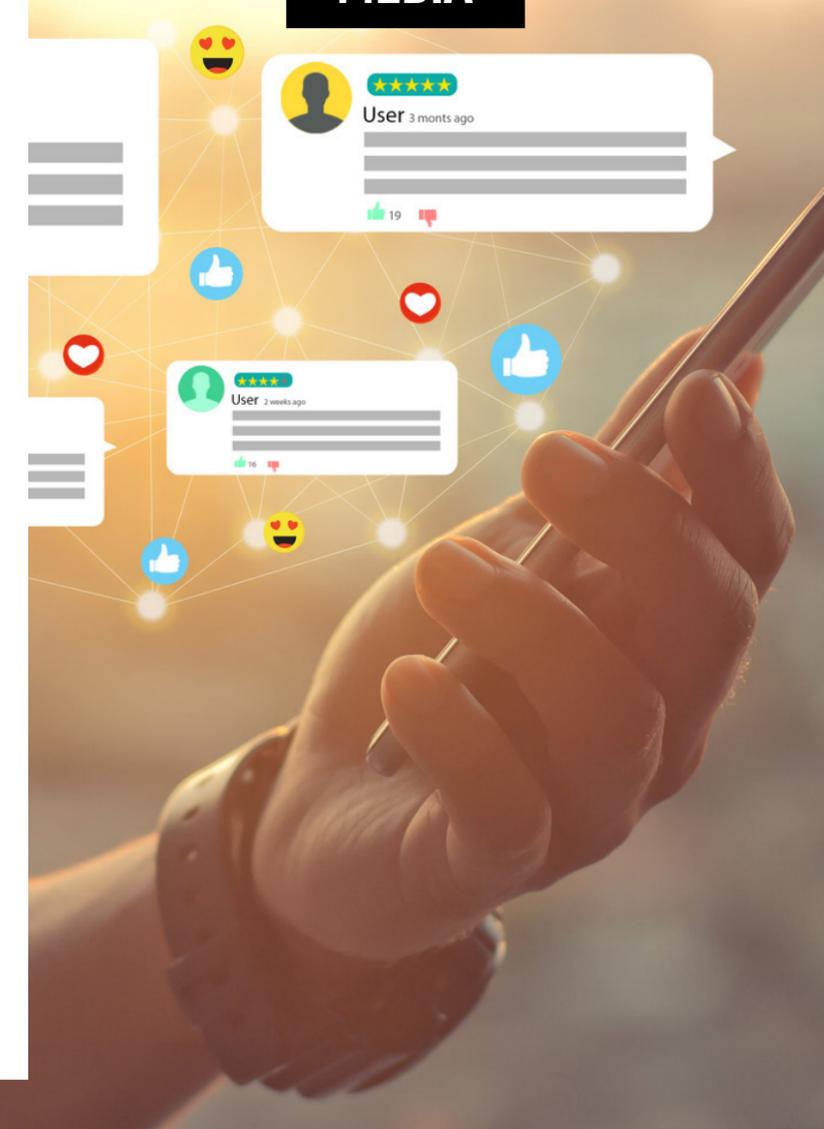
The [OHI Instagram](#) account was launched in June 2022. Currently, more than 700 individuals follow OHI on this platform, making it a key social media channel for connecting the One Health Institute with the student body.

The [OHI biweekly newsletter](#) provides updates on One Health opportunities, events, faculty and One Health research at the University of Guelph to an audience of over 1,000 subscribers.

In a typical month, 1,500-3,000 users access the [OHI website](#), which provides information about scholarships, studentships, newsletters, academic programming, One Health affiliated faculty, seminars, and upcoming events.

COMMUNICATIONS & SOCIAL

MEDIA



One Health U of G
@onehealthuofg907 146 subscribers 88 videos
As a world-class comprehensive and research-intensive university, we are ...

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- OHI Seminar Series | Dr Quinn Webber | March 29... 56 views • 2 months ago
- OHI Seminar Series | Dr David Ma | Feb 8 2023 83 views • 4 months ago
- Woolner Studentship Summer 2022 - Dr. Andrea... 57 views • 5 months ago
- Woolner Studentship Summer 2022 - Dr. Travis... 49 views • 6 months ago

One Health - U of Guelph Retweeted
University of Guelph News @UofGuelphNews · May 15
Ticks have become a year-round problem, @OntVetCollege veterinary infectious disease researcher Dr. Scott Weese (@weese.scott) tells the @WR_Record.
"We're pretty much a 12-month tick season now."
@OneHealthUofG @cphaz

therecord.com
Ontario's tick season worsening as winters get warmer
"We're pretty much a 12-month tick season now," says Guelph researcher

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ONE HEALTH INSTITUTE REPORT 2022-2023

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Cate Dewey and Jeffrey Wichtel

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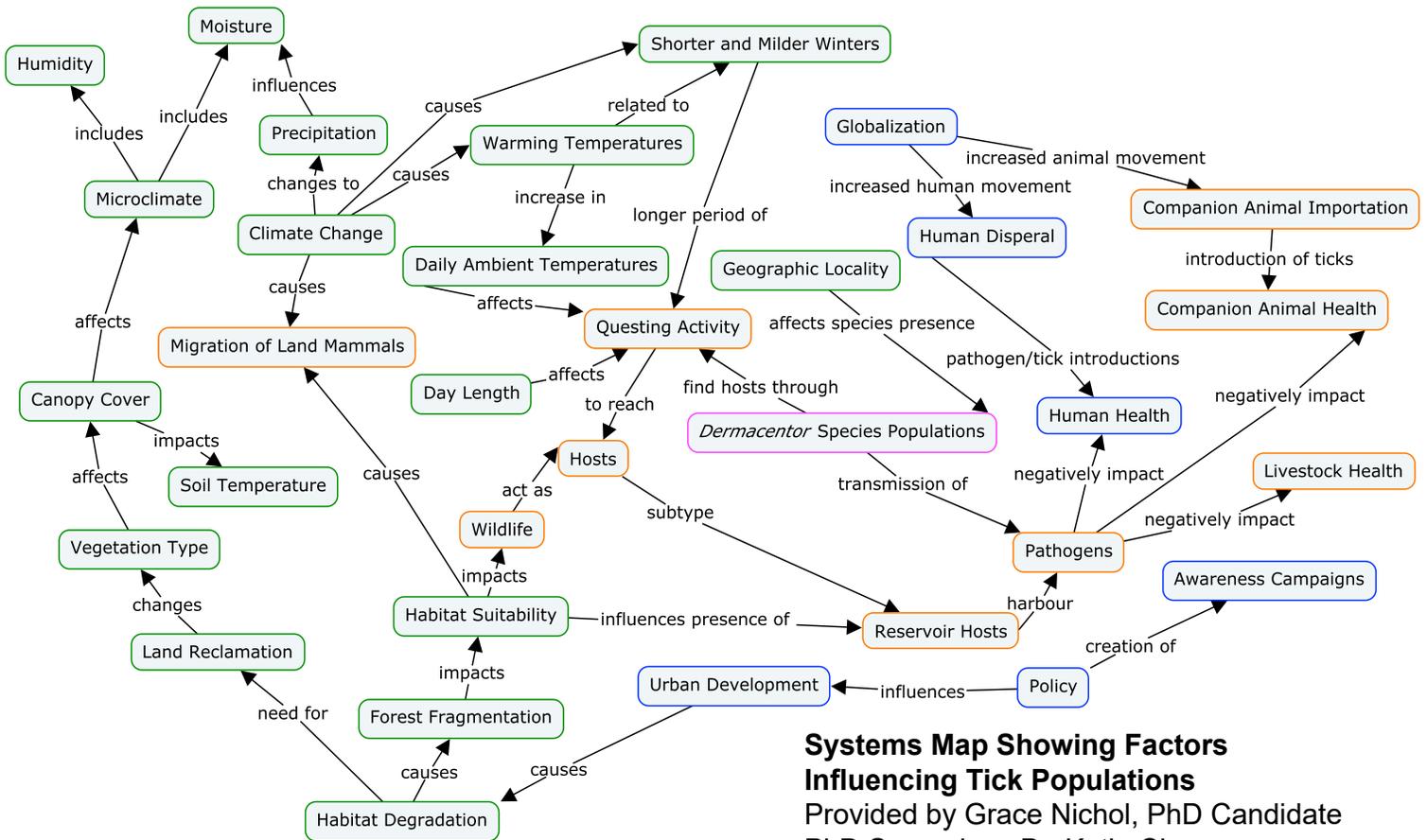
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Systems Map Showing Factors Influencing Tick Populations

Provided by Grace Nichol, PhD Candidate
 PhD Supervisor, Dr. Katie Clow
 Department of Population Medicine
 Ontario Veterinary College



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