

# Kristin M. Eccles

# Curriculum Vitae

## CONTACT INFORMATION

Exposure and Biomonitoring Division  
Health Canada  
251 Sir Frederick Banting Driveway  
Sir Frederick Banting Building  
Ottawa, ON, K1A 0K9

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## HIGHLIGHTS

25 peer-reviewed publications (10 as first author)  
387 citations; h index = 10 and i10 index = 10  
Research interests: Mixtures, Exposome, Biomarkers, NAMs, AEP-AOP

## CURRENT POSITION

### Research Scientist

July 2023 - Present

Principle Investigator, Computational Toxicology Research Group  
Exposure and Biomonitoring Division, Health Canada  
Ottawa, Ontario, Canada

## EDUCATION

### Ph.D., Biology with Specialization in Chemical and Environmental Toxicology 2019

Department of Biology, University of Ottawa, Ottawa, Canada  
Adviser: Laurie Chan, Ph.D.

### M.Sc., Geography

2014

Department of Geography, University of Calgary, Calgary, Canada  
Advisers: Stefania Bertazzon, Ph.D. and Sylvia Checkley, Ph.D.

### Honours B.A., Health Studies, Minors: Geography and Earth Science

2012

McMaster University, Hamilton, Canada  
Adviser: John Eyles, Ph.D.

## PROFESSIONAL APPOINTMENT/ EMPLOYMENT

### Postdoctoral Research Fellow

Nov 2020 - May 2023

National Institute of Environmental Health Science, Division of Translational Toxicology,  
Durham, North Carolina, USA  
Advisers: Cynthia Rider, Ph.D and Kyle Messier, Ph.D.

### Postdoctoral Fellowship

Aug 2019 - Oct 2020

Department of Geography, Geomatics and Environment, University of Toronto, Mississauga, Canada  
Advisers: Igor Lehnher, Ph.D. and Trevor Porter, Ph.D.

### Geomatics Researcher

June 2017 - March 2019

National Wildlife Researcher Center, Environment and Climate Change Canada, Ottawa, Canada

## PEER-REVIEWED PUBLICATIONS

**Eccles, K.M.**, Boutet, V. Branigan, M., Dyck, M., van Coeverden de Groot, P., Lougheed, S.C., Rutter A., Langlois V.S. Non-invasive biomonitoring of polar bear feces can be used to estimate concentrations of heavy metals of concern in traditional food (2024). *Under revision*.

Stalwick, J., Somers, G., **Eccles K.M.**, Thomas, P.J., Cunada, C., Gurney, K. (2024). The Influence of Environmental Factors such as Snow and Fire on Spatial and Temporal Patterns of Polycyclic

Aromatic Compounds in the Mackenzie. *Environmental Pollution*, 123962. <https://doi.org/10.1016/j.envpol.2024.123962>

Cheney, C.L., **Eccles K.M.**, Lehnher, I., Blais, J. M. (2024). Mercury deposition to lake sediments near historic gold mines in northern Canada. *Environmental Pollution*, 123038. <https://doi.org/10.1016/j.envpol.2023.123038>

Vander Meulen, I. J., Schock, D. M., Akhter, F., Mundy, L. J., **Eccles K.M.**, Soos, C., Peru, K.M., McMartin, D.W., Headley, J.V. and Pauli, B.D. (2023). Site-specific spatiotemporal occurrence and molecular congener distributions of naphthenic acids in Athabasca oil sands wetlands of Alberta, Canada. *Environmental Pollution*, 122061. <https://doi.org/10.1016/j.envpol.2023.122061>

Tommasi, F., Pagano, G., Oral, R., Thomas, P.J., **Eccles K.M.**, Tez, S., Toscanesi, M., Giarra, A., Siciliano, A., Dipierro, N., Gjata, I., Guida, M., Libralato, G., Lyons, D.M., Buri, P., Ines Kovai, I., Trifuoggi, M. (2023). Topsoil pollution and multi-endpoint toxicity in the petrochemical area of Augusta-Priolo (eastern Sicily, Italy). *Chemosphere*, 333, 138802. <https://doi.org/10.1016/j.chemosphere.2023.138802>

**Eccles K.M.**, Karmaus, A. L., Kleinstreuer, N. C., Parham, F., Rider, C. V., Wambaugh, J. F., Messier, K. P. (2023). A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target. *Science of The Total Environment*, 855, 158905. <https://doi.org/10.1016/j.scitotenv.2022.158905>

\*NIEHS 2022 paper of the year

Boutet, V., Dominique, M., **Eccles, K.M.**, Branigan, M., Dyck, M., van Coeverden de Groot, P., Loughheed, S.C., Rutter A., Langlois V.S. An exploratory spatial contaminant assessment for polar bear (*Ursus maritimus*) liver, fat, and muscle from Northern Canada. (2023). *Environmental Pollution*, 316, 120663. <https://doi.org/10.1016/j.envpol.2022.120663>

Lowe, M.E., Akhtari, F., Potter, P.A., Fargo, D.C., Schmitt, C.P., Schurman, S.H., **Eccles, K.M.**, Motsinger-Reif, A., Hall, J.E., Messier, K.P. (2022). The skin is no barrier to mixtures: Air pollutant mixtures and reported psoriasis or eczema in the Personalized Environment and Genes Study (PEGS). *Journal of exposure science & environmental epidemiology*.1-8. <https://doi.org/10.1038/s41370-022-00502-0>

Cui, Y., **Eccles K.M.**, Kwok, R.K., Joubert, B., Messier, K.P., Balshaw, D. (2022). Integrating Multiscale Geospatial Environmental Data into Large Population Health Studies: Challenges and Opportunities. *Toxics*. 10(403). <https://doi.org/10.3390/toxics1007040>

Thomas, P. J., Eickmeyer, D. C., **Eccles, K.M.**, Kimpe, L. E., Felzel, E., Brouwer, A., Blais, J. M. (2022). Paleotoxicity of petrogenic and pyrogenic hydrocarbon mixtures in sediment cores from the Athabasca oil sands region, Alberta (Canada). *Environmental Pollution*, 292, 118271. <https://doi.org/10.1016/j.envpol.2021.118271>

**Eccles, K.M.**, Thomas, P. J., Chan, H. M. (2021). Spatial patterns of the exposure-response relationship between mercury and cortisol in the fur of river otter (*Lontra canadensis*). *Chemosphere*, 263, 127992. <https://doi.org/10.1016/j.chemosphere.2020.127992>

Thomas, P. J., Newell, E. E., **Eccles, K.M.**, Holloway, A. C., Idowu, I., Xia, Z., Quenneville, C. (2021). Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (*Lontra canadensis*) baculum. *Chemosphere*, 265, 128920. <https://doi.org/10.1016/j.chemosphere.2020.128920>

**Eccles, K.M.**, Pauli, B.D., Chan, H.M. (2020). Geospatial analysis of complex metal exposures

to biota in the Athabasca Oil Sands. *PLoS one*, 15(9), e0239086. <https://doi.org/10.1371/journal.pone.0239086>

Galen, G., **Eccles, K.M.**, MacMillian, M., Thomas, P. J., Chan, H.M., Poulain, A.J. (2020). The gut microbial community structure of the North American river otter (*Lontra canadensis*) in the Alberta Oil Sands Region in Canada: relationship with local environmental variables and metal body burden. *Environmental Toxicology and Chemistry*.39(12), 2516-2526. <https://doi.org/10.1002/etc.4876>

Etowa, J., Johnston, A., Jama, Z., **Eccles, K.M.**, Ashton, A. (2020). Mixed-method evaluation of a community-based postpartum support program: a study protocol. *BMJ open*, 10(10), e036749. <https://doi.org/10.1136/bmjopen-2019-036749>

**Eccles, K.M.**, Majeed, H., Lehnher, I., Porter, T. (2020). A continental and marine-influenced tree-ring mercury record in the Old Crow Flats, Yukon, Canada. *ACS Earth and Space Chemistry*, 4(8), 1281-1290. <https://doi.org/10.1021/acsearthspacechem.0c00081.s001>

Cheney, C.L., **Eccles, K.M.**, Kimpe, L.E., Blais, J.M. (2020). Determining the effects of past gold mining using a sediment palaeotoxicity model. *Science of The Total Environment*, 718, 137308. <https://doi.org/10.1016/j.scitotenv.2020.137308>

**Eccles, K.M.**, Thomas, P. J., Chan, H. M. (2020). Relationships between mercury concentrations in fur and stomach contents of river otter (*Lontra canadensis*) and mink (*Neovison vison*) in northern Alberta Canada and their applications as proxies for environmental factors determining mercury bioavailability. *Environmental Research*, 181, 108961. <https://doi.org/10.1016/j.envres.2019.108961>

**Eccles, K. M.**, Pauli, B. D., Chan, H. M. (2019). The use of Geographic Information Systems (GIS) for spatial ecological risk assessments: An example from the Athabasca oil sands area in Canada. *Environmental toxicology and chemistry*, 38(12): 27972810. <https://doi.org/10.1002/etc.4577>

**Eccles, K. M.**, Littlewood, E. S., Thomas, P. J., Chan, H. M. (2019). Distribution of organic and inorganic mercury across the pelts of Canadian river otter (*Lontra canadensis*). *Scientific reports*, 9(1), 3237. <https://doi.org/10.1038/s41598-019-39893-w>

**Eccles, K. M.**, Thomas, P. J., Chan, H. M. (2017). Predictive meta-regressions relating mercury tissue concentrations of freshwater piscivorous mammals. *Environmental Toxicology and Chemistry*, 36(6), 23772384. <http://doi.org/10.1002/etc.3775>

Thomas, P. J., **Eccles, K. M.**, Mundy, L. J. (2017). Spatial modelling of non-target exposure to anticoagulant rodenticides can inform mitigation options in two boreal predators inhabiting areas with intensive oil and gas development. *Biological Conservation*, 212, 111-119. <https://doi.org/10.1002/etc.3775>

Hu, X. F., **Eccles, K. M.**, Chan, H. M. (2017). High selenium exposure lowers the odds ratios for hypertension, stroke, and myocardial infarction associated with mercury exposure among Inuit in Canada. *Environment International*, 102, 200-206. <https://doi.org/10.1016/j.envint.2017.03.002>

**Eccles, K. M.**, Checkley, S., Sjogren, D., Barkema, H. W., Bertazzon, S. (2017). Lessons learned from the 2013 Calgary flood: Assessing risk of drinking water well contamination. *Applied Geography*, 80, 78-85. <https://doi.org/10.1016/j.apgeog.2017.02.005>

**Eccles, K.M.**, Bertazzon, S. (2015). Applications of geographic information systems in public health: A geospatial approach to analyzing MMR immunization uptake in Alberta. *Canadian Journal of Public Health*, 106(6). <https://doi.org/10.17269/cjph.106.4981>

Bertazzon, S., Johnson, M., **Eccles, K.**, Kaplan, G. G. (2015). Accounting for spatial effects in land use regression for urban air pollution modelling. *Spatial and Spatio-temporal Epidemiology*. 14-15, 921. <https://doi.org/10.1016/j.sste.2015.06.002>

#### TECHNICAL REPORTS

AMAP, 2021. AMAP Assessment 2021: Mercury in the Arctic. Arctic Monitoring and Assessment Programme (AMAP), Troms, Norway. 324 pp

\*Contributing author to Chapter 2: Temporal trends of mercury in Arctic media

#### INVITED TALKS

9. **Eccles K.M.**(2024). Unraveling the Complexity: Component-based approaches to quantify the effects of exposure to PFAS Mixtures. Center for PFAS and Cancer (CPAC) Joint Virtual Symposium. Georgetown University. Washington, DC, USA.
8. **Eccles K.M.**(2024). Mapping Metal Mixtures: Using Wildlife as Sentinels for Human Health. Society of Toxicology Annual Meeting. Salt Lake City, USA.
7. **Eccles K.M.**(2024). Geospatial and Computational Approaches to Support the Risk Assessment of Chemical Mixtures within an AEP-AOP Framework. Salt Lake City, USA.
6. **Eccles K.M.**(2023). From Molecules to Maps: Assessing spatial patterns of contaminant sources, exposures, and health effects on humans and wildlife. Health Canada. Ottawa, Canada.
5. **Eccles K.M.**(2022). From Molecules to Maps: Assessing spatial patterns of contaminant sources, exposures, and health effects on humans and wildlife. Rutgers University. Newark, New Jersey, USA.
4. **Eccles K.M.**(2020). From biomarkers to biomes: Relationships between contaminant sources, exposures, and health outcomes. University of Toronto Intersectional Seminar Series. Toronto, Canada.
3. **Eccles K.M.**(2020). Humans, wildlife, and the environment: Assessing ecological health. 2nd Annual GeoHealth Network Conference. Toronto, Canada. (Cancelled due to COVID-19)
2. **Eccles K.M.**, Chan H.M. (2018). Mercury in wild foods and food security: Integrating data (Presentation). Environment and Climate Change Canada (ECCC) Wildlife Division Health Division Annual Meeting. Ottawa, Canada.
1. **Eccles K.M.**, Chan H.M. (2018). Modelling the relationship between contaminant sources and exposures in wildlife (Presentation). Environment and Climate Change Canada (ECCC) National Pollution Release Inventory (NPRI) Data Users Workshop. Ottawa, Canada.

#### SELECTED CONFERENCE PRESENTATIONS (12/25)

**Eccles K.M.**, Blais, A., Zhang, G., Girgis, A., Pelletier, G., Aranda-Rodriguez, R., Tayabali, A. (2024). Putting the 3Rs into action: a coupled *in silico*, *in vitro*, and *in vivo* study to quantify immunological effects of per- and poly-fluoroalkyl substances (PFAS) (Poster). Society of Toxicology, Salt Lake City, USA.

**Eccles K.M.**, Karmaus, A. L., Kleinstreuer, N. C., Parham, F., Rider, C. V., Messier, K. P. (2023). Mapping a Path to Disease: Quantifying the risk of exposure to environmental chemical mixtures via a common molecular target using a geospatial modeling approach (Presentation). Society of Toxicology, Nashville, USA.

\*1st place winner of best postdoctoral abstract for the SOT Mixtures specialty section

**Eccles K.M.**, Rider, C. V., Messier, K. P. (2022). Geospatial Risk Assessment Using High-Throughput Screening Assays To Quantify Potential Adverse Effects From Exposure To Chemical Mixtures (Presentation). Society of Environmental Toxicology and Chemistry, Pittsburgh, USA.

**Eccles K.M.**, Karmaus, A. L., Kleinstreuer, N. C., Parham, F., Rider, C. V., Wambaugh, J. F., Messier, K. P. (2022). A geospatial modeling approach to quantifying the risk of exposure to environmental chemical mixtures via a common molecular target (Poster). North Carolina Society of Toxicology, Durham, USA.

\*1st place winner of best postdoctoral poster and presentation

**Eccles K.M.**, Messier, K.P. (2021). Geospatial Risk Characterization Mapping of Chemical Mixtures Through Connections to Toxicological Adverse Outcome Pathways (Presentation). American Geophysical Union, New Orleans, USA.

**Eccles K.M.**, Kleinstreuer, N.C., Wambaugh, J.F., Messier, K.P. (2021). A geospatial modeling approach to quantifying risk of exposure to environmental chemical mixtures via a common molecular initiating event (Poster). International Society of Environmental Epidemiology, New York, USA.

**Eccles K.M.**, Clackett A., Ghotra, A., Majeed, I., Lehnher, I., Porter, T. (2020). Developing a network of historical atmospheric mercury trends using tree-rings in northern Canada (Presentation). Society of Environmental Toxicology and Chemistry, Fort Worth, USA.

**Eccles K.M.**, Clackett A., Ghotra, A., Majeed, I., Lehnher, I., Porter, T. (2019). Assessing variability of atmospheric mercury ( $Hg^0$ ) trends using tree-rings in northern Canada (Presentation). Society of Environmental Toxicology and Chemistry. Toronto, Canada.

**Eccles K.M.**, Thomas P.J., Chan H.M. (2019). Wildlife as a surrogate indicator for impacts of mercury on ecosystem health (Presentation). International Conference on Mercury as a Global Pollutant. Krakow, Poland.

**Eccles K.M.**, Thomas P.J., Chan H.M. (2018). Wildlife as a surrogate indicator for impacts of mercury on ecosystem health (Presentation). Society of Environmental Toxicology and Chemistry. Sacramento, USA.

**Eccles K.M.**, Thomas P.J., Chan H.M. (2018). Evaluating the co-dispersion of mercury sources and wildlife exposures in the Athabasca Oil Sands region (Presentation). Society of Environmental Toxicology and Chemistry. Sacramento, USA.

**Eccles, K.M.**, Hebert C.E., Schock, D., Akhter F., Mundy L., Thomas P.J., Pauli, B.D. (2018). Evaluating the co-dispersion of mercury sources and wildlife exposures in the Athabasca Oil Sands region (Presentation). Society of Environmental Toxicology and Chemistry. Sacramento, USA.

## MEDIA

### SOT TV 2024

Innovation Uncaged: from lab to screen in chemical hazard assessment [YouTube Link]

The Next Frontier in Toxicology: Computational and Geospatial Methods in Toxicology Research [YouTube Link to full video] [YouTube Link to segment]

## TEACHING EXPERIENCE

### Primary Instructor

Lecture and lab: High-throughput screening (ToxCast and Tox21 program) and high-content data sources (3 hours)

**Winter 2024**

BIM4103 Selected Topics in Biomedical Science, University of Ottawa

Teaching Material: <https://github.com/kristineeccles/BIM4103-HTS-Dose-Response>

Graduate Level Short Course: Introduction to R in Open-Source Methods (6 hours) **Winter 2020**  
Department of Geography, Geomatics and Environment, University of Toronto **Fall 2020**

Teaching Material: [https://github.com/kristineccles/Introduction\\_to\\_R](https://github.com/kristineccles/Introduction_to_R)

Geographic Information Systems **Spring 2020**  
Department of Geography, Geomatics and Environment, University of Toronto

Introduction to Quantitative Methods **Winter 2018**  
Department of Geography and Environmental Studies, Carleton University  
Teaching Material: [https://github.com/kristineccles/introduction\\_to\\_stats](https://github.com/kristineccles/introduction_to_stats)

Mapping and Modelling the Real World: Introduction to GIS **May 2017**  
Enrichment Mini-Course, University of Ottawa

Introduction to Geomatics **Fall 2016**  
Department of Geography, Environment and Geomatics, University of Ottawa

**Teaching Assistant**  
University of Ottawa, Ottawa, ON **2014 - 2017**  
Spatial Ecology, Biostatistics, Environmental Science

#### COMPETITIVE AWARDS

Society of Toxicology (SOT) Mixtures Specialty Section  
Best Postdoctoral Abstract (2023) **\$1000**  
Society of Toxicology (SOT) Biological Modeling Specialty Section  
Andersen-Clewell Trainee Award - 2nd Place (2023) **Recognition**  
NIEHS Paper of the Year (2022) **Recognition**  
North Carolina Society of Toxicology (NCSOT)  
Best Postdoctoral Poster and Presentation (2022) **\$300**  
SETAC Travel Award (2022) **\$1050**  
University of Toronto Postdoctoral Award (2019-2020) **\$45,000**  
NSERC CREATE-REACT (2016 - 2018) **\$20,000**  
NSERC CREATE-REACT Travel Award (2018) **\$5,000**  
University of Ottawa Excellence Scholarship (2016 - 2017) **\$8,200**  
Queen Elizabeth II Graduate Scholarship in Science and Technology (2016 - 2017) **\$15,000**  
University of Ottawa Entrance Scholarship (2014 - 2018) **\$38,000**

#### LEADERSHIP AND SERVICE

**Board Member**  
Society of Toxicology Lake Ontario Regional Chapter **2024 - Present**  
Ann Manor Board **2023 - Present**  
Society of Toxicology Mixtures Specialty Section **2023 - 2024**

#### Conference Sessions/Workshops Organized

Society of Toxicology, Salt Lake City, USA **March 2024**  
Workshop Session: Integrating Aggregate Exposure Pathways and Adverse Outcome Pathways for Comprehensive Risk Assessment of Chemical Mixtures

Society of Environmental Toxicology and Chemistry, Fort Worth, USA **Nov 2020**  
On Demand Session: Mercury emissions, transport, and transformation in a changing environment  
Live Discussion: Pathways between Hg sources and exposures in a changing world

Workshop: Introduction to R Course Material: [https://github.com/kristineccles/setac\\_intro\\_to\\_r\\_](https://github.com/kristineccles/setac_intro_to_r_)

2020

International Conference on Mercury as a Global Pollutant, Krakow, Poland  
Workshop: Latest Advances in Wildlife Biomonitoring

**Sept 2019**

**Expert Working Group Member**

Arctic Monitoring Assessment Program (AMAP)  
Mercury Expert Working Group

**June 2019- Sept 2020**

Oil Sands Monitoring Integration Workshop Series  
External Expert for Geospatial Analysis and Mercury

**Jan 2019**

**ADDITIONAL  
TRAINING**

Training in the Responsible Conduct of Research, National Institutes of Health  
Teaching Fundamentals Certificate, University of Toronto  
Machine Learning, University of Toronto

**Fall 2021  
Winter 2020  
Fall 2019**

**LANGUAGES**

English - Native Language, French - Good  
R - Advanced, Python - Intermediate, LaTeX- Intermediate

**PROFESSIONAL  
MEMBERSHIPS**

Society of Toxicology (SOT) 2021 - Present  
Data Visualization Society 2019 - Present