

# Kristin M. Eccles

# Curriculum Vitae

## CONTACT INFORMATION

Exposure and Biomonitoring Division  
Health Canada  
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## HIGHLIGHTS

23 peer-reviewed publications (10 as first author)  
343 citations; h index = 10 and i10 index = 10  
Research interests: Exposome, biomarkers, NAMs, geospatial modeling

## CURRENT POSITION

### Research Scientist

July 2023 - Present

Principle Investigator, Computational Toxicology 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  
Advisor: Laurie Chan, Ph.D.

### M.Sc., Geography

2014

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

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

2012

McMaster University, Hamilton, Canada  
Advisor: 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  
Postdoctoral Advisors: 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  
Postdoctoral Advisors: Igor Lehnerr, 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

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. 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

#### CONFERENCE PROCEEDINGS

**Eccles K.M.**, Thomas P.J., Chan H.M. (2016). Evaluating mercury guidelines for furbearers using

a predictive meta-model. Canadian Ecotoxicity Workshop. Edmonton, Canada.

Bertazzon, S., Barrett, O., Johnson, M., Eccles, K, Zhang, J. Y. (2014). Land use regression models (LUR) for reliable estimation of air quality in Calgary. Spatial Knowledge and Information. Banff, Canada.

#### INVITED TALKS

**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.

**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.

**Eccles K.M.**(2020). From biomarkers to biomes: Relationships between contaminant sources, exposures, and health outcomes. University of Toronto Intersectional Seminar Series. Toronto, Ontario.

**Eccles K.M.**(2020). Humans, wildlife, and the environment: Assessing ecological health. 2nd Annual GeoHealth Network Conference. Toronto, Ontario. (Cancelled due to COVID-19)

**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, Ontario.

**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, Ontario.

#### SELECTED CONFERENCE PRESENTATIONS (12/24)

**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., Lehnherr, 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., Lehnherr, I., Porter, T. (2019). Assessing variability of atmospheric mercury ( $\text{Hg}^0$ ) 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.

**Eccles K.M.**, Thomas P.J., Chan H.M. (2018). Using geospatial methods to quantify the co-dispersion of mercury sources and exposures in river otter (*Lontra canadensis*) for risk prediction (Presentation). International Society of Exposure Science and International Society of Environmental Epidemiology Joint Meeting. Ottawa, Canada.

#### TEACHING EXPERIENCE

##### **Primary Instructor**

Graduate Level Short Course: Introduction to R in Open-Source Methods  
Department of Geography, Geomatics and Environment, University of Toronto

**Fall 2020**  
**Winter 2020**

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

**Spring 2020**

Introduction to Quantitative Methods  
Department of Geography and Environmental Studies, Carleton University

**Winter 2018**

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

**May 2017**

Introduction to Geomatics  
Department of Geography, Environment and Geomatics, University of Ottawa

**Fall 2016**

##### **Teaching Assistant**

University of Ottawa, Ottawa, ON  
Spatial Ecology, Biostatistics, Environmental Science

**2014 - 2017**

#### COMPETITIVE AWARDS

Society of Toxicology (SOT) Mixtures Specialty Section  
Best Postdoctoral Abstract (2023)  
Society of Toxicology (SOT) Biological Modeling Specialty Section

**Recognition**

	Andersen-Clewell Trainee Award - 2nd Place (2023)	<b>Recognition</b>
	NIEHS Paper of the Year (2022)	<b>Recognition</b>
	North Carolina Society of Toxicology (NCSOT)	
	Best Postdoctoral Poster and Presentation (2022)	<b>\$300</b>
	SETAC Travel Award (2022)	<b>\$1050</b>
	University of Toronto Postdoctoral Award (2019-2020)	<b>\$45,000</b>
	NSERC CREATE-REACT (2016 - 2018)	<b>\$20,000</b>
	NSERC CREATE-REACT Travel Award (2018)	<b>\$5,000</b>
	University of Ottawa Excellence Scholarship (2016 - 2017)	<b>\$8,200</b>
	Queen Elizabeth II Graduate Scholarship in Science and Technology (2016 - 2017)	<b>\$15,000</b>
	University of Ottawa Entrance Scholarship (2014 - 2018)	<b>\$38,000</b>
<b>LEADERSHIP AND SERVICE</b>	<b>Conference Sessions and Workshops Delivered</b>	
	Society of Environmental Toxicology and Chemistry, Fort Worth, USA	<b>Nov 2020</b>
	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	
	International Conference on Mercury as a Global Pollutant, Krakow, Poland	<b>Sept 2019</b>
	Workshop: Latest Advances in Wildlife Biomonitoring	
	<b>Expert Working Group Member</b>	
	Arctic Monitoring Assessment Program (AMAP)	<b>June 2019- Sept 2020</b>
	Mercury Expert Working Group	
<b>ADDITIONAL TRAINING</b>	Oil Sands Monitoring Integration Workshop Series	<b>Jan 2019</b>
	External Expert for Geospatial Analysis and Mercury	
	Training in the Responsible Conduct of Research, National Institutes of Health	<b>Fall 2021</b>
	Teaching Fundamentals Certificate, University of Toronto	<b>Winter 2020</b>
<b>LANGUAGES</b>	Machine Learning, University of Toronto	<b>Fall 2019</b>
	English - Native Language, French - Good	
<b>PROFESSIONAL MEMBERSHIPS</b>	R - Advanced, Python - Intermediate, LaTeX- Intermediate	
	Society of Toxicology (SOT)	
	Data Visualization Society	