

Kristin M. Eccles

Curriculum Vitae

CONTACT INFORMATION

Division of Translational Toxicology
National Institute of Environmental Health Sciences
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HIGHLIGHTS

21 journal publications (10 as first author)
300 citations; h index = 10 and i10 index = 10
Research interests: Exposome, biomarkers, NAMs, geospatial modeling, spatial epidemiology

CURRENT POSITION

Postdoctoral Research Fellow **Nov 2020 - Present**
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.

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., Major: Health Studies, Minors: Geography and Earth Science **2012**
McMaster University, Hamilton, Canada
Advisor: John Eyles, Ph.D.

PROFESSIONAL APPOINTMENT/ EMPLOYMENT

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

Research Assistant **Sept 2014 - Dec 2019**
First Nation Food Nutrition and Environment Study, University of Ottawa, Ottawa, Canada

PEER-REVIEWED PUBLICATIONS

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>

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., Lehnerr, 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., Lehnerr, 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.

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	Fall 2020
Department of Geography, Geomatics and Environment, University of Toronto	Winter 2020

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	

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)	Recognition
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

Conference Sessions and Workshops Delivered

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	

	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) Society of Environmental Chemistry and Toxicology (SETAC) Data Visualization Society	