Kristin M. Eccles — Curriculum Vitae

Contact Information

Exposure and Biomonitoring Division
Health Canada
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Highlights

25 peer-reviewed publications (10 as first author)
385 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
Postdoctoral 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
Postdoctoral Advisers: Igor Lehnherr, 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

25. Stalwick, J., Somers, G., **Eccles K.M.**, Thomas, P.J., Cunada, C., Gurney, K. (in press). The Influence of Environmental Factors such as Snow and Fire on Spatial and Temporal Patterns of Polycyclic Aromatic Compounds in the Mackenzie. *Environmental Pollution*
24. Cheney, C.L., **Eccles K.M.**, Lehnherr, 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`

23. 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`

22. 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

21. **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

20. Boutet, V., Dominique, M., **Eccles, K.M.**, Branigan, M., Dyck, M., van Coeverden de Groot, P., Lougheed, 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

19. 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

18. 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

17. 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

16. **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

15. 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

14. **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

13. 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

12. 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

11. **Eccles, K.M.**, Majeed, H., Lehnherr, 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
10. 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
9. **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.20
8. **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
7. **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
6. **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
5. 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
4. 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
3. **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
2. **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
1. 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

1. 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 (12/24)

12. **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
11. **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.
10. **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
9. **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.
8. **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.
7. **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.
6. **Eccles K.M.**, Clackett A., Ghotra, A., Majeed, I., Lehnherr, 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.

5. **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.
4. **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.
3. **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.
2. **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.
1. **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.

Media

SOT TV 2024
Innovation Uncaged: from lab to screen in chemical hazard assessment
The Next Frontier in Toxicology: Computational and Geospatial Methods in Toxicology Research

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) — **$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

International Conference on Mercury as a Global Pollutant, Krakow, Poland **Sept 2019**
Workshop: Latest Advances in Wildlife Biomonitoring

Expert Working Group Member

Arctic Monitoring Assessment Program (AMAP) **June 2019- Sept 2020**
Mercury Expert Working Group

Oil Sands Monitoring Integration Workshop Series **Jan 2019**
External Expert for Geospatial Analysis and Mercury

Additional Training

Training in the Responsible Conduct of Research, National Institutes of Health	**Fall 2021**
Teaching Fundamentals Certificate, University of Toronto	**Winter 2020**
Machine Learning, University of Toronto	**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