Gavin L. Simpson

Date of Birth: 11th November 1976 **Nationality:** British citizen
Orcid ID: 0000-0002-9084-8413 **Bluesky**: @gsimpson.bsky.social
Website: fromthebottomoftheheap.net **LinkedIn**: gavin-l-simpson
Languages: English (native speaker); Danish (module 3.3)

Career resume

2021 to date Assistant Professor of Applied Biometrics – Department of Animal and Veterinary Sciences, Aarhus University.

2020 – 2021 Sessional lecturer III – *Data Science for Health Analytics and Decision Support* at Johnson Shoyama Graduate School of Public Policy, University Regina.

2015 – 2021 Sessional lecturer III – *Biostatistics for Public Health* at Johnson Shoyama Graduate School of Public Policy, University Regina.

2013 – 2021 Quantitative Environmental Scientist, Institute of Environmental Change and Society, University of Regina

2013 to date Adjunct Professor of Biology, Department of Biology, University of Regina

2013 to date Adjunct Professor, Faculty of Graduate Studies and Research, University of Regina

2001 – 2012 Post-doctoral Research Associate jointly with the Environmental Change Research Centre (University College London) and ENSIS Ltd.

1998 – 2002 Ph.D. research project – *Defining restoration targets for acidified upland lakes using diatom and cladoceran sub-fossil remains and the modern analogue technique*.

Education

1998 – 2002 Ph.D. Geography, University College London.

1995 – 1998 B.Sc. (Hons.) Environmental Geography, University College London.

Research Interests

I am an ecologist and statistician with a broad interest in understanding how communities and ecosystems change over time and space in response to disturbances and environmental change.

As an ecologist, I approach my research through a temporal ecology lens, combining contemporary and palaeoecological perspectives with computational and statistical approaches. Current research interests involve ecosystem responses to rapid

environmental change & regime shifts; estimating variance as a driver of and response to ecological change; hierarchical models to assess trends in biodiversity data; spatiotemporal models of lake-ice change; operationalising rank abundance diagrams to understand the dynamics of community responses to disturbance; compositional change in production animal microbiomes; and the emergence of novel ecosystems.

As a statistician, my primary areas of interest are in spatio-temporal modelling using generalized additive models (GAMs) and penalized splines; multivariate data analysis methods; joint models for longitudinal and survival data; copula models for investigating complex dependencies among variables.

The use of modern computational and statistical methods is an integral part of my research, particularly in the development and application of modern multivariate and time series techniques to environmental and ecological data sets. One output of my research interests is R-based software for working with GAMs, multivariate ordination, and permutation tests.

Publications

A full list of publications with links to pre-, post-, and re-prints is available at my website fromthebottomoftheheap.net/publications/. Citation details are available from Google Scholar.

Journal Articles

Submitted / in review

Carter-Champion, A., **Simpson, G.L.**, Pearce, C., de Vernal, A., Seidenkrantz, M-S (in review) Climate Change and Marine Diversity in the Arctic: Holocene Insights from the Baffin Bay-Labrador Sea region. *Communications Earth & Environment*.

Miranda-Vélez, J.F., **Simpson, G.L.**, Hansen, E.M., & Munkholm, L.J. (revision submitted) In-season effects of winter cover crops and tillage on soil NO_3^- and N leaching – analysis with generalized additive models. *Agriculture, Ecosystems and Environment*.

Haig, H.A., Hayes, N.M., **Simpson, G.L.**, Yi, Y., Wissel, B., Finlay, K., Hodder, K.R., Leavitt, P.R. (in revision) Application of isotope mass-balance models (δ^2H, $\delta^{18}O$) to assess spatial variability in lake hydrology on the Northern Great Plains, Canada. *Journal of Hydrology*.

Robles, D., Bergeron, Y., Kryshen, A., **Simpson, G.L.**, Niklasson, M., Palm, L.A., Ryzhkova, N., & Drobyshev, I. (submitted) 500 years of forest fire activity in Sweden reveal consistent and non-monotonic relationships to human population density and summer precipitation. *Nature Communications*.

Gerlich, H.S., Loboda, S., **Simpson, G.L.**, Savage, J., Schmidt, N.M., Holmstrup, M., Høye, T.T (in press) Species' traits modulate rapid changes in flight time in high-Arctic muscid flies under climate change. *Proceedings of the Royal Society of London B* **292**, 20250970.

Published

Turner, S.D., Rose, N.L., Boyle, J., **Simpson, G.L.**, Gardner, E. (2025) Historical (1850-1995) nitrogen changes in UK catchments recorded by lake sediment $\delta^{15}N$. *Environmental Chemistry* **22**, EN23031.

Kvorning, A.B., Heikkilä, M., Pearce, C., Seidenkrantz, M-S., **Simpson, G.L.**, Meire, L., Kuijpers, A., Larsen, N.K., & Ribeiro, S. (2025) A Holocene fjord record from Greenland reveals

exceptional Atlantic water influence during minimum ice-sheet extent. *Communications Earth & Environment* **6**, 326.

Pearce, C., Caissie, B.E., Carter-Champion, A., Limoges, A., Luostarinen, T., **Simpson, G.L.**, & Weckström, K. (2025) Fossil diatoms in Arctic marine sediments. *PAGES Magazine* **33**(1), 40.

Simpson, G.L. (2024) gratia: An R package for working with generalized additive models. *Journal of Open Source Software* **9**(104), 6982.

Pla-Rabés, S., Matias, M.G., Gonçalves, V., Vázquez Loureiro, D., Marques, H., Bao, R., Buchaca, T., Hernández, A., Giralt, S., Sáez, A., **Simpson, G.L.**, Nogué, S., & Raposeiro, P.M. (2024) Global warming triggers abrupt regime shifts in island lake ecosystems in the Azores Archipelago. *Communications Earth & Environment* **5**, 571.

Polazzo, F., Limberger, R., Pennekamp, F., Ross, S., **Simpson, G.L.**, & Petchey, O. (2024) Measuring the Response Diversity of Ecological Communities Experiencing Multifarious Environmental Change. *Global Change Biology* **30**(11), e17594.

Jansen, J., **Simpson, G.L.**, Weyhenmeyer, G.A., Härkönen, L.H., Paterson, A.M., del Giorgio, P. & Prairie, Y. (2024) Climate-driven deoxygenation of northern lakes. *Nature Climate Change* **14**, 832–838.

Gushulak, C.A.C., Mezzini, S., Moir, K.E., **Simpson, G.L.**, Bunting, L., Wissel, B., Engstrom, D.R., Laird, K.LR., St. Amand, A., Cumming, B.F. & Leavitt, P.R. (2024) Eutrophication and abrupt changes in large prairie lakes (Lakes Manitoba and Winnipeg) due to increased nutrient influx from proximal sources. *Freshwater Biology* **69**(1), 47–63.

Jensen, S.A., Webb, J.R., **Simpson, G.L.**, Baulch, H.M., Leavitt, P.R., & Finlay, K. (2023) Controls of Carbon Dioxide, Methane, and Nitrous Oxide Emissions in Natural and Constructed Agricultural Waterbodies on the Northern Great Plains. *Journal of Geophysical Research – Biogeosciences* **128**(4) e2022JG007261.

Panah, F.M., Nielsen, K.D., **Simpson, G.L.**, Schönherz, A., Schramm, A., Lauridsen, C., Nielsen, C.S., Højberg, O., Fredborg, M., Purup, S., & Canibe, N. (2023) Red meat consumption altered colonic microbiota and metabolites in a pig model for ulcerative colitis. *Frontiers in Microbiology* **14**:1018242.

Jensen, S.A., Webb, J.R., **Simpson, G.L.**, Baulch, H.M., Leavitt, P.R., & Finlay, K. (2022) Seasonal and diel patterns of CO_2, CH_4, and N_2O content and fluxes in small agricultural reservoirs of the northern Great Plains. *Frontiers in Environmental Science*. **10**:895531.

Enevoldsen, J., **Simpson, G.L.**, & Vistisen, S.T., (2022). Using generalized additive models to decompose time series and waveforms, and dissect heart–lung interaction physiology *Journal of Clinical Monitoring and Computing* **37**, 165–177.

Bjorndahl, J.A., Gushulak, C.A.C., Mezzini, S., **Simpson, G.L.**, Haig, H.A., Leavitt, P.R., & Finlay, K. (2022) Abrupt changes in the physical and biological structure of endorheic upland lakes due to 8-m lake-level variation during the 20th century. *Limnology and Oceanography* **67**(5), 1022–1039.

Schnell, L.J., **Simpson, G.L.**, Suchan, D.M., Quere, W., Weger, H.G., & Davis, M.C. (2021) An at-home lab in plant biology designed to engage students in the process of science. *Ecology and Evolution* **11**(24), 17572–12580.

Bergbusch, N., Hayes, N.M., **Simpson, G.L.**, Quiñones-Rivera, Z., & Leavitt, P.R. (2021) Effects of nitrogen removal from wastewater on phytoplankton in eutrophic prairie stream. *Freshwater Biology* **66**(12), 2283–2300.

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Velez, M.I., Salgado, S., Brenner, M., Hooghiemstra, H., Escobar, J.H., Boom, A., Bird, B., Curtis, J.H., Temoltzin-Loranca, Y., Fernanda Patino, L., Gonzalez-Arango, C., Metcalfe, S.E., **Simpson, G.L.**, & Velazquez, C. (2021) Novel responses of diatoms in neotropical mountain lakes to indigenous and post-European occupation. *Anthropocene* **34**,.100294.

Haig, H.A., Hayes, N.M., **Simpson, G.L.**, Yi, Y., Wissel, B., Hodder, K.R., Leavitt, P.R. (2021) Effects of seasonal seasonal, and interannual variability of water isotopes (δ^2H, δ^{18}O) in a chain of seven prairie lakes. *Journal of Hydrology X* **10**, 100069.

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Christensen, E.M., **Simpson, G.L.**, & Ernest, M. (2019) Established rodent community delays recovery of dominant competitor following experimental disturbance. *Proceedings of the Royal Society B — Biological Sciences* **286**: 20192269.

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Webb, J.R., Hayes, N.M., **Simpson, G.L.**, Leavitt, P.R., Baulch, H., & Finlay, K. (2019) Widespread nitrous oxide undersaturation in small agricultural waterbodies. *Proceedings of the National Academy of Sciences of the United States of America* **116**(20), 9814–9819.

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Hayes, N.M., Patoine, A., Haig, H.A., **Simpson, G.L.**, Swarbrick, V.J., Wiik, E., & Leavitt, P.R. (2019) Spatial and temporal variation in nitrogen fixation and its importance to phytoplankton phosphorus-rich lakes. *Freshwater Biology* **64**, 269–283.

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Swarbrick, V.J., **Simpson, G.L.**, Glibert, P.M., Leavitt, P.R. (2018) Differential stimulation and suppression of phytoplankton growth by ammonium enrichment in eutrophic hardwater lakes over 16 years. *Limnology & Oceanography* **64**(S1), S130–S149.

Wiik, E., Haig, H.A., Hayes, N.M., Finlay, K., **Simpson, G.L.**, Vogt, R.J., & Leavitt, P.R. (2018) Generalized additive models of climatic and metabolic controls of sub-annual variation in pCO2 in productive hardwater lakes *Journal of Geophysical Research: Biogeoscience* **123**(6), 1940–1959

Anderson, N.J., Curtis, C.J., Whiteford, E. J., Jones, V.J., McGowan, S., **Simpson, G.L.**, & Kaiser, J. (2018) Regional variability in the atmospheric nitrogen deposition signal and its transfer to the sediment record in Greenland lakes. *Limnology & Oceanography*, **63**(5), 2250–2265.

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Curtis, C.J., Kaiser, J., Marca, A., Anderson, N.J., **Simpson, G.L.**, Jones, V.J., & Whiteford, E. (2018) Spatial variations in snowpack chemistry and isotopic composition of NO_3^- along a nitrogen deposition gradient in West Greenland. *Biogeosciences* **15**, 529–550.

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Bogard, M., Finlay, K., Waiser, M., Tumber, V., Donald, D., Wiik, E., **Simpson, G.L.**, del Giorgio, P., & Leavitt, P.R. (2017) Effects of nitrogen fertilization and ecosystem pH on planktonic metabolism and atmospheric CO_2 exchange in hardwater lakes. *PLoS ONE* **12**(12): e0188652.

Eberts, R.L., Wissel, B., **Simpson, G.L.**, Crawford, S.S., Stott, W., Hanner, R.H., Manzon, R.G., Wilson, J.Y., Boreham, D.R., & Somers, C.M. (2017) Isotopic structure of Lake Whitefish in Lake Huron: evidence for regional and local populations based on resource use. *North American Journal of Fisheries Management* **37**(1): 133–148.

Bunting, L., Leavitt, P.R., **Simpson, G.L.**, Wissel, B., Laird, K.R., Cumming, B.F., St. Amand, A., & Engstrom, D.R. (2016) Increased variability and sudden ecosystem state change in Lake Winnipeg, Canada, caused by 20th century agriculture. *Limnology & Oceanography* **61**(6); 2090–2107.

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Bennion, H., **Simpson, G.L.**, & Goldsmith, B.J. (2015) Assessing degradation and recovery pathways in lakes impacted by eutrophication using the sediment record. *Frontiers in Ecology & Evolution* **3**:94

Wiik, E., Bennion, H., Sayer, C.D., Davidson, T.A., Clarke S.J., McGowan, S., Prentice, S., **Simpson, G.L.**, & Stone, L. (2015) The coming and going of a marl lake: multi-indicator palaeolimnology reveals abrupt ecological change and alternative views of reference conditions. *Frontiers in Ecology & Evolution* **3**:82

Bennion, H., Davidson, T.A., Sayer, C.D., **Simpson, G.L.**, Rose, N.L., & Sadler, J.P. (2015) Harnessing the potential of the multi-indicator palaeoecological approach: an assessment of the nature and causes of ecological change in a eutrophic shallow lake. *Freshwater Biology* **60**(7), 1423–1442.

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Finlay, K., Vogt, R.J., Bogard, M.J., Wissel, B., Tutolo, B.M., **Simpson, G.L.**, & Leavitt, P.R. (2015) Decrease in CO_2 efflux from northern hardwater lakes with increasing atmospheric warming. *Nature* **519**, 215–218.

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Sayer, C.D., Jackson, M.J., Hoare, D., **Simpson, G.L.**, Henderson, A.C.G., Liptrott, E.R., Appleby, P.G., Boyle, J.F., Jones, I.J. and Waldock, M.J. (2006) TBT causes regime shift in shallow lakes? *Environmental Science and Technology* **40(17)**, 5269-5275.

Simpson, G.L., Shilland, E.M., Winterbottom, J.M., and Keay, J. (2005) Defining reference conditions for acidified waters using a modern analogue approach. *Environmental Pollution* **137**, 119-133.

Battarbee, R.W., Monteith, D.T., Juggins, S., Evans, C. D., Jenkins, A. and **Simpson, G.L.** (2005) Reconstructing pre-acidification pH for an acidified Scottish loch: a comparison of palaeolimnological and modelling approaches. *Environmental Pollution* **137**, 135-149.

Bennion, H., Fluin, J., and **Simpson, G.L.** (2004) Assessing eutrophication and defining ecological reference conditions for a set of Scottish freshwater lochs using sub-fossil diatom assemblages. *Journal of Applied Ecology* **41**, 124-138.

Book Chapters

Curtis, C.J., **Simpson, G.L.**, Battarbee, R.W., & Maberley S. (2014) Challenges in Defining Critical Loads for Nitrogen in UK Lakes. In Sutton, M.A., Mason, K.E., Sheppard, L.J., Sverdrup, H., Haeuber, R., & Hicks, W.K. (Eds) *Nitrogen Deposition, Critical Loads and Biodiversity*. Springer, Dordrecht

Baron, J.S. & 38 others (2014) The Effects of Atmospheric Nitrogen Deposition on Terrestrial and Freshwater Biodiversity. In Sutton, M.A., Mason, K.E., Sheppard, L.J., Sverdrup, H., Haeuber, R., & Hicks, W.K. (Eds) *Nitrogen Deposition, Critical Loads and Biodiversity*. Springer, Dordrecht.

Simpson, G.L. and Birks H.J.B. (2012) Statistical Learning in Palaeolimnology. In Birks, H.J.B, Lotter, A.F. Juggins S., and Smol, J.P. (Eds) *Tracking Environmental Change Using Lake Sediments, Volume 5: Data Handling and Numerical Techniques*. Springer, Dordrecht.

Simpson, G.L. and Hall R.I. (2012) Human impacts: applications of numerical methods to evaluate surface water acidification and eutrophication. In Birks, H.J.B, Lotter, A.F. Juggins S., and Smol, J.P. (Eds) *Tracking Environmental Change Using Lake Sediments, Volume 5: Data Handling and Numerical Techniques*. Springer, Dordrecht.

Simpson, G.L. (2012) Analogue methods in Palaeolimnology. In Birks, H.J.B, Lotter, A.F. Juggins S., and Smol, J.P. (Eds) *Tracking Environmental Change Using Lake Sediments, Volume 5: Data Handling and Numerical Techniques*. Springer, Dordrecht.

Bennion, H., **Simpson, G.**, Battarbee, R.W., Cameron, N.G., Curtis, C., Flower, R.J. Hughes, M., Jones, V.J., Kernan, M., Monteith, D.T., Patrick, S.T., Rose, N.L., Sayer, C.D. & Yang, H. (2002) Environmental change in Scottish fresh waters. In M.B. Usher, E.C. Mackey & J.C. Curran (Eds)

The State of Scotland's Environment and Natural Heritage. The Stationery Office, Edinburgh. pp. 145-152.

Research reports and other publications

Turner, S.D., **Simpson, G.L.** and Hughes M.J. (2011) Standardised Bathymetric Data Generation and Statistical Analysis of Welsh Lakes. Report to CCW.

Curtis, C. and **Simpson, G.** (2010) Acid deposition trends at AWMN Sites. In: Kernan, M., Battarbee, R.W., Curtis, C.J., Monteith, D.T. & Shilland, E.M. (Eds) Recovery of lakes and streams in the UK from the the effects of acid rain. UK Acid Waters Monitoring Network 20 Year Interpretative Report. ECRC Research Report 141, pp. 14-35.

Monteith, D., Evans, C., **Simpson, G.** and Curtis, C. (2010) Hydrochemistry. In: Kernan, M., Battarbee, R.W., Curtis, C.J., Monteith, D.T. & Shilland, E.M. (Eds) Recovery of lakes and streams in the UK from the the effects of acid rain. UK Acid Waters Monitoring Network 20 Year Interpretative Report. ECRC Research Report 141, pp. 36-81.

Flower, R., **Simpson, G.**, Kresier, A., Yang, H., Shilland, E. and Battarbee, R. (2010) Epilithic Diatoms. In: Kernan, M., Battarbee, R.W., Curtis, C.J., Monteith, D.T. & Shilland, E.M. (Eds) Recovery of lakes and streams in the UK from the the effects of acid rain. UK Acid Waters Monitoring Network 20 Year Interpretative Report. ECRC Research Report 141, pp. 82-96.

Hildrew, A., Winterbottom, J., Orton, S., Murphy, J., **Simpson, G.** and Shilland, E. (2010) Macroinvertebrates. In: Kernan, M., Battarbee, R.W., Curtis, C.J., Monteith, D.T. & Shilland, E.M. (Eds) Recovery of lakes and streams in the UK from the the effects of acid rain. UK Acid Waters Monitoring Network 20 Year Interpretative Report. ECRC Research Report 141, pp. 111-124.

Curtis, C., Battarbee, R., Helliwell, R., Flower, R., **Simpson, G.**, Monteith, D., Shilland, E., Aherne, J. and MacDougall, G. (2010) Recovery progress: reference conditions and restoration targets. In: Kernan, M., Battarbee, R.W., Curtis, C.J., Monteith, D.T. & Shilland, E.M. (Eds) Recovery of lakes and streams in the UK from the the effects of acid rain. UK Acid Waters Monitoring Network 20 Year Interpretative Report. ECRC Research Report 141, pp. 190-221.

Curtis, C., Battarbee, R., Shilland, E., **Simpson, G.**, Kernan, M. and Monteith, D. (2010) The UK Acid Waters Monitoring Network: 20 Year Interpretive Report – a brief summary. In: B.-L. Skjelkvåle, H. de Wit & D. Jeffries (Eds), Proceedings of the 25th Meeting of the ICP Waters Task Force in Burlington, Canada, October 19-21, 2009. NIVA Report No. 5995-2010, NIVA, Oslo, Norway, pp. 29-35.

Monteith, D., and **Simpson, G.L.** (2007) Macroinvertebrate classification diagnostic tool development. Final report to SNIFFER on Project WFD60.

Curtis, C.J., and **Simpson, G.L.** (Eds) (2007) The effects of nitrogen deposition and climate change on freshwaters in the UK. Report to Defra under contract CPEA17. ECRC Research Report No. 115.

Curtis, C., and **Simpson, G.L.** (Eds) (2004) Summary of research under DEFRA contract "Recovery of acidified freshwaters in the UK" EPG/1/3/183. ECRC Research Report No. 98.

Bennion, H.B., Davidson, T., **Simpson, G.L.**, Solovieva, N., Rose, N.L., Theophile, S., Yang, H., Anderson, N.J., Brooks, S. and Peglar, S. (2004) Identification of reference lakes and evaluation of palaeoecological approaches to define reference conditions for UK (England, Wales, Scotland & Northern Ireland) ecotypes. Final report of project WFD08. Scotland and Northern Ireland Forum for Environmental Research (SNIFFER).

Bennion, H.B. and **Simpson, G.L.** (2003) Identification of reference lakes and evaluation of palaeoecological approaches to define reference conditions for UK (England, Wales, Scotland & Northern Ireland) ecotypes. Progress report to SNIFFER on project WFD08.

Bennion, H., Hilton, J., Hughes, M., Clark, J., Hornby, D., Kernan, M., and **Simpson, G.L.** (2003) Development of a risk based prioritisation protocol for standing waters in Great Britain based on a georeferenced inventory - Phase 2. EA R&D Technical Report P2-260/2/TR1.

Curtis, C., Cooper, D., Jenkins, A., Kernan, K., Pope, L. and **Simpson, G.L.** (2003) Freshwater screening and assessment based on freshwater critical loads. Environment Agency R&D Report Reference No 12094: Technical Report.

Curtis, C., and **Simpson, G.L.** (2001) Summary of research under DETR contract "Acidification of fresh waters: the role of nitrogen and the prospects for recovery" Volumes 1-3. ECRC Research Report No. 79.

Simpson, G.L. (2001) Biological targets for recovery from lake acidification: Developing the analogue matching procedure. In Curtis, C. and Simpson, G. L. [Eds] (2001). Summary of research under DETR contract "Acidification of fresh waters: the role of nitrogen and the prospects for recovery: Work Package 2: Recovery". ECRC Research Report No. 79.

Simpson, G.L. (2000) Palaeolimnological analogues in defining target assemblages for the recovery of acidified surface waters: a desk study. ECRC Research Report No. 74.

Key Skills & Courses

Key Skills

Analytical

Internationally recognised expert in data science, ecoinformatics, and statistical ecology, with two decades of post-doctoral experience in the analysis of high dimensional ecological, environmental, and biological data. Taught a range of courses in statistical ecology, data science and ecoinformatics at undergraduate to post-doctoral levels.

Skilled in preparation and analysis of Cladocera and diatom sub-fossil remains, light microscopy, nitrogen and carbon isotope palaeolimnology, radiometric dating and sediment stratigraphy, experience in analysis of algal pigments and high-performance liquid chromatography, experience in analysis of water chemistry via ion chromatography. Experience in the analysis of greenhouse gases (CO_2, N_2O, CH_4) from lakes and ponds.

Fieldwork

Extensive background and experience sampling lakes, ponds, and rivers, especially in remote and upland locations. Completed numerous multi-week sampling trips in the UK, Greenland, Canada, and Norway, to collect aquatic, soil, and sediment samples. I am also a trained RYA powerboat operator.

Computing

Excellent computing skills particularly programming and development in the R statistical language, and systems administration of Windows and Linux workstations and servers. Strong word processing and data handling skills (R, Markdown, LaTeX, Quarto, MS Office, LibreOffice). Proficient in web site scripting (HTML, CSS, Shiny, PHP & Apache) and database server administration (MySQL, MariaDB). Good general programming skills (PHP, SQL, C).

Training Courses Attended

2024

Aarhus University Pedagogical Programme. 150 hours of pedagogical training.

2022-2023	Developmental course for research leader talents: Mission-oriented research & innovation (Aarhus University)
2018	University Teaching Certificate Program. (Fall semester, University of Regina)
2013	Laboratory Safety Training Certificate (10 September 2013)
2011	RYA Powerboat Level 2 (21-22 November 2011)
2005	*Bayesian Analysis, MCMC and WinBUGS*. MRC Biostatistics Unit, Cambridge
2004	*Statistics for Environmental Evaluation: Module 1.* NERC/ESPRC Environmental Mathematics and Statistics Workshops and Training Courses. Department of Statistics, University of Glasgow.
2004	*Statistics for Environmental Evaluation: Module 2.* NERC/ESPRC Environmental Mathematics and Statistics Workshops and Training Courses. Department of Statistics, University of Glasgow.
2001	Introduction to Plant Macrofossil Analysis. NERC-recognised short course. Environmental Change Research Centre, UCL Geography.
1999	*Numerical analysis of biological and environmental data*. NERC-recognised short course. Environmental Change Research Centre, UCL Geography.
1999	*Introduction to Diatom Analysis.* NERC-recognised short course. Environmental Change Research Centre, UCL Geography.

Research Projects & Funding

2024	International MARDI workshop: Arctic diatom ecology. iClimate (Co-Applicant, DKK 26,000 (US $3,900)
2024 –	Open Palaeoecological Data - analysing the past building foresight. EU Cost Action. (Co-Applicant [Secondary Proposer])
2023 – 2024	Mavesår hos grise – et overset velfærdsproblem (Stomach ulcers in pigs – an overlooked welfare problem) (Co-applicant, DKK 784,350 (US $97,000))
2023 – 2024	Forlænget laktation: Optimal strategi for laktationslængde på ko- og besætningsniveau (Extended lactation: Optimal strategy for lactation length at cow and herd level) – Mælkeafgiftsfonden (Co-applicant, DKK 1,630,000 (US $225,000))
2022 – 2024	Aarhus University Research Foundation (Aarhus UniversitetsForskningsfond) Starting Grant (Applicant, DKK 1,600,000 (US $221,000))
2020 – 2026	*NSERC CREATE in ecology, evolution and environmental science: The Living Data Project*. NSERC Collaborative Research and Training Experience (CREATE) Grant (Co-Applicant, $1,650,00)
2019 – 2020	*Creating a unified approach to evaluate regime shift detection methods*. Canadian Institute of Ecology and Evolution Working Group (Co-Applicant $12,400)
2018	*Development of a High-resolution Technique to Monitor Landfarm Hydrocarbon Biodegradative Activity*. NSERC Engage Grant ($25,000)
2016 – 2019	*Evaluating the role of agricultural impoundments as sources of greenhouse gases in prairie ecosystems*. Saskatchewan Ministry of Agriculture (Applicant and Co-Investigator, $250,000)

2014 – 2022	*Evaluating the prevalence of early warning signals in paleoecological time series of state change*. NSERC Discovery Grant (Applicant & Principal Investigator, $250,000).
2013 – 2016	*Lakes and the Arctic Carbon Cycle*. NERC Standard Grant in Arctic Research Programme. (Research Co-Investigator, £1,108,165).
2012 – 2015	*LTLS: Analysis and simulation of the Long-Term / Large-Scale interactions of C, N, and P in UK land, freshwater and atmosphere*. NERC Standard Grant in Macronutrient Cycling thematic programme. (Research Co-Investigator, £1,161,417).
2011 – 2014	*A United Kingdom Lake Ecological Observatory Network*. NERC Standard Grant in Network of Sensors thematic programme. (Research associate and supervisor of tied Ph.D. Studentship, £1,448,743).
2010 – 2014	*REFRESH*: EU FP7 Research Project. (Research associate)
2010 – 2014	*BioFRESH*: EU FP7 Research Project (Research associate)
2010 – 2011	Standardised Bathymetric Data Generation and Statistical Analysis of Welsh Lakes. Consultancy project on behalf of CCW. (Co-Investigator)
2010 – 2013	*Long-range atmospheric Nitrogen deposition as a driver of ecological change in Arctic lakes*. NERC Standard Grant (Research Co-investigator, £749,503)
2010 – 2013	*The effect of Nitrogen deposition and climate change on freshwaters in the UK*. (Contract Extension and Variation). Department for Environment, Food and Rural Affairs Freshwater Umbrella contract. (Co-investigator, £1,065,690)
2009 – 2010	*Water Temperature Archive – Phase II*. UK Environment Agency (Principal Investigator)
2008 – 2009	*Water Temperature Archive*. UK Environment Agency (Co-investigator)
2007 – 2010	*The effect of Nitrogen deposition and climate change on freshwaters in the UK*. Department for Environment, Food and Rural Affairs Freshwater Umbrella contract. (Co-investigator)
2008 – 2009	*Macroinvertebrate Classification Diagnostic Tool – Phase III*. SNIFFER and SEPA (WFD60). (Lead-investigator)
2007 – 2008	*Macroinvertebrate Classification Diagnostic Tool – Phase II*. SNIFFER (WFD60). (Co-investigator)
2007 – 2010	*The effect of nitrogen deposition on freshwaters in the UK*. NERC Isotope Geoscience Facilities Steering Committee. (Co-investigator)
2005 – 2009	*Macroinvertebrate Classification Diagnostic Tool*. SNIFFER (WFD60). (Co-investigator)
2004 – 2007	*The effect of Nitrogen deposition and climate change on freshwaters in the UK*. Department for Environment, Food and Rural Affairs Freshwater Umbrella contract. (Co-investigator)
2004 – 2006	*Palaeolimnology and shallow lake ecosystem restoration*. Royal Society Joint Project in association with Chinese Academy of Sciences and Nanjing Institute of Geography and Limnology.
2004	*Modellering av biologisk referansetilstand og fremtidig restaureringsmål for forsurete innsjøer*. NIVA, Norway.
2004 – 2009	*Euro-limpacs: Integrated project to evaluate impacts of global change on European freshwater ecosystems*. European Union under Framework VI.
2002 – 2004	*Palaeolimnological approaches to the Water Framework Directive: Identification of reference lakes and evaluation of palaeoecological approaches to define reference conditions for UK (England, Wales, Scotland and Northern Ireland) ecotypes*. SNIFFER.

2002 – 2003 *Freshwater screening and assessment based on freshwater critical loads*. Environment Agency.

2001 – 2004 *Recovery of acidified waters in the UK*. DEFRA Freshwater Umbrella contract.

2001 – 2002 *Great Britain Lakes Inventory Project*. Environment Agency.

1998 – 2002 *Biological Targets for Recovery in Acidified Lakes*, PhD work funded by DETR under the CLAM project.

1998 – 2001 *Critical Loads of Acidity and Metals Program (CLAM)*, funded by the DETR.

Service Responsibilities & Teaching experience

Service Responsibilities

2023 to 2025 Department of Animal and Veterinary Sciences representative to the Faculty of Technical Sciences' *Faculty Information Security Committee* (FISU).

2022 to 2025 Theme group leader – *Digital Transformation*, Department of Animal and Veterinary Science, Aarhus University.

2022 to 2025 Department of Animal and Veterinary Sciences representative to the Faculty of Technical Sciences' *Digital Infrastructure Committee* (DICOM).

2020 to date Associate Editor for *Methods in Ecology and Evolution*.

2021 to 2022 Editor for The R Journal.

2019 to 2020 Associate Editor for *Frontiers in Ecology and Evolution – Models in Ecology and Evolution*, Frontiers.

2015 to 2020 Associate Editor for *Frontiers in Ecology and Evolution – Paleoecology*, Frontiers.

2013 to 2021 Editorial board member for *Scientific Data*, Springer Nature.

2017 to 2020 Evaluation Group Member, NSERC Evaluation Group 1503 (Ecology & Evolution). Evaluation panel member for NSERC's Discovery Grant programme.

2017 to 2019 Secretary, Paleoecology Section of the Ecological Society of America.

2016 to 2017 Chair, Paleoecology Section of the Ecological Society of America.

2015 to 2016 Vice Chair, Paleoecology Section of the Ecological Society of America.

2008 to 2012 Convenor of Department of Geography physical geography research seminar series.

2003 to 2012 Co-convenor of the ECRC short course '*Numerical analysis of biological and environmental data*'.

2002 to 2012 Systems administration for ECRC/ENSIS web, database, file and print servers.

Teaching experience

May 2024 *Multivariate Data Analysis with R and vegan* – 1-week, applied statistics course, taught for Physalia Courses.

Apr 2024 *Generalised Additive Models in R; a data-driven approach to estimating regression models* – Second offering of this 1-week course applied statistics course for Physalia Courses.

Nov 2023 *Multivariate Data Analysis with R and vegan* – 1-week, applied statistics course, taught for Physalia Courses.

Nov 2023	*Generalised Additive Models in R; a data-driven approach to estimating regression models* – Second offering of this 1-week course applied statistics course for Physalia Courses.
Nov 2022	*Numerical ecology and time series analysis of marine proxy data*. Three-day workshop on the statistical treatment of sedimentary proxy data and data handling as a foundation for accurate and robust palaeo environment/climate reconstructions. For the ACME working group of PAGES.
Nov 2022	*Multivariate Data Analysis with R and vegan* – 1-week, applied statistics course, taught for Physalia Courses.
Nov 2022	*Data Manipulation & Statistical Analysis in Palaeoecology: Masterclass in R*. Contributed 1 day on Generalized Additive Models as part of this 4-day workshop run by the British Ecological Society's Palaeoecology Special Interest Group.
Oct 2022	*Generalised Additive Models in R; a data-driven approach to estimating regression models* – Second offering of this 1-week course applied statistics course for Physalia Courses.
Sep 2022	*Multivariate Analysis of Biological Data using R* – 2.5 ECTS PhD course at Aarhus University.
Feb 2022	*Generalised Additive Models in R; a data-driven approach to estimating regression models* – 1-week, applied statistics course, taught for Physalia Courses.
May 2021	*Data Manipulation & Statistical Analysis in Palaeoecology: Masterclass in R*. Contributed 1 day on Generalized Additive Models, Topic models, and network analysis as part of this 4-day workshop run by the British Ecological Society's Palaeoecology Special Interest Group.
2020 to 2020	*Data Science for Health Analytics and Decision Support* – I developed this online graduate-level course for the Masters of Health Administration programme, Johnson Shoyama Graduate School of Public Policy, University Regina. I taught the course once before leaving U Regina.
2015 to 2020	*Biostatistics for Public Health* – graduate level course in biostatistics for participants on the Master of Health Administration, Johnson Shoyama Graduate School of Public Policy, University Regina.
2013 to 2021	Two lectures/seminars on Open Science contributed to Biology 803, a methods course for Biology graduate degree candidates, University of Regina.
2015 to 2019	Co-convener of *Modelling Biological Data*, a full credit course for undergraduate students majoring or minoring in Biology and Biology graduate students.
Aug 2018	One full-day workshop on generalised additive models at the Ecological Society of America Annual Meeting in New Orleans, Washington, USA.
Aug 2017	One full-day workshop on generalised additive models and one half-day workshop on vegetation analysis using the vegan R package at the Ecological Society of America Annual Meeting in Portland, Washington, USA.
Feb 2017	8-day course in applied statistics for palaeoecologists and earth scientists at Department of Earth Science, University of Adelaide, Australia.
Aug 2016	One full-day workshop on generalised additive models and one half-day workshop on vegetation analysis using the vegan R package at the Ecological Society of America Annual Meeting in Fort Lauderdale, Florida, USA.
Aug 2015	One half-day introduction to R workshop and two half-day workshops on vegetation analysis using the vegan R package at the Ecological Society of America Annual Meeting in Baltimore, Maryland, US.
Aug 2014	Two half-day workshops on vegetation analysis using the vegan R package at the Ecological Society of America Annual Meeting in Sacramento, California, US.

May 2014	Two half-day workshops on introductions to R for ecologists and the vegan R package at Canadian Society of Ecology and Evolution Annual Meeting, Saskatoon, Canada.
Feb 2014	Half-day workshop “A brief introduction to R for biologists” at the 2013 Prairie Universities Biology Symposium, University of Regina.
May 2013	4-day course in applied statistics and R for School of Geography and Earth Science, McMaster University, Ontario, Canada.
Aug 2012	*Analysing palaeoenvironmental data using R*. 4-day residential R course taught jointly with Steve Juggins (Newcastle University), Cumbrae, Scotland.
Jun 2012	*Vegan Workshop*. Training course on the Vegan package for R for the Centres for Ecology and Hydrology, Wallingford, UK.
Jan – Feb 2012	*Time Series Analysis*. Two R-based research level training courses for the Centres for Ecology and Hydrology, Lancaster and Wallingford, UK.
Oct 2011	*Analogue methods and space-for-time substitution for statistical downscaling of climate models*. Lecture and computer class taught as part of a one-week PhD level course at the Technical University of Denmark (DTU).
Feb 2010	One week invited course on advanced regression and multivariate techniques at the Department of Ecology, Stockholm University, Sweden. Masters and Doctoral student level.
2010 to 2012	Lecture and computer classes on time series data analysis. M.Sc. Aquatic Sciences, Monitoring Core Module.
2009	Two, one-day workshops on time series analysis and multivariate methods. Centre for Ecology and Hydrology, Wallingford.
Sept 2008	One week invited course on advanced regression techniques at the Department of Biology, Swedish University of Agricultural Sciences, Uppsala. Doctoral student level.
Sept 2007	One week invited course on advanced multivariate statistics at the Department of Environmental Assessment, Swedish University of Agricultural Sciences, Uppsala. Doctoral student level.
Dec 2006	One week invited course on univariate and multivariate statistics at University of Joensuu, Finland. Doctoral and post-doctoral level.
2006 – 2009	Lecture and computer practical classes on analysing monitoring data. M.Sc. Freshwater and Coastal Sciences, Monitoring Core Module.
2005 to 2012	Convenor of course and lead lecturer on the ECRC short course 'Numerical analysis of biological and environmental data'. Masters, doctoral and post-doctoral level.
2004	One day invited course on multivariate data analysis using Canoco at University of Reading. Postgraduate and doctoral students, staff.
2002 to 2012	Lecture class and computer practical on introduction to multivariate analysis as part of GEOG2007 Ecological Patterns and Processes undergraduate course.

Peer review

Since October 2020 I have served on the editorial board of *Methods in Ecology and Evolution* as an Associate Editor.

I previously served as Editor for the *R* Journal (2021–2022), on the editorial board of Springer Nature’s open data journal, *Scientific Data*, as an Associate Editor (2013-2022). In July 2020, I was recognised by the Chief Editor, Andrew Hufton, as one of the most active Editorial Board Members for Scientific Data.

Between 2015 and 2020 I served as an Associate Editor for *Frontiers in Ecology and Evolution* for the Paleoecology section. In 2019, I was invited to serve as an Associate Editor for the new *Models in Ecology and Evolution* section of *Frontiers in Ecology and Evolution*, serving until 2022.

Between 2017 and 2020 I served as a panel member on Evaluation Group 1503 Ecology and Evolution for NSERC Discovery Grants. I typically evaluated 45-55 Discovery Grant applications in each of the three years I was on the panel.

Peer reviewer of an sDiv grant for the German Centre for Integrative Biodiversity Research (iDiv) (Germany, 2020)

Peer reviewer for the following journals; *Nature Ecology and Evolution*, *Nature Communications*, *Ecology Letters*, Nature Geoscience, *Limnology and Oceanography*, *Journal of Vegetation Science*, *Journal of Paleolimnology*, *Journal of Applied Ecology*, *Palaeogeography, Palaeoclimatology, Palaeoecology*, *Water Research*, *Palynology*, *European Journal of Phycology, Journal of Environmental Management, Journal of Biogeography, Aquatic Ecology, Ecological Modelling, Hydrobiologia, Journal of Hydrometeorology, Journal of the Royal Society of New Zealand, Methods in Ecology and Evolution, Palynology, Science of the Total Environment, The Holocene, Freshwater Biology, Ecosystems, Proceedings of the Royal Society B, Aquatic Sciences, Ecography, Ecological Indicators, Ecology, Ecosphere, Journal of Quaternary Science, Limnology & Oceanography Letters, Quaternary Science Reviews, Open Quaternary, Palaeogeography, Palaeoclimatology, Palaeoecology, Freshwater Science, Journal of Agricultural and Environmental Statistics, Facets, Canadian Journal of Fisheries and Aquatic Sciences, BioScience, Biologia*.

Peer review of book chapters and book proposals for CRC Press, SAGE, Springer, Cambridge University Press, and John Wiley and Sons.

Peer reviewer of NERC Small and Standard research grants (UK).

Presentations

Invited Talks

June 2025 *(almost) Everything you thought you knew about statistics is wrong**, Early Career Seminar series, Department of Molecular Biology and Genetics, June 10th, 2025.

May 2025 *It's wet in Aarhus, but is it getting wetter?* Pint of Science Denmark, May 19th, 2025.

December 2024 Seminar for Evolutionary Biology and Environmental Studies. Department of Evolutionary Biology and Environmental Studies, University of Zurich, Switzerland, December 17th, 2024.

May 2024 *Generalized Additive Models and gratia* – Ocean Tracking Network Virtual Study Hall, Dalhousie University, Halifax, Canada, May 23rd, 2024 (online).

May 2024 *Trends in ice cover of northern hemisphere lakes* – Water Talks, Department of Ecoscience, Aarhus University, May 2nd, 2024.

October 2023 Seminar in Advanced Research Methods, Department of Psychology, Princeton University, October 3rd, 2023.

July 2023 *Applying statistical thinking to palaeo data through generalized additive models* – Keynote presentation at XXI INQUA Congress 2023, Rome, 13-20th July.

March 2023 Detecting change in palaeoecological time series, old and new – PaleoEcoGen seminar series, online, 24th March.

March 2023 *Quantifying trends in ecological data using GAMs* – Department of Ecoscience, Aarhus University, March 8th.

November 2022 *Detecting change in a dynamic world* – School of Earth, Environment and Ecosystem Sciences Seminar Series, The Open University, 1st November.

March 2022 *Estimating trends in messy time series using generalized additive models* – Statistics & Biostatistic Seminar Series, Department of Statistics & Actuarial Science, University of Waterloo, 10th March.

February 2022 *Quantifying trends in biodiversity with generalized additive models* – National Centre for Statistical Ecology seminar series, 9th February.

January 2022 *Generalized Additive Models with R and mgcv* – Statistical Methods Seminar Series, Ecological Forecasting Initiative and Statistical Ecology Section of the Ecological Society of America, 3rd January.

November 2021 *Estimating trends in messy time series – a penalized spline approach* – Econometrics and Business Statistics Seminar Series, Aarhus University, 17th November.

October 2021 *Large Space Time Data: fitting spatio-temporal data using GAMs* – Arctic Hub (Aarhus University, University of Gothenburg, University of Edinburgh, University of Nottingham), 29th October.

October 2021 *Going beyond the mean: using distributional models to estimate changing resilience* – Center for Macroecology, Evolution, and Climate, University of Copenhagen, 8th October.

July 2020 *Estimating ecological resilience from poorly behaved time series* – Aquatic Virtual Summit: Incorporating Data Science and Open Science Techniques in Aquatic Research, 23-24 July, 2020.

June 2020 *Learning when, where, and by how much, things change* – invited talk at New York Hack R, the New York Open Statistical Programming Meetup.

June 2020 *Estimating ecological resilience from poorly behaved time series* – Association for the Sciences of Limnology and Oceanography and Society for Freshwater Science, Joint Summer Meeting 2020. (Conference Cancelled due to Covid-19.)

July 2019 *The life of a statistical ecologist* – invited talk at the Canadian Mathematical Society Summer Meeting, Regina, Canada.

November 2018 *Wiggly Things and Generic Resilience Indicators in Ecological Time series* – invited seminar at Institute for Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, Colorado, USA.

September 2018 *Ecological resilience in messy time series* – invited seminar at Department of Biology, Memorial University, St. John's, Newfoundland, Canada.

October 2017 *Spatiotemporal variation in surface waters due to global environmental change* – invited seminar at Department of Biology, York University, Toronto, Canada.

February 2017 *Modelling trends, change points, and related features in palaeoenvironmental time series using generalised additive models* – invited seminar at Department of Earth Sciences, University Adelaide, Australia.

August 2015 *Patterns of Ecological Response to Environmental Change as Observed in Palaeoecological data* – invited talk at Ecological Society of America's Annual Meeting, Baltimore, US.

December 2011 Invited to talk at the Fall Meeting of the American Geophysical Union. 4th - 9th December 2011. *Evidence of Rapidly Warming Rivers in the UK from an Extensive Additive Modelling Study at the National Scale Using R.*

November 2009 *Are remote fresh water ecosystems succumbing to the Nitrogen Cascade?* Presentation at 'Nitrogen Deposition, Critical Loads and Biodiversity' conference, Edinburgh, UK, 16th - 18th November 2009.

November 2008 *Altered nitrogen biogeochemistry in oligotrophic lakes: a palaeolimnological perspective*. London Freshwater Group, November 2008.

March 2007 *Identifying patterns of change in noisy water chemistry time series data.* Presentation at ICMS Workshop "Workshop on smoothing based and Gaussian-process-based methods for non-parametric regression in environmental problems", 26-29th March 2007.

May 2005 *Does size really matter? Effect of training set size on model performance and species estimates.* Talk at seminar afternoon in honour of H.J.B. Birks.

May 2004 *Freshwater ecosystems: past, present and future.* Presentation to the Environmental Statistics Study Group of the Royal Statistical Society.

Conference Presentations

(*) as presenting author

2024 (*) Rank abundance curves redux – International Statistical Ecology Conference, Swansea, UK, July 15-19, 2024

2023 (*) *Loss of lake ice cover in northern hemisphere lakes* – Circle U Climate Change & Water Seminar. Humboldt Universität, Berlin, Germany, June 6, 2023.

2022 (*) *Quantifying trends in biodiversity with generalized additive models* – Joint Ecological Society of America and Canadian Society of Ecology and Evolution Annual Meeting, Montreal, 14-19 August 2022.

2020 (*) *Estimating the time-varying correlation between time series using copula distributional models* – Virtual International Statistical Ecology Conference (vISEC) 2020

2020 *A big data approach to understanding change in lake ice occurrence and duration in the northern hemisphere over the last two centuries* – Aquatic Virtual Summit: Incorporating Data Science and Open Science Techniques in Aquatic Research, 23-24 July 2020.

2020 *Seasonal CO_2, CH_4, and N_2O emissions from farm ponds in the northern Great Plains* – CCFFR-SCL 2020, Halifax, Nova Scotia.

2019 (*) *Estimating continuous measures of ecological resilience from palaeoecological time series* – International Quaternary Association Congress 2019, Dublin, Ireland.

2019 (*) *Palaeolimnologists must rethink their approach to data analysis* – PALS 2019, University of Waterloo, Waterloo, Canada.

2018 (*) *Species associations and long-term dynamics in phytoplankton communities* – Ecological Society of America Annual Meeting 2018, New Orleans, USA.

2018 (*) *Using topic models to describe disturbance & quantify responses to environmental change* – International Statistical Ecology Conference 2018, St Andrews, Scotland.

2018 (*) *Estimating rates and magnitudes of temporal change: Using generalized additive models with stratigraphic records* – International Paleolimnology Symposium 2018, Stockholm, Sweden.

2018 *Spatial variations in snowpack chemistry and isotopic composition of nitrate along a nitrogen deposition gradient in West Greenland* – European Geosciences Union General Assembly 2018, Vienna, Austria.

2018 *Agricultural Dugouts as Sources or Sinks for Greenhouse Gases: a Spatial Assessment in Southern Saskatchewan*. Society of Canadian Limnologists 2018 meeting, Edmonton, Canada.

2017 *Seasonal Variations in CO_2 Flux of Hard-Water Lakes in the Northern Great Plains* – Association for the Sciences of Limnology and Oceanography Aquatic Sciences Meeting 2017.

2017 (*) *Using topic models to describe disturbance and quantify responses to environmental change in palaeoecological time series*. Ecological Society of America Annual meeting, Portland, USA.

2017 *Regulation of Lake Production and Phytoplankton Community Composition by Fluxes of Nitrogen – a Synthesis of 25 Years of Ecosystem Ecology* – Association for the Sciences of Limnology and Oceanography Aquatic Sciences Meeting 2017.

2017 *Climatic and Urban Control of the Timing and Magnitude of Microcystin Peaks in Hardwater Eutrophic Lakes* – Association for the Sciences of Limnology and Oceanography Aquatic Sciences Meeting 2017.

2017 *Quantifying the Relative Effects of Climate and Catchment Controls Upon Isotopic Mass Balances in Lakes of the North American Great Plains* – Association for the Sciences of Limnology and Oceanography Aquatic Sciences Meeting 2017.

2016 (*) *Estimating Temporal Change in Mean and Variance of Community Composition via Location Scale Additive Models* at Ecological Society of America's Annual Meeting, Fort Lauderdale, US.

2016 (*) *Estimating Temporal Change in Mean and Variance of Community Composition via Location Scale Additive Models* at the International Statistical Ecology Conference, Seattle, US.

2016 *Differential Changes in Boreal Lake Phytoplankton Communities Resulting from Climate Change and Athabasca Oil Sands Emissions* – Association for the Sciences of Limnology and Oceanography Summer Meeting 2016.

2016 *Evaluation of the Role of Nitrogen Fixation in Meeting the Nitrogen Demands of Phytoplankton Communities in Eutrophic Lakes* – Association for the Sciences of Limnology and Oceanography Summer Meeting 2016.

2016 *Temporal variation in the relative importance of pH and lake metabolism on atmospheric CO2 exchange in hardwater* – Association for the Sciences of Limnology and Oceanography Summer Meeting 2016.

2016 *Quantification of hydrological variability in riverine lakes using stable isotopes of water* – Association for the Sciences of Limnology and Oceanography Summer Meeting 2016.

2016 *The roles of nitrogen deposition and climate change on zooplankton assemblages in lake sediments downwind of the Athabasca Oil Sands region* – Association for the Sciences of Limnology and Oceanography Summer Meeting 2016.

2015 (*) *Patterns of Ecological Response to Rapid Environmental Change* – talk at Canadian Society for Ecology and Evolution Annual Meeting, Saskatoon, Canada.

2009 (*) Oral presentation at INI workshop on Nitrogen Deposition, Critical Loads and Biodiversity, Edinburgh, UK.

2009 (*) Oral presentation at the ASLO Winter meeting, Nice, France.

2007 (*) Oral presentation at 4th International Nitrogen Conference, Brazil.

2006 (*) Oral presentations at the Aquatic Sciences meeting of ASLO, Victoria, Canada and at the 10th International Paleolimnology Symposium, Duluth, USA.

2005 (*) Poster presentation at Acid Rain 2005, Prague, Czech Republic.

2003 (*) Oral presentations at the 9th International Paleolimnology Symposium, Helsinki, Finland, and at the Royal Geographical Society annual conference.