

PIETER AUKES

Postdoctoral Fellow, WLU

CONTACT INFORMATION

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EDUCATION

Doctor of Philosophy – Earth Sciences (Water) 2013 - 2019

University of Waterloo, Waterloo, ON

- Thesis: 'Dissolved Organic Matter in the Canadian Arctic & Sub-Arctic: Importance of DOM Quality & Quantity in a Warming Climate'
- Supervisor: Dr. Sherry Schiff, Dr. Michael English
- Part of the Collaborative Water Program

Master of Science – Hydrogeology & Geochemistry 2010 - 2012

University of Waterloo, Waterloo, ON

- Thesis: 'Characterization of Dissolved Organic Matter Using a Liquid Chromatography – Organic Carbon Detection from a Variety of Surface and Ground Water Environments'
- Supervisor: Dr. Sherry Schiff

Bachelor of Science (Hons.) – Environmental Geosciences 2006 - 2010

University of Calgary, Calgary, AB

- Thesis: 'Groundwater Connection between an Alpine Lake and a Spring Complex and the Transport of Copepods'
- Supervisor: Dr. Masaki Hayashi

SCHOLARSHIPS & AWARDS

Ontario Graduate Scholarship (\$15,000) 2011 - 2012; 2017 - 2018

Government of Ontario

President's Scholarship (\$10,000) 2011 - 2012; 2017 - 2018

University of Waterloo

W. Garfield Weston Award for Northern Research (\$50,000) 2015 - 2017

W. Garfield Weston Foundation

Golder Associates Graduate Scholarship in Water (\$5,000) 2016

Golder Associates, Waterloo

Queen Elizabeth II Graduate Scholarship in Science & Technology (\$15,000) 2014 - 2015

University of Waterloo

Provost Graduate Entrance Scholarship (\$15,000) 2013 - 2014

University of Waterloo

Jason Lang Scholarship (\$1,000) 2008 - 2009

University of Waterloo

International Association of Geochemistry – Student Research Award (\$1,000) 2013

International Association of Geochemistry

Best Poster: Arctic Sciences - Water Institute Research Symposium (\$500) 2015

Water Institute, University of Waterloo

Best Oral Presentation – Due North: Next Generation Arctic Research & Leadership (\$300) 2015

ACUNS 2015 Student Conference, Calgary, AB

RESEARCH & WORK INTERESTS

- Quantify climate-driven changes to water geochemistry
- Use of geochemical and isotopic tools to further process-based knowledge
- Open source, accessible, and reproducible workflow pathways
- Efficient and novel management of compiled databases

RESEARCH EXPERIENCE

Postdoctoral Fellow

2019 - Present

Wilfrid Laurier University, Waterloo, ON

- Part of the Sub-Arctic Metals Mobility Study led by Dr. Brent Wolfe, Dr. Jason Venkiteswaran, & Dr. Michael English
- Assess the impact of climate change on the transport of legacy-based pollutants among the sub-arctic taiga shield
- Quantify the importance of organic matter quantity and quality and how it affects metal transport in these systems

Field & Laboratory Research Assistant

2012 - 2019

University of Waterloo, Waterloo, ON

- Determine how differences in land use (agriculture & urbanization) impact river health over all seasons using geochemical and stable isotopes
- Responsible for numerous wet chemistry and stable isotopic techniques needed for analysis
- Maintained and taught use of analytical equipment to students

Hydrogeology Summer Research Assistant

2008 – 2010

University of Calgary, Calgary, AB

- Supported geophysical and hydrological research projects at Lake O'Hara
- Conducted routine hydrological measurements for snow and hot spring discharge in Banff National Park
- Responsible for data collection, organization, and input into electronic databases

TEACHING EXPERIENCE

Guest Lecturer

Introduction to Geology, Geography & Environmental Studies, Wilfrid Laurier University

2020

- Provided lectures on a range of geological introductory topics

Under-Ice Lake Sampling, Nunavut Arctic College

2016

- Taught field-based winter limnological sampling techniques to a group of students outside of Iqaluit, NU

Teaching Assistant

Hydrogeology Field School, Earth & Environmental Sciences, University of Waterloo

2018; 2019

- Intensive 3-week field school demonstrating key introductory concepts and field techniques to students
- Responsible for organization of multiple field-based demonstrations, health and safety, and student concerns

Sedimentology & Stratigraphy, Earth & Environmental Sciences, University of Waterloo

2010; 2011

- Conducted tutorials to practice key introductory concepts and principles
- Aided students in conceptualizing geological maps, 3-D visualization, and creation of cross-sections

PUBLICATIONS

Peer-Reviewed Articles

St Pierre, K. A., V. L. St. Louis, S. L. Schiff, I. Lehnerr, P. G. Dainard, A. S. Gardner, P. J. K. Aukes, & M. J. Sharp. 2019. Proglacial freshwaters are significant and previously unrecognized sinks of atmospheric CO₂. *Proceedings of the National Academy of Sciences* 116(36): 17690-17695. doi: 10.1073/pnas.1904241116

Aukes, P. J. K., S. L. Schiff, & W. D. Robertson. 2019. Evolution of Dissolved Organic Matter Along a Septic System Plume: Evidence of Sustained Biogeochemical Activity in the Groundwater Zone. *Journal of Geophysical Research: Biogeosciences* 124. doi: 10.1029/2018JG004758.

Hutchins, R. H. S., P. J. K. Aukes, S. L. Schiff, T. Dittmar, Y. T. Prairie, & P. A. del Giorgio. 2018. The Optical, Chemical, and Molecular Dissolved Organic Matter Succession Along a Boreal Soil-Stream-River Continuum. *Journal of Geophysical Research: Biogeosciences* 122: 289-2908. doi: 10.1002/2017JG004094.

In-Prep. Publications

Aukes, P. J. K., S. L. Schiff, J. J. Venkiteswaran, R. J. Elgood, & J. Spoelstra. 2020. Hydrologic Compartments are More Important than Ecozone in Size-Based Characterization of Freshwater Dissolved Organic Matter across Canada. Submitted to: *Limnology & Oceanography Letters*.

Aukes, P. J. K. and S. L. Schiff. 2020. Composition Wheels: Visualizing dissolved organic matter using common composition metrics across a variety of Canadian Ecoregions. Submitted to: *PLOS ONE*.

Aukes, P. J. K., S. L. Schiff, & J. J. Venkiteswaran. Dissolved organic matter quality over quantity when assessing disinfection by-products formation from three sub-arctic sites in Northwest Territories, Canada. In-prep for *Water Research X*.

Aukes, P. J. K., M. C. English, J. Leathers, M. Schultz, R. J. Elgood, J. J. Venkiteswaran, & S. L. Schiff. Wet and Dry Years Have Distinct Changes to DOM Concentration and Composition in Canadian Sub-Arctic Taiga Shield Lakes. In prep for *Science of the Total Environment*.

Non-refereed Publications

Aukes, P. J. K., S. L. Schiff, M. Palmer, & R. Staples. 2020. Trends in Water Quality from Three Rivers in the North Slave Region from 30+ Years of Monitoring. For: *NWT State of the Environment Report 2020*.

CONFERENCES

Presentations (bold indicates presented)

Aukes, P. J. K. 2019. Looking at Dissolved Organic Matter in the Northwest Territories. Cold Region Research Centre Invited Talk, Waterloo, ON.

Aukes, P. J. K., Schiff, S. L., English, M. C., Staples, R., & M. Palmer. 2019. Water Quality Trends in Three Rivers near Yellowknife, NT, Canada. Plenary Talk at 22nd Northern Research Basin Symposia/Workshop – Partners in Learning, Yellowknife, NT.

Aukes, P. J. K., Venkiteswaran, J. V., Schiff, S. L., & M. C. English. 2019. Examining the Relationship between Dissolved Organic Matter & Disinfection By-Products in the Northwest Territories. Global Water Futures Annual Scientific Meeting, Saskatoon, SK.

Aukes, P. J. K., Dainard, P., Schiff, S. L., & English, M. C. 2017. How measures of dissolved organic matter quality change from Yellowknife NT to Lake Hazen NU. ArcticNet Annual Scientific Meeting, Quebec City, QC.

Dainard, P., Schiff, S. L., Aukes, P. J. K., Elgood, R. J., St. Pierre, K., St. Louis, V. L., English, M. C. & I. Lehnherr. 2017. Dissolved organic and inorganic carbon dynamics in glacial river systems of the Canadian high arctic. ArcticNet Annual Scientific Meeting, Quebec City, QC.

Schiff, S. L., Muir, D. C. G., Aukes, P. J. K., Dainard, P., Elgood, R. J., St. Louis, V. L., & I. Lehnherr. 2017. Are young fish 14C "old" in the northern most great lake: Lake Hazen in the high arctic?. ArcticNet Annual Scientific Meeting, Quebec City, QC.

Aukes, P. J. K., Schiff, S. L., English, M. C., & R. J. Elgood. 2016. Dissolved Organic Matter, Disinfection Demand, and Northern Drinking Water. ArcticNet Annual Scientific Meeting, Winnipeg, MB.

Dainard, P., Schiff, S. L., Aukes, P. J. K., English, M. C., St. Louis, V., Lehnherr, I., Elgood, R. J., & K. St. Pierre. 2016. Cycling of Dissolved Organic Matter in Permafrost and Glacial Melt Water Impacted Freshwater Systems of the Canadian Arctic. ArcticNet Annual Scientific Meeting, Winnipeg, MB.

Aukes, P. J. K., Schiff, S. L., English, M. C., & R. J. Elgood. 2015. Using Photolytic and Microbial Degradation Experiments to Understand the Quality of Dissolved Organic Matter around Yellowknife, Northwest Territories. ArcticNet Annual Scientific Meeting, Vancouver, BC.

Hickman, J., English, M. C., Aukes, P. J. K., & S. L. Schiff. 2015. Seasonal Evolution of active layer formation in subarctic peat plateaux and implications for dissolved organic matter composition and transfer. ArcticNet Annual Scientific Meeting, Vancouver, BC.

Schiff, S. L., Aukes, P. J. K., English, M. C., St. Louis, V. L., Lehnherr, I., Elgood, R. J., & K. A. St. Pierre. 2015. Lake Hazen Watershed: A surrogate for assessing changes in terrestrial inputs to the nearshore marine coastal zone in the high arctic. ArcticNet Annual Scientific Meeting, Vancouver, BC.

Aukes, P. J. K., Schiff, S. L., English M. E., & R. J. Elgood. 2015. Comparing Dissolved Organic Matter Quality from a High Arctic (Lake Hazen, NU) and Subarctic (Yellowknife, NWT) Environment. ACUNS Student Conference, Calgary, AB.

Aukes, P. J. K., Schiff, S. L., English M. E., & R. J. Elgood. 2015. Dissolved Organic Matter and the Warming North – DOM quality from an area with discontinuous permafrost. AGU-CGU Joint Assembly, Montreal, QC.

Aukes, P. J. K., Schiff, S. L., & M. English. 2014. How Different is Dissolved Organic Matter in a Discontinuous Permafrost Area around Yellowknife, NWT?. Arctic Change 2014 Conference, Ottawa, ON.

Refereed Poster

Aukes, P. J. K., Schiff, S. L., English, M. C., & I. Lehnherr. 2017. Can water isotopes be used to determine photolytic history of dissolved organic matter in high arctic ponds?. ArcticNet Annual Scientific Meeting, Quebec City, QC.

Wisniewski, V., Lehnherr, I., Schiff, S. L., Aukes, P. J. K., & J. L. Kirk. 2017. Impacts of a warming arctic on freshwater ecosystem productivity, processes, and resources. ArcticNet Annual Scientific Meeting, Quebec City, QC.

Aukes, P. J. K., Schiff, S. L., English, M. C., & R. J. Elgood. 2016. Geochemical Trends over 30 Years in Three Rivers near Yellowknife, NWT. ArcticNet Annual Scientific Meeting, Winnipeg, MB.

Lehnherr, I., St. Louis, V., Schiff, S. L., Venkiteswaran, J. J., St. Pierre, K., Emmerton, C., Aukes, P. J. K., & V. Wisniewski. 2016. Comparative Limnology of Lakes and Ponds in the Lake Hazen Watershed during Ice-covered and Ice-free Seasons: What are the implications of climate change for the carbon and nutrient cycles in freshwater ecosystems? ArcticNet Annual Scientific Meeting, Winnipeg, MB.

Schiff, S. L., Aukes, P. J. K., Dainard, P., English, M. C., Elgood, R. J., Zheng, X., St. Louis, V., Lehnherr, I., & K. St. Pierre. 2016. Lake Hazen Watershed in the high arctic: Using tritium and natural abundance stable isotopes of sulfate to partition changing inputs from glacial rivers. ArcticNet Annual Scientific Meeting, Winnipeg, MB.

Wisniewski, V., Lehnherr, I., Schiff, S. L., Aukes, P. J. K., & J. Kirk. 2016. The metabolism of Skeleton Lake, Northern Ellesmere Island, Nunavut: Understanding the effects of climate change in the Canadian high arctic by quantifying biological processes. ArcticNet Annual Scientific Meeting, Winnipeg, MB.

Aukes, P. J. K., Schiff, S. L., English, M. C., & R. J. Elgood. 2015. High Arctic Experiments: Photolytic and Microbial Degradation of Dissolved Organic Matter. ArcticNet Annual Scientific Meeting, Vancouver, BC.

Lehnherr, I., Venkiteswaran, J. J., St. Louis, V., Schiff, S. L., Emmerton, C., St. Pierre, K., Wong, C., Aukes, P. J. K., & R. J. Elgood. 2015. Ecosystem metabolism in high arctic ponds in the Lake Hazen Watershed, Quttinirpaaq National Park (Nunavut). ArcticNet Annual Scientific Meeting, Vancouver, BC.

Aukes, P. J. K., Hutchins, R. S., Elgood, R.J., & S. L. Schiff. 2014. Characterization of Dissolved Organic Matter Composition and Quality along the Grand River. International Association for Great Lakes Research (IAGLR).

Aukes, P. J. K., Schiff, S. L., & M. C. English. 2014. Characterization of Dissolved Organic Matter from Discontinuous Permafrost Areas. Canadian Conference for Fisheries Research – Society of Canadian Limnologists.

Schiff, S. L., Venkiteswaran, J. J., Aukes, P. J. K., & R. J. Elgood. 2013. Dissolved Organic Matter at ELA: Effects of Photolysis on DOM and CO₂ Isotopes and DOM Quality. Canadian Conference for Fisheries Research – Society of Canadian Limnologists.

Non-Refereed Talks

Aukes, P. J. K., Dainard, P., Schiff, S. L., & English, M. C. 2016. "Wekweèti & Dissolved Organic Carbon". Talk given to the community of Wekweèti on updates and progress of research in their community. Wekweèti, NT.

Aukes, P. J. K. 2016. "It Snows or Rains; Then what? – Looking at Water Quality in the Arctic". Talk given to Grades 6 – 9 at the Alexis Arrowmaker School, Wekweèti, NT.

Non-Refereed Poster

Aukes, P. J. K., Schiff, S. L., & M. C. English. 2014. Dissolved Organic Matter and Water Quality in the North – What is the Quality of DOM around Yellowknife, NWT?. World Water Day Symposium – Water Institute. University of Waterloo, Waterloo, ON.

Hickman, J., Aukes, P., English, M. C., Schiff, S., Kokelj, S. V., & C. Spence. 2013. Seasonal Evolution of Active Layer Formation in Peat Plateaus and Implications for Shallow Groundwater Chemistry. Northwest Territories Cumulative Impact Monitoring Program Annual Meeting.

PROFESSIONAL AFFILIATIONS & DEVELOPMENT

Affiliations

Society of Canadian Limnologists (SCL)

Association of the Sciences of Limnology & Oceanography (ASLO)

Development

Fundamentals of University Teaching – *Centre for Teaching Excellence, University of Waterloo*

SERVICE EXPERIENCE

Academic

Student Co-Supervisor 2019 - Present
Wilfrid Laurier University / University of Waterloo

President, Earth Science Graduate Association (ESGA) 2011 - 2012
University of Waterloo

Executive, Environmental Science Students Association (ESSA) 2009 - 2010
University of Calgary

LANGUAGES

- English, Dutch