

Paul C. Frost

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Department of Biology

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Professional Positions

Director (Acting). 2021-present

Institute of Watershed Science, Trent University, Peterborough, Ontario

Professor. 2017-present

Department of Biology, Trent University, Peterborough, Ontario

Associate Professor. 2013-2017

Department of Biology, Trent University, Peterborough, Ontario

Assistant Professor. 2010-2013

Department of Biology, Trent University, Peterborough, Ontario

Assistant Professor (Limited term). 2007-2010

Department of Biology, Trent University, Peterborough, Ontario

Postdoctoral Research Associate. 2002-2005

Department of Biological Sciences, University of Notre Dame, Notre Dame, Indiana

Education

Ph.D. Biology. *Arizona State University, Tempe, Arizona.* 2001

Ecological stoichiometry of trophic interactions in the benthos of boreal lakes.

Advisor: James J. Elser

M.S. Zoology. *The Ohio State University, Columbus, Ohio.* 1997

Zooplankton in western Lake Erie: Before and after zebra mussels.

Advisor: David A. Culver

B.S. Biological Sciences. *University of Rochester, Rochester, New York.* 1995

Honors and Awards

- Returning Fellowship for Experienced Researchers. 2017. Alexander von Humboldt Foundation.
- Sustaining Fellow. 2017. Association for the Sciences of Limnology and Oceanography.
- Fellowship for Experienced Researchers. 2011. Alexander von Humboldt Foundation.
- Rosemary Mackay Fund Award. 2002. North American Benthological Society.
- Graduate Academic Scholarship. 2000. Arizona State University.
- National Science Scholarship. 1991-1995. United States Department of Education.
- Bausch and Lomb Scholarship. 1991-1995. University of Rochester.
- Valedictorian. 1991. Nyssa High School.

Research Interests

- Ecological Stoichiometry
- Indicators of Nutritional Stress
- Nutrients in the Environment

Peer-Reviewed Publications (111 total)

- Jones, C.L.C., A.B.A Shafer and **P.C. Frost**. 2023. Characterizing nutritional phenotypes using experimental nutrigenomics: Is there nutrient-specificity to different types of dietary stress? *Molecular Ecology* 32: 1073-1086. (doi: 10.1111/mec.16825)
- Frost, P.C.**, N.J.T Pearce, S.A. Berger, M.O. Gessner, A.K. Makower, V. Marzetz, J.C. Nejstgaard, A. Pralle, S. Schällicke, A. Wacker, N.D. Wagner, and M.A. Xenopoulos. In press. Interactive effects of nitrogen and phosphorus on growth and stoichiometry of lake phytoplankton. *Limnology and Oceanography* 68: 1172-1184
- Pearce, N.J.T., J.H. Larson, M.A. Evans, S.W. Bailey, **P.C. Frost**, W.F. James and M.A. Xenopoulos, M.A. In press. Dissolved organic matter transformations in a freshwater rivermouth. *Biogeochemistry* 163: 245-264
- Williams, C.J., **P.C. Frost**, B.K. Ginn, J. Marsalek and M.A. Xenopoulos. In press. Add a dash of salt? Effects of road de-icing salt (NaCl) on benthic respiration and nutrient fluxes in freshwater sediments. *Limnetica* 42: 233-250
- Costello, D.M., S.D. Tiegs, L. Boyero, C. Canhoto, K.A. Capps, M. Danger, **P.C. Frost**, et al. 2022. Global patterns and controls of nutrient immobilization on decomposing cellulose in riverine ecosystems. *Global Biogeochemical Cycles*, 36, e2021GB007163. <https://doi.org/10.1029/2021GB007163>
- Wagner, N.D., D.B. Simmons, C. Prater and **P.C. Frost**. 2022. Proteome changes in an aquatic invertebrate consumer in response to different nutritional stressors. *Oecologia* 199: 329–341. <https://doi.org/10.1007/s00442-022-05198-5>
- Pearce, N.J.T., D.E. Spooner, J.M. Plourde, H.F. Wilson, **P.C. Frost** and M.A. Xenopoulos. 2021. Association between subcatchment land cover and ecological stoichiometry along a human modified stream network. *Frontiers in Water* 3: 69
- Rice, M.J., C.L.C. Jones, C.W.E. Starke and **P.C. Frost**. 2021. Calcium stress in *Daphnia pulicaria* and exposure to predator-derived cues: Making a bad situation worse? *Freshwater Science* 40: 449-462.
- Pearce, N.J.T., J.H. Larson, M.A. Evans, **P.C. Frost** and M.A. Xenopoulos, M.A. 2021. Episodic nutrient addition affects water column nutrient processing rates in river-to-lake transitional zones. *Journal of Geophysical Research: Biogeosciences* e2021JG006374. <https://doi.org/10.1029/2021JG006374>
- Musial, K.A., C. Prater, S.B. Watson, **P.C. Frost** and M.A. Xenopoulos. 2021. Lipid bound phosphorus in the seston of Lake Erie and its tributaries and its use as an indicator of algal P-limitation. *Aquatic Sciences* 83: 49
- Starke, C.W.E., C.L.C. Jones, W.S. Burr and **P.C. Frost**. 2021. Interactive effects of water temperature and stoichiometric food quality on *Daphnia pulicaria*. *Freshwater Biology* 66: 256-265. <https://doi.org/10.1111/fwb.13633>
- Larson, J.H., M.A. Evans, F.A. Fitzpatrick, **P.C. Frost**, M.A. Xenopoulos, W.F. James and P.D. Reneau. 2021. Benthic and pelagic inorganic nutrient processing rates at the interface between a river and lake. *Biogeochemistry* 155: 189-203.
- Peace, A., **P.C. Frost**, N.D. Wagner, M. Danger, C. Accolla, P. Antczak, B.W. Brooks, D.M.

- Costello, R.A. Everett, K.B. Flores, C.M. Heggerud, R. Karimi, Y. Kang, Y. Kuang, J.H. Larson, T. Mathews, G.D. Mayer, J.N. Murdock, C.A. Murphy, R.M. Nisbet, L. Pecquerie, N. Pollesch, E.M. Rutter, K.L. Schulz, J.T. Scott, L. Stevenson and H. Wang. 2021. Stoichiometric ecotoxicology for a multisubstance world. *BioScience* 71:132-147.
- Jones, C.L.C., A.B.A Shafer, W.D. Kim, C. Prater, N.D. Wagner and **P.C. Frost**. 2020. The complexity of co-limitation: Nutrigenomics reveal non-additive interactions of calcium and phosphorus on gene expression in *Daphnia pulex*. *Proceedings of the Royal Society B*. 287: 20202302. <http://doi.org/10.1098/rspb.2020.2302>
- DeGasparro, S.D., D.V. Beresford, C. Prater and **P.C. Frost**. 2020. Leaf litter decomposition in boreal lakes: variable mass loss and nutrient release ratios across a geographic gradient. *Hydrobiologia* 847: 819-830. doi:10.1007/s10750-019-04140-w
- Minelgaite, G., **P.C. Frost**, M.A. Xenopoulos, D.A. Stephansen, M.L. Fejerskov and J. Vollertsen. 2020. Planktonic algae abundance and diversity are similar in urban stormwater ponds of different geographic locations and natural shallow lakes. *Urban Ecosystems* 23: 841-850. <https://doi.org/10.1007/s11252-020-00967-7>
- Larson, J.H., W.F. James, F.A. Fitzpatrick, **P.C. Frost**, M.A. Evans, P.C. Reneau and M.A. Xenopoulos. 2020. Phosphorus, nitrogen and dissolved organic carbon fluxes from sediments in freshwater rivermouths entering Green Bay (Lake Michigan; USA). *Biogeochemistry* 147: 179-197. doi:10.1007/s10533-020-00635-0
- Norman, B.C, **P.C. Frost**, G.C. Blakelock, S.N. Higgins, M.E. Hoque, J.L. Vincent, K. Cetinic and M.A. Xenopoulos. 2019. Muted responses to Ag accumulation by plankton to chronic and pulse exposure to silver nanoparticles in a boreal lake. *FACETS* 4: 566-583. doi:10.1139/facets2018-0047
- Bell, A.T., D.L. Murray, C. Prater and **P.C. Frost**. 2019. Fear and food: Effects of predator-derived chemical cues and stoichiometric food quality on *Daphnia*. *Limnology and Oceanography* 64: 1706-1715.
- Narr, C.F., D. Ebert, G. Bastille-Rousseau and **P.C. Frost**. 2019. Nutrient availability affects the prevalence of a microsporidian parasite. *Journal of Animal Ecology* 88: 579-590.
- Frost, P.C.**, C. Prater, A.B. Scott, K. Song and M.A. Xenopoulos. 2019. Mobility and bioavailability of sediment phosphorus in urban stormwater ponds. *Water Resources Research* 55: 3680-3688.
- Larson, J.H., M.A. Evans, F.A. Fitzpatrick, **P.C. Frost**, S. Bailey, R. Kennedy, W.F. James, W.B. Richardson and P.C. Reneau. 2019. Water column nutrient processing rates in rivermouths of Green Bay (Lake Michigan). *Biogeochemistry* 142: 73-93.
- Tiegs, S.D., D. Costello, M. Isken, G. Woodward, et al. (152 co-authors) including **P.C. Frost**. 2019. Global patterns and drivers of ecosystem functioning in rivers and riparian zones. *Science Advances* 5: eaav0486 (DOI: 10.1126/sciadv.aav0486).
- Prater, C., N.D. Wagner and **P.C. Frost**. 2018. Seasonal effects of food quality and temperature on body stoichiometry, biochemistry, and biomass production in *Daphnia* populations. *Limnology and Oceanography* 63: 1727-1740.
- Martin, J.D., **P.C. Frost**, H. Hintelmann, K. Newman, M.J. Paterson, L. Hayhurst, M.A.

- Xenopoulos, V. Yargeau and C.D. Metcalfe. 2018. Accumulation of silver in yellow perch (*Perca flavescens*) and northern pike (*Esox lucius*) from a lake dosed with nanosilver. *Environmental Science and Technology* 52: 11114-11122.
- Rearick, D.C., L. Telgmann, H. Hintelmann, **P.C. Frost** and M.A. Xenopoulos. 2018. Spatial and temporal trends in the fate of silver nanoparticles in a whole-lake addition study. *PLoS ONE* 13(8): e201412 (doi.org/10.1371/journal.pone.0201412)
- Khattak, H.K., C. Prater, N.D. Wagner and **P.C. Frost**. 2018. The threshold elemental ratio of carbon and phosphorus of *Daphnia magna* and its connection to animal growth. *Scientific Reports* 8: 9673 (doi:10.1038/s41598-018-27758-7)
- Conine, A.L., D.C. Rearick, M.J. Paterson, M.A. Xenopoulos and **P.C. Frost**. 2018. Addition of silver nanoparticles has no long-term effects on natural phytoplankton community dynamics in a boreal lake. *Limnology and Oceanography Letters* (doi: 10.1002/lol2.10071)
- Prater, C., **P.C. Frost**, E.T. Howell, S.B. Watson, A. Zastepa, S.S.E. King, R.J. Vogt and M.A. Xenopoulos. 2017. Variation in particulate C:N:P stoichiometry across Lake Erie. *Limnology and Oceanography* 62: S194-S206.
- Conine, A.L., D.C. Rearick, M.A. Xenopoulos and **P.C. Frost**. 2017. Variable silver nanoparticle toxicity to *Daphnia* in boreal lakes. *Aquatic Toxicology* 192: 1-6.
- Banks, L.K. and **P.C. Frost**. 2017. Biomass loss and nutrient release from decomposing aquatic macrophytes: effects of detrital mixing. *Aquatic Sciences* 79: 881-890.
- Wagner, N.D., C. Prater and **P.C. Frost**. 2017. Dynamic responses of phosphorus metabolism to acute and chronic dietary phosphorus-limitation in *Daphnia*. *Frontiers in Environmental Science* 5(doi.org/10.3389/fenv)
- Prater, C., N.D. Wagner and **P.C. Frost**. 2017. Interactive effects of genotype and food quality on consumer growth rate and elemental content. *Ecology* 98: 1399-1408.
- Striebel, M., **P.C. Frost** and J.J. Elser. 2017. Biological Stoichiometry. In: *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons. DOI: 10.1002/9780470015902.a0021229
- Vincent, J.L., M.J. Paterson, B.C. Norman, E.P. Gray, J.F. Ranville, A.B. Scott, **P.C. Frost** and M.A. Xenopoulos. 2017. Chronic and pulse exposure effects of silver nanoparticles on natural lake phytoplankton and zooplankton. *Ecotoxicology* 26: 502-515.
- Loiselle, S.A., **P.C. Frost**, E. Turak and I. Thornhill. 2017. Citizen scientists supporting environmental research priorities. *Science of the Total Environment* 598: 937.
- Scott, A.B. and **P.C. Frost**. 2017. Monitoring water quality in Toronto's urban stormwater ponds: Assessing participation rates and data quality of water sampling by citizen scientists in the FreshWater Watch. *Science of the Total Environment* 592: 738-744.
- Song K., C. Winters, M.A. Xenopoulos, J. Marsalek and **P.C. Frost**. 2017. Phosphorus cycling in urban aquatic ecosystems: Connecting biological processes and water chemistry to sediment P fractions in urban stormwater management ponds. *Biogeochemistry* 132: 203-212.
- Conine, A.L. and **P.C. Frost**. 2017. Variable toxicity of silver nanoparticles to *Daphnia magna*: Effects of algal particles and animal nutrition. *Ecotoxicology* 26: 118-126.

- Wagner, N.D., Z. Yang, A.B. Scott and **P.C. Frost**. 2017. Effects of food quality on free amino acid metabolism in *Daphnia*. *Aquatic Sciences* 79: 127-137.
- Blakelock, G.C., M.A. Xenopoulos, B.C. Norman, J.L. Vincent and **P.C. Frost**. 2016. Effects of silver nanoparticles on bacterioplankton in a boreal lake. *Freshwater Biology* 61: 2211-2220.
- Larson, J.H., **P.C. Frost**, J.M. Vallazza, J.C. Nelson and W.B. Richardson. 2016. Do rivermouths alter nutrient and seston delivery to the nearshore? *Freshwater Biology* 61: 1935-1949.
- Narr, C.F. and **P.C. Frost**. 2016. Exploited and excreting: Parasite type affects host nutrient recycling. *Ecology* 97: 2012-2020.
- Vogt, R., **P.C. Frost**, S. Nienhuis, D. Woolnough and M.A. Xenopoulos. 2016. The dual synchronizing influences of precipitation and land use on stream properties in a rapidly urbanizing watershed. *Ecosphere* 7(9):e01427.10.1002/ecs2.1427
- Ger, K.A., P. Urrutia-Cordero, **P.C. Frost**, L.-A. Hansson, O. Sarnelle, A.E. Wilson and M. Lüring. 2016. The interaction between cyanobacteria and zooplankton in a more eutrophic world. *Harmful Algae* 54: 128-144.
- Prater, C., N.D. Wagner and **P.C. Frost**. 2016. Effects of calcium and phosphorus limitation on the nutritional ecophysiology of *Daphnia*. *Limnology and Oceanography* 61: 268-278 (doi: 10.1002/lno.10208).
- Williams, C.J., **P.C. Frost**, A.M. Morales-Williams, J.H. Larson, W.B. Richardson, A.S. Chiandet and M.A. Xenopoulos. 2016. Human activities cause distinct dissolved organic matter composition across freshwater ecosystems. *Global Change Biology* 22: 613-626 (doi: 10.1111/gcb.13094)
- Narr, C.F. and **P.C. Frost**. 2015. Does infection tilt the scales? Disease effects on the mass-balance of an invertebrate nutrient recycler. *Oecologia* 179: 969-979 (doi: 10.1007/s00442-015-3412-5)
- Frost, P.C.**, K. Song, J.M. Buttle, J. Marsalek, A. McDonald and M.A. Xenopoulos. 2015. Trace metal chemistry of sediments in urban stormwater ponds. *Urban Ecosystems* 18: 763-775.
- Conine, A., E. Porter-Goff, and **P.C. Frost**. 2015. Phosphorus export from a small forested stream: Are there effects from human residential development in the riparian zone? *Fundamental and Applied Limnology* 187: 55-62.
- Song, K., M.A. Xenopoulos, J. Marsalek and **P.C. Frost**. 2015. The fingerprints of urban nutrients: Dynamics of phosphorus speciation in water flowing through developed landscapes. *Biogeochemistry* 125: 1-10.
- Furtado, L.M., B.C. Norman, M.A. Xenopoulos, **P.C. Frost**, C.D. Metcalfe, and H. Hintelmann. 2015. Environmental fate of nanoparticles in boreal lake ecosystems. *Environmental Science and Technology* 49: 8441-8450.
- Norman, B.C., M.A. Xenopoulos, D. Braun and **P.C. Frost**. 2015. Phosphorus availability alters the effects of silver nanoparticles on periphyton growth and stoichiometry. *PLoS ONE* 10: e0129328. doi:10.1371/journal.pone.0129328
- Borlestean, A., **P.C. Frost**, and D.L. Murray. 2015. A mechanistic analysis of density

dependence in algal population dynamics. *Frontiers in Ecology and Evolution* 3:37. doi: 10.3389/fevo.2015.00037

- Wagner, N.D., B.P. Lankadurai, M.J. Simpson, A.J. Simpson and **P.C. Frost**. 2015. Metabolomic differentiation of nutritional stress in an aquatic invertebrate. *Physiological and Biochemical Zoology* 88: 43-52.
- Larson, J.H., **P.C. Frost**, M.A. Xenopoulos, C.J. Williams, A.M. Morales-Williams, J. Vallazza, J.C. Nelson, and W.B. Richardson. 2014. Controls over spatial variation in dissolved organic matter change along the river to lake transition. *Ecosystems* 17: 1413-1425.
- Middleton, C.M. and **P.C. Frost**. 2014. Slow and steady wins the race: Stoichiometric and growth responses of a freshwater filamentous green alga to varying nutrient supplies. *Freshwater Biology* 59: 2225–2234.
- Furtado, L.M., M.E. Hoque, D. Mitrano, J. Ranville, B. Cheever, **P.C. Frost**, M.A. Xenopoulos, H. Hintlemann, and C.D. Metcalfe. 2014. Transformations of silver nanoparticles in lake mesocosms. *Environmental Chemistry* 11: 419-430.
- Frost, P.C.**, K. Song, and N.D. Wagner. 2014. A beginner's guide to nutritional profiling in physiology and ecology. *Integrative and Comparative Biology* 54: 873-879.
- Lukas, M., **P.C. Frost**, and A. Wacker. 2013. Neonate nutrition hypothesis: early feeding affects the body stoichiometry of *Daphnia* offspring. *Freshwater Biology* 58: 2333-2344.
- McEnroe, N.A., C.J. Williams, M.A. Xenopoulos, P. Porcal, and **P.C. Frost**. 2013. Distinct optical chemistry of dissolved organic matter in urban pond ecosystems. *PLoS ONE* 8: e80334. doi:10.1371/journal.pone.0080334
- Spooner, D.R., **P.C. Frost**, H. Hillebrand, M.T. Arts, O. Puckrin and M.A. Xenopoulos. 2013. Nutrient loading associated with agriculture land-use dampens the importance of consumer-mediated niche construction. *Ecology Letters* 16: 1115-1125.
- Williams, C.J., **P.C. Frost**, and M.A. Xenopoulos. 2013. Beyond best management practices: Pelagic biogeochemical dynamics in urban stormwater ponds. *Ecological Applications* 23: 1384-1395.
- Song, K., M.A. Xenopoulos, J.M. Buttle, J. Marsalek, N.D. Wagner, F.R. Pick and **P.C. Frost**. 2013. Thermal stratification patterns in urban ponds and their relationships with vertical nutrient gradients. *Journal of Environmental Management* 127: 317-323.
- McEnroe, N.A., J.M. Buttle, J. Marsalek, F.R. Pick, M.A. Xenopoulos and **P.C. Frost**. 2013. Thermal and chemical stratification of urban ponds: Are they 'completely mixed reactors'? *Urban Ecosystems* 16: 327-339.
- Wagner, N.D., H. Hillebrand, A. Wacker, and **P.C. Frost**. 2013. Nutritional indicators and their uses in ecology. *Ecology Letters* 16: 535-544.
- Porter-Goff, E.R., **P.C. Frost** and M.A. Xenopoulos. 2013. Changes in riverine benthic diatom community structure along a chloride gradient. *Ecological Indicators* 32: 97-106.
- Frost, P.C.** and A.L. Hicks. 2012. Human shoreline development and the nutrient stoichiometry of aquatic plant communities in Canadian Shield lakes. *Canadian Journal of Fisheries and Aquatic Science* 69: 1642-1650.

- Wagner, N.D. and **P.C. Frost**. 2012. Responses of alkaline phosphatase activity in *Daphnia* to poor nutrition. *Oecologia* 170: 1-10.
- Lessard, C.R. and **P.C. Frost**. 2012. Phosphorus nutrition alters herbicide toxicity on *Daphnia magna*. *Science of the Total Environment* 421-422: 124-128.
- Zalewski, O., N.D. Wagner and **P.C. Frost**. 2011. Antibiotics affect the growth responses of *Daphnia magna* to poor food quality. *Aquatic Ecology* 45: 493-504.
- McFeeters, B.J. and **P.C. Frost**. 2011. Temperature and the effects of elemental food quality on *Daphnia*. *Freshwater Biology* 59: 1447-1455.
- McFeeters, B.J., M.A. Xenopoulos, D.E. Spooner, N.D. Wagner and **P.C. Frost**. 2011. Interspecific mass-scaling of field metabolic rates of a freshwater crayfish varies with stream land cover. *Ecosphere* 2:art13 [doi:10.1890/ES10-00112.1]
- Hicks, A.L. and **P.C. Frost**. 2011. Shifts in aquatic macrophyte abundance and community composition in cottage developed lakes of the Canadian Shield. *Aquatic Botany* 94: 9-16.
- Frost, P.C.**, D. Ebert, J.H. Larson, M.A. Marcus, N.D. Wagner, and A. Zalewski. 2010. Transgenerational effects of poor elemental food quality on an aquatic invertebrate. *Oecologia* 162: 865-872.
- McCarthy, S.D.S., S.P. Rafferty, and **P.C. Frost**. 2010. Responses of alkaline phosphatase activity to phosphorus-stress in *Daphnia magna*. *Journal of Experimental Biology* 213: 256-261.
- Frost, P.C.**, L.E. Kinsman, C.A. Johnston, and J.H. Larson. 2009. Watershed discharge modulates relationships between landscape components and nutrient ratios in stream seston. *Ecology* 90: 1631-1640.
- Frost, P.C.**, D. Ebert, and V.H. Smith. 2008. Bacterial infection changes the elemental composition of *Daphnia magna*. *Journal of Animal Ecology* 77: 1265-1272.
- Frost, P.C.** and J.J. Elser. 2008. Biological Stoichiometry. In: *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons. DOI: 10.1002/9780470015902.a0021229
- Frost, P.C.**, D. Ebert, and V.H. Smith. 2008. Responses of a bacterial pathogen to phosphorus limitation of its host. *Ecology* 89: 313-318.
- Hansen, L.K., **P.C. Frost**, J.H. Larson, and C.D. Metcalfe. 2008. Poor elemental food quality reduces the toxicity of fluoxetine on an aquatic invertebrate. *Aquatic Toxicology* 86: 99-103.
- Hillebrand, H., **P.C. Frost**, and A. Liess. 2008. Ecological stoichiometry of indirect grazer effects on periphyton nutrient content. *Oecologia* 155: 619-630.
- Johnston, C.A., B.A. Shmagin, **P.C. Frost**, C. Cherrier, J.H. Larson, G.A. Lamberti, and S.D. Bridgman. 2008. Wetland types and wetland maps differ in ability to predict dissolved organic carbon concentrations in streams. *Science for the Total Environment* 404: 326-334.
- Larson, J.H., **P.C. Frost**, and G.A. Lamberti. 2008. Variable toxicity of ionic liquids to *Lemma minor* and the influence of dissolved organic matter. *Environmental Toxicology and Chemistry* 27: 676-681.
- Rothlisberger, J.D., M.A. Baker, and **P.C. Frost**. 2008. Effects of periphyton stoichiometry on mayfly excretion rates and nutrient ratios. *Journal of the North American Benthological*

Society 27: 497-508.

- Frost, P.C.**, J.H. Larson, C.T. Cherrier, S. Bridgham, and G.A. Lamberti. 2007. Subsidy effect of dissolved organic matter on accrual, stoichiometry, and algal taxonomy of stream periphyton. *Freshwater Biology* 52: 319-330.
- James, L.A.H., M.A. Xenopoulos, H.F. Wilson, and **P.C. Frost**. 2007. Landscape controls of nutrient excretion by stream invertebrates along a gradient of agricultural land use. *Journal of the North American Benthological Society* 26: 523-531.
- Larson, J.H., **P.C. Frost**, D.M. Lodge, and G.A. Lamberti. 2007. Photodegradation of dissolved organic matter from forested streams of the northern Great Lakes region. *Journal of the North American Benthological Society* 26: 416-425.
- Larson, J.H., **P.C. Frost**, Z. Zheng, C.A. Johnston, S.D. Bridgham, D.M. Lodge, and G.A. Lamberti. 2007. Effects of upstream lakes on dissolved organic matter in streams. *Limnology and Oceanography* 52: 60-69.
- Frost, P.C.**, J.P. Benstead, W.F. Cross, H. Hillebrand, J.H. Larson, M.A. Xenopoulos, and T. Yoshida. 2006. Threshold elemental ratios of carbon and phosphorus in aquatic consumers. *Ecology Letters* 9: 774-779.
- Frost, P.C.**, A. Mack, J.H. Larson, S. Bridgham, and G.A. Lamberti. 2006. Environmental controls of UV radiation in forested streams of northern Michigan. *Photochemistry and Photobiology* 82: 781-786.
- Frost, P.C.**, J.H. Larson, C.A. Johnston, K.C. Young, P.A. Maurice, G.A. Lamberti, and S.D. Bridgham. 2006. Landscape predictors of stream dissolved organic matter concentration and physiochemistry in a Lake Superior river watershed. *Aquatic Sciences* 68: 40-51.
- Cross, W.F., J.P. Benstead, **P.C. Frost** and S.A. Thomas. 2005. Ecological stoichiometry in freshwater benthic systems: recent progress and perspectives. *Freshwater Biology* 50: 1895-1903.
- Frost, P.C.**, W.F. Cross, and J.P. Benstead. 2005. Ecological stoichiometry in freshwater benthic ecosystems: an introduction. *Freshwater Biology* 50: 1781-1785.
- Frost, P.C.**, H. Hillebrand, and M. Kahlert. 2005. Low algal carbon content and its effect on the C:P stoichiometry of periphyton. *Freshwater Biology* 50: 1800-1808.
- Frost, P.C.** and N.C. Tuchman. 2005. Nutrient release rates and ratios by two stream detritivores fed leaf litter grown under elevated atmospheric CO₂. *Archiv für Hydrobiologie* 163: 463-477.
- Frost, P.C.**, M.A. Evans-White, Z.V. Finkel, T.C. Jensen, and V. Matzek. 2005. Are you what you eat? Physiological constraints on organismal stoichiometry in an elementally imbalanced world. *Oikos* 109: 18-28.
- Frost, P.C.**, J.H. Larson, L.E. Kinsman, G.A. Lamberti, and S.D. Bridgham. 2005. Attenuation of ultraviolet radiation in streams of northern Michigan. *Journal of the North American Benthological Society* 24: 246-255.
- Frost, P.C.**, M.A. Xenopoulos, and J.H. Larson. 2004. Stoichiometry of dissolved organic carbon, nitrogen, and phosphorus release by a planktonic grazer, *Daphnia*. *Limnology and*

Oceanography 49: 1802-1808.

- Frost, P.C.**, S.E. Tank, M.A. Turner, and J.J. Elser. 2003. Elemental composition of littoral invertebrates from oligotrophic and eutrophic Canadian lakes. *Journal of the North American Benthological Society* 22: 51-62.
- Frost, P.C.**, P.A. Maurice, and J.B. Fein. 2003. The effect of cadmium on fulvic acid adsorption by *Bacillus subtilis*. *Chemical Geology* 200: 217-224.
- Xenopoulos, M.A. and **P.C. Frost**. 2003. Ultraviolet radiation changes the taxonomic composition of phytoplankton in a boreal lake. *Journal of Phycology* 39: 291-302.
- Frost, P.C.** and J.J. Elser. 2002. Effects of light and nutrients on the accumulation and elemental composition of epilithon in boreal lakes. *Freshwater Biology* 47: 173-184.
- Frost, P.C.** and J.J. Elser. 2002. Growth responses of littoral mayflies to the phosphorus content of their food. *Ecology Letters* 5: 232-240.
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Other Publications

- Frost, P.C.**, M.A. Xenopoulos, M. Epp and M. Hickson. "Scientific certainty survival kit: How to push back against skeptics who exploit uncertainty for political gain" *The Conversation*. January 3, 2022. (<https://theconversation.com/scientific-certainty-survival-kit-how-to-push-back-against-skeptics-who-exploit-uncertainty-for-political-gain-173578>)
- Frost, P.C.** "Loggerhead Marsh: A Wetland Oasis in Peterborough's West End" *Neighbours of the Old West End*. May 2017.
- Xenopoulos, M.A. and **Frost, P.C.** 2015. The dawn of a new era for the Experimental Lakes Area. *Limnology and Oceanography Bulletin*. DOI: 10.1002/lob.10053.
- Frost, P.C.** "Clean water is the prize that will be lost" Op-ed column. *Peterborough Examiner*. Peterborough, Ontario. May 25, 2012.
- Frost, P.C.**, E. Porter-Goff, and C. Middleton. 2012. *The Algae of the Kawartha Lakes*.

Kawartha Lake Stewards Association Booklet. Lakefield, Ontario.

Professional Activities

Editor-in-Chief. Ratios Matter. 2016-present. (ratiosmatter.org)

Co-Organizer. Biological Stoichiometry Seminar Series. 2021.

Special Features Editor. Aquatic Sciences. 2018-2021.

Associate Editor. Limnology and Oceanography. 2016-2020.

Associate Editor. Aquatic Sciences. 2015-2017.

Science Advisor. Kawartha Lake Stewards Association. 2009-2016.

Co-Guest Editor. Science of the Total Environment. Special Issue. Citizen Science and Aquatic Science. Published in 2017.

Special Session Co-organizer. SIL 2016. Turin, Italy. Community limnology: citizens and communities supporting freshwater research.

Special Session Co-organizer. Association for the Sciences of Limnology and Oceanography. 2015. Granada, Spain. People power: The role of citizen scientists in aquatic science- global opportunities and perspectives.

Special Session Organizer. International Association of Theoretical and Applied Limnology. 2007. Montreal, Quebec. Disease ecology in aquatic ecosystems.

Guest Editor. Freshwater Biology. Special Issue. Stoichiometry of benthic ecosystems. Published in November 2005.

Special Session Organizer. North American Benthological Society. 2004. Vancouver, British Columbia. Photoecology of benthic habitats: Interactions among ultraviolet radiation, organisms, and the environment.

Professional Workshops and Symposia

Conference on Biological Stoichiometry 2015. *Founder and chair of organizing committee.* Trent University, June 23-26, 2015.

Conference on Biological Stoichiometry 2023. *Organizing committee.* University of Nebraska.

Freshwater Imperative Revisited. 2023. *Attendee.* Workshop on the future of the Freshwater Imperative. Colorado State University, Colorado.

Advanced Course. 2010. *Invited lecturer.* Leaf litter decomposition in streams. IMAR & University of Coimbra, Portugal.

Gordon Research Conference. 2008. *Invited discussion leader.* The metabolic basis of ecology. University of New England, Maine.

Gordon Research Conference. 2004, 2006, 2012. *Attendee.* The metabolic basis of ecology. Bates College, Maine.

Gordon Research Conference. 2022. *Attendee.* Unifying ecology across scales. Southern New Hampshire University, New Hampshire.

Woodstoich 2004. *Organizing committee.* Symposium for the advancement of ecological stoichiometry. Finse, Norway.

Dissertation Initiative for the Advancement of Limnology and Oceanography V Symposium. 2003. *Attendee.* Bermuda Biological Station for Research, Bermuda.