

Natalie A. Griffiths

Science Lead and Research Staff Member

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Education and Training

2011 University of Notre Dame (UND), Biological Sciences, PhD. Dissertation title: Quantifying the impact of row-crop agriculture on carbon dynamics in Midwestern streams. Advisor: Dr. J.L. Tank.

2005 University of Toronto (U of T), Zoology and Physiology, Honors B.Sc. with High Distinction.

Research and Professional Experience

2016-pres. Science Lead for Aquatic Ecosystem Dynamics, Aquatic Ecology Group, Environmental Sciences Division (ESD), Oak Ridge National Laboratory (ORNL).

2013-pres. Research Staff Scientist, Climate Change Science Institute and ESD, ORNL. Projects: (1) Spruce and peatland responses under changing environments (SPRUCE), (2) Environmental sustainability of short-rotation pine for bioenergy, (3) Evaluating the long-term aquatic ecological responses to riparian ecosystem restoration at the Fort Benning, GA military installation.

2010-2013 Postdoctoral Research Associate, ESD, ORNL. Advisors: Drs. P.J. Mulholland and P.J. Hanson.

2004-2009 Teaching Assistant and Co-instructor, UND and U of T.

2003-2008 Research Assistant, UND and U of T.

2002-2005 Undergraduate Theses, Dept. of Zoology and Dept. of Botany, U of T.

Publications

1. Norman, B.C., M.R. Whiles, S.M. Collins, A.S. Flecker, S.K. Hamilton, S.L. Johnson, E.J. Rosi, L.R. Ashkenas, W.B. Bowden, C.L. Crenshaw, T. Cowl, W.K. Dodds, R.O. Hall Jr., R. El-Sabaawi, **N.A. Griffiths**, E. Martí, W.H. McDowell, S.D. Peterson, H.M. Rantala, T. Riis, K.S. Simon, J.L. Tank, S.A. Thomas, D. von Schiller, and J.R. Webster. 2017. Drivers of nitrogen transfer in stream food webs across continents. *In Press at Ecology*.
2. Tank, J.L., E. Martí, T. Riis, D. von Schiller, A.J. Reisinger, W.K. Dodds, M.R. Whiles, L.R. Ashkenas, W.B. Bowden, S.M. Collins, C.L. Crenshaw, T.A. Cowl, **N.A. Griffiths**, N.B. Grimm, S.K. Hamilton, S.L. Johnson, W.H. McDowell, B.M. Norman, E.J. Rosi-Marshall, K.S. Simon, S.A. Thomas, and J.R. Webster. 2017. Partitioning assimilatory nitrogen uptake in streams: an analysis of stable isotope tracer additions across continents. *In Press at Ecological Monographs*.
3. **Griffiths, N.A.**, P.J. Hanson, D.M. Ricciuto, C.M. Iversen, A.M. Jensen, A. Malhotra, K.J. McFarlane, R.J. Norby, K. Sargsyan, S.D. Sebestyen, X. Shi, A.P. Walker, E.J. Ward, J.M. Warren, and D.J. Weston. 2017. Temporal and spatial variation in peatland carbon cycling and implications for interpreting responses of an ecosystem-scale warming experiment. *In Press at Soil Science Society of America Journal*.
4. Follstad Shah, J.J., J.S. Kominoski, M. Ardón, W.K. Dodds, M.O. Gessner, **N.A. Griffiths**, C.P. Hawkins, A. Lecerf, C.J. LeRoy, D.W.P. Manning, S.L. Johnson, A.D. Rosemond, R.L. Sinsabaugh, C.M. Swan, J.R. Webster, and L.H. Zeglin. 2017. Global synthesis of the temperature sensitivity of leaf litter breakdown in streams and rivers. *Global Change Biology* 23:3064-3075.
5. **Griffiths, N.A.**, C.R. Jackson, M.M. Bitew, A.M. Fortner, K.L. Fouts, K. McCracken, and J.R. Phillips. 2017. Water quality effects of short-rotation pine management for bioenergy feedstocks in the southeastern United States. *Forest Ecology and Management* 400:181-198.
6. **Griffiths, N.A.**, J.L. Tank, T.V. Royer, E.J. Rosi, A.J. Shogren, T.C. Frauendorf, and M.R. Whiles. 2017. Occurrence, leaching, and degradation of Cry1Ab protein from transgenic maize detritus in agricultural streams. *Science of the Total Environment* 592:97-105.
7. Brooks, S.C., C.C. Brandt, and **N.A. Griffiths**. 2017. Estimating uncertainty in ambient and saturation nutrient uptake metrics from nutrient pulse releases in stream ecosystems. *Limnology and Oceanography: Methods* 15:22-37.
8. Hill, W.R., and **N.A. Griffiths**. 2017. Nitrogen processing by grazers in a headwater stream: riparian connections. *Freshwater Biology* 62:17-29.
9. Wilson, R.M., A.M. Hoppie, M.M. Tfaily, S.D. Sebestyen, C.W. Schadt, L. Pfeifer-Meister, C. Medvedeff, K.J. McFarlane, J.E. Kostka, M. Kolton, R. Kolka, L.A. Kluber, J.K. Keller, T.P. Guilderson, **N.A. Griffiths**, J.P. Chanton, S.D. Bridgman, and P.J. Hanson. 2016. Stability of peatland carbon to rising temperatures. *Nature Communications* 7:13723.

10. **Griffiths, N.A.**, and S.D. Sebestyen. 2016. Dynamic vertical profiles of peat porewater chemistry in a northern peatland. *Wetlands* 36:1119-1130.
11. Jackson, C.R., E. Du., J. Klaus, **N.A. Griffiths**, M. Bitew, and J.J. McDonnell. 2016. Interactions among hydraulic conductivity distributions, subsurface topography, and transport thresholds revealed by a multi-tracer hillslope irrigation experiment. *Water Resources Research* 52:6186-6206.
12. **Griffiths, N.A.**, and S.D. Tiegs. 2016. Organic matter decomposition along a temperature gradient in a forested headwater stream. *Freshwater Science* 32:518-533.
13. Du, E., C.R. Jackson, J. Klaus, J.J. McDonnell, **N.A. Griffiths**, M.F. Williamson, J.L. Greco, and M. Bitew. 2016. Interflow dynamics on a low relief forested hillslope: lots of fill, little spill. *Journal of Hydrology* 534:648-658.
14. **Griffiths, N.A.**, C.R. Jackson, J.J. McDonnell, J. Klaus, E. Du, and M.M. Bitew. 2016. Dual nitrate isotopes clarify the role of biological processing and hydrologic flow paths on nitrogen cycling in subtropical low-gradient watersheds. *JGR-Biogeosciences* 131:422-437.
15. Shi, X., P.E. Thornton, D.M. Ricciuto, P.J. Hanson, J. Mao, S.D. Sebestyen, **N.A. Griffiths**, and G. Bisht. 2015. Representing northern peatland microtopography and hydrology within the Community Land Model. *Biogeosciences* 12:6463-6477.
16. Klaus, J., J.J. McDonnell, C.R. Jackson, E. Du, and **N.A. Griffiths**. 2015. Where does streamwater come from in low-relief forested watersheds? A dual isotope approach. *Hydrology and Earth System Sciences* 19:125-135.
17. Roley, S.S., J.L. Tank, **N.A. Griffiths**, R.O. Hall Jr., and R.T. Davis. 2014. The influence of floodplain restoration on whole-stream metabolism in an agricultural stream: insights from a 5-year continuous data set. *Freshwater Science* 33:1043-1059.
18. Dodds, W.K., S.M. Collins, S.K. Hamilton, J.L. Tank, S. Johnson, J.R. Webster, K.S. Simon, M.R. Whiles, H.M. Rantala, W.H. McDowell, S.D. Peterson, T. Riis, C.L. Crenshaw, S.A. Thomas, P.B. Kristensen, B.M. Cheever, A.S. Flecker, **N.A. Griffiths**, T. Crowl, E.J. Rosi-Marshall, R. El-Sabaawi, and E. Martí. 2014. You are not always what we think you eat: selective assimilation across multiple whole-stream isotopic tracer studies. *Ecology* 95:2757-2767.
19. **Griffiths, N.A.**, and W.R. Hill. 2014. Temporal variation in the importance of a dominant consumer to stream nutrient cycling. *Ecosystems* 17:1169-1185.
20. Kominoski, J.S., J.J. Follstad Shah, C. Canhoto, D.G. Fischer, D.P. Gilling, E. González, **N.A. Griffiths**, A. Larrañaga, C.J. LeRoy, M.M. Mineau, Y.R. McElarney, S.M. Shirley, C.M. Swan, and S.D. Tiegs. 2013. Forecasting functional implications of global changes in riparian plant communities. *Frontiers in Ecology and the Environment* 11:423-432.
21. **Griffiths, N.A.**, J.L. Tank, T.V. Royer, S.S. Roley, E.J. Rosi-Marshall, M.R. Whiles, J.J. Beaulieu, and L.T. Johnson. 2013. Agricultural land use alters the seasonality and magnitude of stream metabolism. *Limnology and Oceanography* 58:1513-1529.
22. Tiegs, S.D., J.E. Clapcott, **N.A. Griffiths**, and A.J. Boulton. 2013. A standardized cotton-strip assay for measuring organic-matter decomposition in streams. *Ecological Indicators* 32:131-139.
23. **Griffiths, N.A.**, J.L. Tank, S.S. Roley, and M.L. Stephen. 2012. Decomposition of maize leaves and grasses in restored agricultural streams. *Freshwater Science* 31:848-864.
24. **Griffiths, N.A.**, J.L. Tank, T.V. Royer, T.J. Warrner, T.C. Frauendorf, E.J. Rosi-Marshall, and M.R. Whiles. 2012. Temporal variation in organic carbon spiraling in Midwestern agricultural streams. *Biogeochemistry* 108:149-169.
25. Parish, E.S., M.R. Hilliard, L.M. Baskaran, V.H. Dale, **N.A. Griffiths**, P.J. Mulholland, A. Sorokine, M.E. Downing, R.S. Middleton, and N.A. Thomas. 2012. Multimetric spatial optimization of switchgrass plantings across a watershed. *Biofuels, Bioproducts and Biorefining* 6:58-72.
26. Tank, J.L., E.J. Rosi-Marshall, T.V. Royer, M.R. Whiles, **N.A. Griffiths**, T.C. Frauendorf, and D.J. Treering. 2010. Occurrence of maize detritus and a transgenic insecticidal protein (Cry1Ab) within the stream network of an agricultural landscape. *Proceedings of the National Academy of Sciences of the United States of America* 107:17645-17650.
27. Chambers, C.P., M.R. Whiles, E.J. Rosi-Marshall, J.L. Tank, T.V. Royer, **N.A. Griffiths**, M.A. Evans-White, and A.J. Stojak. 2010. Responses of stream macroinvertebrates to Bt maize leaf detritus. *Ecological Applications* 20:1949-1960.
28. Tank, J.L., E.J. Rosi-Marshall, **N.A. Griffiths**, S.A. Entekin, and M.L. Stephen. 2010. A review of allochthonous organic matter dynamics and metabolism in streams. *Journal of the North American Benthological Society* 29:118-146.

29. Warrner, T.J., T.V. Royer, J.L. Tank, **N.A. Griffiths**, E.J. Rosi-Marshall, and M.R. Whiles. 2009. Origin and bioavailability of dissolved organic carbon in agricultural headwater streams in Indiana, USA. *Biogeochemistry* 95:295-307.
30. **Griffiths, N.A.**, J.L. Tank, T.V. Royer, E.J. Rosi-Marshall, M.R. Whiles, C.P. Chambers, T.C. Frauendorf, and M.A. Evans-White. 2009. Rapid decomposition of maize detritus in agricultural headwater streams. *Ecological Applications* 19:133-142.
31. Rosi-Marshall, E.J., J.L. Tank, T.V. Royer, M.R. Whiles, M. Evans-White, C. Chambers, **N.A. Griffiths**, J. Pokelsek, and M.L. Stephen. 2007. Toxins in transgenic crop byproducts may affect headwater stream ecosystems. *Proceedings of the National Academy of Sciences of the United States of America* 104:16204-16208.
32. **Griffiths, N.A.** and H. Cyr. 2006. Are there hot spots for *Elliptio complanata* in the shallow littoral zone of a large Canadian Shield lake? *Canadian Journal of Fisheries and Aquatic Sciences* 63:2137-2147.

Book Chapters

1. Lamberti, G.A., S.A. Entekin, **N.A. Griffiths**, and S.D. Tiegs, S.D. 2017. Coarse Particulate Organic Matter: Storage, Transport, and Retention. In: Lamberti, G.A., and F.R. Hauer. (Eds.), *Methods in Stream Ecology: Volume 2: Ecosystem Function*. Elsevier, Academic Press, pp. 55–69.
2. McManamay, R.A., **N.A. Griffiths**, C.R. DeRolph, and B.M. Pracheil. Accepted. A Synopsis of Global Mapping of Freshwater Habitats and Biodiversity: Implications for Conservation. In: *Pure and Applied Biogeography*.

Awards and Recognition

1. 2011 - Eli J. and Helen Shaheen Graduate School Award to the Top Ph.D. in Science, UND.
2. 2010 - Sigma Xi Grant-in-Aid of Research.
3. 2009 - Certification of Teaching Excellence from the Kaneb Center for Teaching and Learning, UND.
4. 2009 - Kaneb Center's Outstanding Graduate Student Teacher Award for Excellence in Teaching, UND.
5. 2008-2009 - Bayer Predoctoral Research Fellowship, UND.
6. 2008-2009 - NSF Doctoral Dissertation Improvement Grant.
7. 2007-2010 - NSERC Post-Graduate Scholarship: Doctoral.
8. 2007 - North American Benthological Society Presidential Award.
9. 2005-2006 - NSERC Post-Graduate Scholarship: Masters.

Synergistic Activities

1. Reviewer for *Applied Geochemistry*; *Aquatic Sciences*; *Austral Ecology*; *Biogeochemistry*; *Biological Reviews*; *Ecological Modelling*; *Ecological Monographs*; *Ecology Letters*; *Ecosystems*; *Forest Ecology and Management*; *Freshwater Biology*; *Freshwater Science*; *Frontiers in Ecology and the Environment*; *Geophysical Research Letters*; *Hydrobiologia*; *International Review of Hydrobiology*; *JGR-Biogeosciences*; *Journal of the American Water Resources Association*; *Journal of Environmental Quality*; *Journal of Forest Research*; *Journal of Freshwater Ecology*; *Journal of Hydrology*; *Journal of the North American Benthological Society*; *Limnology and Oceanography*; *Marine and Freshwater Research*; *New Phytologist*; *Science of the Total Environment*; *Water*; *Water, Air, and Soil Pollution* (2008-present).
2. Reviewer for Department of Energy's Office of Biological and Environmental Research, Environmental System Sciences proposals, National Science Foundation Division of Environmental Biology proposal.
3. Memberships in: American Geophysical Union, Ecological Society of America, Society for Freshwater Science (formerly the North American Benthological Society; NABS).
4. Society for Freshwater Science (SFS) Board of Directors representative (Early Career/Young Professional elected position; 2015-present), SFS Early Career committee chair (2016-present), NABS (now SFS) Executive Committee graduate student representative (2010-2011), NABS Graduate Resources Committee (GRC) Chair (2009-2010), J-NABS Strategic Planning Committee graduate representative (2008-2009), GRC student workshop organizer (2008-2009), GRC live auction committee (2007-2008).
5. Member of the Program Committee for the Interagency Conference on Research in Watersheds (ICRW) in Charleston, SC in March 2015 (2014-2015).