

Natalie Adriana Griffiths

Postdoctoral Research Associate
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Education:

- 2011 Ph.D. in Biological Sciences.
University of Notre Dame (UND), Notre Dame, Indiana.
Dissertation title: Quantifying the impact of row-crop agriculture on carbon dynamics in Midwestern streams. Advisor: Dr. J.L. Tank.
- 2005 Honors B.Sc. with High Distinction in Zoology and Physiology.
University of Toronto (U of T), Toronto, Canada.

Current Appointments:

- 2011-present Adjunct Research Assistant Professor, Dept. of Ecology and Evolutionary Biology,
University of Tennessee.
- 2010-present Postdoctoral Research Associate, Environmental Sciences Division, Oak Ridge
National Laboratory (ORNL). Advisor: Dr. P.J. Mulholland.

Academic Honors and Awards:

- 2009 Kaneb Center's Outstanding Graduate Student Teacher Award for Excellence in Teaching, UND.
- 2005 Drew Thompson Scholarship, Trinity College, U of T.
- 2004 Kenneth C. Fisher Memorial Scholarship in Zoology, U of T.
- 2002 Provost's Scholarship, Trinity College, U of T.
- 2001-2005 Dean's List, U of T.

Research

Research Focus:

Aquatic ecology and biogeochemistry, and the impacts of anthropogenic activities on aquatic ecosystems

Research Experience:

- 2010- Postdoctoral Research Associate, Environmental Sciences Division, Oak Ridge National Laboratory (ORNL). Advisor: Dr. P.J. Mulholland.
Projects: (1) Spruce and peatland responses under climatic and environmental change (with a focus on water quality and hydrology), (2) Assessing the hydrologic and water quality impacts of short rotation pine as a bioenergy feedstock in the southeastern U.S., (3) Long-term monitoring of Walker Branch Watershed.
- 2005-2008 Research Assistant, Dept. of Biological Sciences, UND.
Project: Cycling of novel allochthonous carbon in agricultural streams.
Principal Investigators: Drs. J.L. Tank, E.J. Rosi-Marshall, T.V. Royer, and M.R. Whiles.
- 2004-2005 Undergraduate Thesis, Dept. of Zoology, U of T.
Title: Are there hot spots for *Elliptio complanata* in the shallow littoral zone of a large Canadian Shield lake? Advisor: Dr. H. Cyr.
- 2004-2005 Undergraduate Thesis, Dept. of Botany, U of T.
Title: Anatomical and functional organization of the stem and root xylem of *Sarcandra glabra*. Advisor: Dr. T.S. Feild.
- 2003-2005 Research Assistant, Dept. of Zoology, U of T.
Supervisors: Drs. L. Rowe and F.H. Rodd.
- 2003 Research Assistant, Dept. of Biological Sciences, UND.
Project: Lotic Intersite Nitrogen eXperiment II (LINXII). Supervisor: Dr. J.L. Tank.
- 2002-2003 Undergraduate Thesis, Dept. of Botany, U of T.
Title: Parental effects due to host plant quality in swamp milkweed beetles.
Advisors: Drs. A.A. Agrawal and P.A. Van Zandt.

Research Grants and Fellowships:

- 2010 Sigma Xi Grant-in-Aid of Research. Title: Decomposition of corn leaves and native and invasive grasses in the floodplains of restored agricultural streams (\$965).
- 2008-2009 Bayer Predoctoral Research Fellowship, UND (\$8,000).
- 2008-2009 National Science Foundation (NSF) Doctoral Dissertation Improvement Grant (DDIG) (with J.L. Tank). Title: Transport, sorption, and degradation of Cry1Ab

toxins derived from genetically engineered corn crop byproducts in agricultural streams (\$11,499).

- 2008-2009 McDonald Undergraduate Research Grant (with undergraduate J. Kang), UND (\$500).
- 2007-2010 Natural Sciences and Engineering Research Council of Canada (NSERC) Post-Graduate Scholarship: Doctoral (PGS-D). Title: The role of agricultural land use on carbon cycling in Midwestern headwater streams (\$63,000).
- 2007 North American Benthological Society Presidential Award (\$600).
- 2005-2006 NSERC Post-Graduate Scholarship: Masters (PGS-M). Title: The role of agricultural land use on carbon cycling in Midwestern headwater streams (\$17,300).
- 2004 NSERC PGS-M (\$17,300; awarded but declined).
- 2004 NSERC Undergraduate Student Research Award. Title: Phosphorus loading of sediments in a large Canadian Shield lake (\$6,000).
- 2002 Northrop Frye BIO150Y Scholarship, U of T. Title: The impact of induced plant responses of the common milkweed (*Asclepius syriaca*) on its herbivore community (\$4,000).

Publications:

Griffiths, N.A., J.L. Tank, T.V. Royer, T.J. Warner, T.C. Frauendorf, E.J. Rosi-Marshall, and M.R. Whiles. 2011. Temporal variation in organic carbon spiraling in Midwestern agricultural streams. *Biogeochemistry* In Press.

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.

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.

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.

Warner, 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.

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.

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.

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.

Manuscripts in Review:

Pokelsek, J.D., E.J. Rosi-Marshall, J.L. Tank, M.R. Whiles, T.V. Royer, M.A. Evans-White, **N.A. Griffiths**, and C.P. Chambers. Effects of Transgenic maize pollen on caddisflies in agricultural streams. *In Review* at Environmental Entomology.

Manuscripts in Preparation:

Griffiths, N.A., J.L. Tank, S.S. Roley, and M.L. Stephen. Decomposition of maize leaves and grasses in restored agricultural streams. *In Preparation* for the Journal of the North American Benthological Society.

Griffiths, N.A., J.L. Tank, T.V. Royer, T.C. Frauendorf, E.J. Rosi-Marshall, and M.R. Whiles. Occurrence, degradation, and sorption of Cry1Ab protein from genetically modified maize detritus in agricultural streams. *In Preparation* for Molecular Ecology.

Griffiths, N.A., J.L. Tank, E.J. Rosi-Marshall, T.V. Royer, M.R. Whiles, J.J. Beaulieu, L.T. Johnson, S.S. Roley, and M.L. Stephen. Inter- and intra-system variation in whole-stream metabolism within an agricultural landscape. *In Preparation* for Ecosystems.

Published Abstracts (reflecting papers presented at national meetings):

Mulholland, P.J., S.D. Sebestyen, **N.A. Griffiths**, P.J. Hanson, J. Warren, and R.K. Kolka. Water research within the SPRUCE experiment, a large-scale study of climate change effects on a northern peatland. American Geophysical Union (AGU) fall meeting, December 2010. Poster presentation.

Griffiths, N.A., J.L. Tank, S.S. Roley, and M.L. Stephen. Comparison of detrital decomposition in floodplain and main channel habitats of restored agricultural streams. North American Benthological Society (NABS) and American Society of Limnology and Oceanography (ASLO) joint conference, Santa Fe, NM, June 2010. Oral presentation.

Griffiths, N.A., J.L. Tank, E.J. Rosi-Marshall, T.V. Royer, M.R. Whiles, R. Conley, T.C. Frauendorf, and J. Kang. Transport and degradation of Cry1Ab protein derived from

genetically-engineered maize crop byproducts in agricultural streams. NABS conference, Grand Rapids, MI, May 2009. Oral presentation.

Griffiths, N.A., J.L. Tank, J.J. Beaulieu, L.T. Johnson, S.S. Roley, and M.L. Stephen. Effect of storms on agricultural stream metabolism. ASLO conference, St. John's, NL, June 2008. Oral presentation.

Royer, T.V., T.J. Warrner, **N.A. Griffiths**, J.L. Tank, E.J. Rosi-Marshall, and M.R. Whiles. Biogeochemistry of dissolved organic carbon in headwater agricultural streams. ASLO conference, St. John's, NL, June 2008. Oral presentation.

Griffiths, N.A., J.L. Tank, E.J. Rosi-Marshall, T.V. Royer, M.R. Whiles, J.J. Beaulieu, L.T. Johnson, S.S. Roley, and M.L. Stephen. Inter- and intra-system variation in whole-stream metabolism within an agricultural landscape. NABS conference, Salt Lake City, UT, May 2008. Oral presentation.

Griffiths, N.A., J.L. Tank., T.J. Warrner, T.V. Royer, T.C. Frauendorf, C.P. Chambers, J.D. Pokelsek, M.A. Evans-White, E.J. Rosi-Marshall, and M.R. Whiles. The contribution of corn detritus to metabolism and carbon cycling in Midwestern agricultural streams. NABS conference, Columbia, SC, June 2007. Oral presentation.

Frauendorf, T.C., **N.A. Griffiths**, J.L. Tank, M.A. Evans-White, E.J. Rosi-Marshall, T.V. Royer, and M.R. Whiles. Bt leaching from corn detritus and the effects on stream sediment respiration. NABS conference, Columbia, SC, June 2007. Poster presentation.

Chambers, C.P., M.R. Whiles, **N.A. Griffiths**, M.A. Evans-White, E.J. Rosi-Marshall, J.L. Tank, and T. V. Royer. Assessing the impacts of transgenic Bt corn detritus on macroinvertebrate communities in agricultural streams. NABS conference, Columbia, SC, June 2007. Oral presentation.

Warrner, T.J., T.V. Royer, **N.A. Griffiths**, M.A. Evans-White, J.L. Tank, E.J. Rosi-Marshall, and M.R. Whiles. Biogeochemistry of dissolved organic carbon in Midwestern agricultural streams. NABS conference, Columbia, SC, June 2007. Poster presentation.

Pokelsek, J.D., E.J. Rosi-Marshall, C.P. Chambers, **N.A. Griffiths**, M.A. Evans-White, J.L. Tank, M.R. Whiles, and T.V. Royer. Effects of Bt corn pollen on caddisfly growth rates in Midwestern agricultural streams. NABS conference, Columbia, SC, June 2007. Oral presentation.

Rosi-Marshall, E.J., J.L. Tank, M. Evans-White, T.V. Royer, M.R. Whiles, J. Pokelsek, **N.A. Griffiths**, and C.P. Chambers. Crop residues and stream carbon budgets: examining the ecological significance of allochthonous carbon in Midwestern agricultural streams. ASLO conference, Santa Fe, NM, February 2007. Oral presentation.

Griffiths, N.A., C.P. Chambers, J.L. Tank, M.A. Evans-White, E.J. Rosi-Marshall, T.V. Royer, and M.R. Whiles. Microbial respiration and decomposition of corn detritus in Midwestern agricultural streams. NABS conference, Anchorage, AK, June 2006. Oral presentation.

Evans-White, M.A., J.L. Tank, M.R. Whiles, **N.A. Griffiths**, E.J. Rosi-Marshall, and T.V. Royer. The role of allochthonous carbon in the food webs of agricultural streams. NABS conference, Anchorage, AK, June 2006. Oral presentation.

Griffiths, N.A., L.C. Taylor, M.J. Bernot, and J.L. Tank. Effects of antibiotic addition on nutrient limitation in streams. NABS conference, Vancouver, BC, June 2004. Poster presentation.

Invited Seminars:

2011 Department of Biology, Oakland University, Rochester, Michigan.

2010 Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Special Courses/Workshops Attended:

2011 ¹⁵N Food Web Modeling workshop, Konza Prairie (Kansas State University). Lead PIs: Drs. W.K. Dodds and M.R. Whiles.

2010 Leaf Litter Decomposition in Streams course, University of Coimbra, Portugal.

2009 American Institute of Biological Sciences (AIBS) science outreach and policy training workshop.

2008 ESRI course: Introduction to Geographic Information System (GIS).

2008 Communications Partnership for Science and the Sea (COMPASS) communications training workshop.

2006 Selected participant for the Fundamentals of Ecosystem Ecology course, Cary Institute of Ecosystem Studies, Millbrook, NY.

Memberships in Professional Associations:

American Society of Limnology and Oceanography
Ecological Society of America
North American Benthological Society

Teaching and Mentoring

Teaching Experience:

- 2009 Co-instructor for Aquatic Insects with Dr. R.A. Hellenthal, UND.
- 2008 Teaching Assistant for Aquatic Ecology, UND.
- 2008 Co-instructor for Ecosystem Ecology with Dr. G.A. Lamberti to graduate students in the NSF IGERT program (taught at the University of Notre Dame Environmental Research Center).
- 2008 Teaching Assistant for Biostatistics, UND.
- 2006 Teaching Assistant for General Ecology, UND.
- 2004-2005 Teaching Assistant for Animal Physiology, U of T.

Teaching Awards and Certificates:

- 2009 Certification of Teaching Excellence from the Kaneb Center for Teaching and Learning and the Department of Biological Sciences, UND.
- 2009 Kaneb Center's Outstanding Graduate Student Teacher Award for Excellence in Teaching, UND.

Undergraduate Research Projects Mentored:

- 2008-2009 Jennifer Kang, Undergraduate Research Thesis, UND.
Thesis title: The leaching and degradation of Cry1Ab proteins from genetically-engineered corn in stream ecosystems.
Presented research at UND's College of Science Joint Annual Meeting, May 2009.
- 2006-2007 Therese Frauendorf, Undergraduate Research Thesis, UND.
Thesis title: Bt leaching from corn detritus and the effects on stream sediment respiration.
Presented research at the NABS conference, Columbia, SC, June 2007.

Teaching Courses/Workshops Attended:

- 2009 Designing and Teaching Your First Biology or Chemistry course, UND.
- 2008 Innovative Teaching and Active Learning: Principles, Practice, and Materials, Ecological Society of America annual meeting, Milwaukee, WI.

Professional Service

- Reviewer for the Journal of the North American Benthological Society, Limnology and Oceanography, Forest Ecology and Management, Journal of Environmental Quality, Journal of the American Water Resources Association, Hydrobiologia (2008-present).
- Contributing member to the Faculty of 1000 Marine and Freshwater Ecology section (2008-present).
- Member of the National Ecological Observatory Network (NEON) STRream Experimental Observation Network (STREON) working group (2011)
- NABS Executive Committee graduate student representative (2010-present), NABS Graduate Resources Committee (GRC) Chair (2009-2010), NABS Strategic Planning Committee graduate representative (2008-2009), GRC student workshop organizer (2008-2009), GRC live auction committee (2007-2008).
- UND Biology Graduate Student Organization (BGSO) volunteer activities coordinator (2009-2010), BGSO graduate recruitment weekend coordinator (2008-2009).
- Graduate representative on UND's College of Science Advisory Council (2008-2009), Graduate Co-chair for UND's Department of Biological Sciences faculty search (2010).
- Science judge for the Tennessee Science Bowl (2011), Judge for UND's Graduate Research Symposium (2008), numerous science fairs around northern Indiana (grades 1-8), including the northern Indiana Regional Science Fair (2006-2010).
- Undergraduate representative on the Biological Sciences Departmental Reorganization Group, U of T (2004-2005).
- Botany Undergraduate Departmental Society publicity coordinator, U of T (2004-2005).