

Lauren E. McPhillips

Biological & Environmental Engineering

Cornell University

Ithaca, NY 14853

Email: lem36@cornell.edu

Website: soilandwater.bee.cornell.edu/People/lauren_mcphillips.htm

ACADEMIC INTERESTS

Environmental Science □ Hydrology □ Biogeochemistry □ GIS & Spatial Data Analysis □ Environmental Modeling

EDUCATION

Ph.D. expected 2016, Biological and Environmental Engineering, Cornell University, Ithaca NY

Major Advisor: M. Todd Walter

M.S., 2013, Biological and Environmental Engineering, Cornell University, Ithaca NY

Major Advisor: M. Todd Walter

Title: Hydrologic and biogeochemical drivers of denitrification in a stream riparian area

B.S., 2007, *cum laude with distinction in research* - Science of Earth Systems, Cornell University, Ithaca NY

2006 Cornell University Field Program in Earth and Environmental Systems, Hawai'i

Thesis title: Snow distribution patterns at land cover boundaries in Tompkins County, NY

RESEARCH POSITIONS

Soil & Water Lab, Graduate Researcher, Cornell University, Ithaca, NY Aug 2010- present

Pursuing PhD research on hydrologic and biogeochemical dynamics of suburban stormwater infrastructure; pursued Master's degree research on controls of denitrification in riparian areas; also coordinated projects collecting baseline water quality data where natural gas drilling in the Marcellus shale is anticipated

US Geological Survey, Research Technician, Reston, VA Jul 2007- Jul 2010

Worked in the 'Hydroecology of Flowing Waters' project group; assisted Drs. Jud Harvey, Greg Noe, Ben O'Connor and Laurel Larsen with field data collection, laboratory analysis of water and soil samples and computer data analysis and modeling to answer questions on biogeochemical and hydraulic processes and sediment transport

NSF Research Experience for Undergraduates Program, Polson, MT Jun 2006- Aug 2006

Flathead Lake Biological Station, University of Montana; worked under direction of Dr. Mark Lorang on modeling wave climate on Flathead Lake using wind and wave gauges, and applications of model

Soil and Water Lab, Undergraduate Researcher, Cornell University, Ithaca, NY Sept 2005- May 2007

Assisted graduate students with various projects; worked on senior honors thesis with Dr. M. Todd Walter involving evaluation of soil moisture and snow accumulation patterns across Tompkins County, NY

Soil Microbiology Lab, Undergraduate Researcher, Cornell University, Ithaca, NY Feb 2004- May 2007

Conducted research with fungal populations in Amazonian *Terra Preta* soils with Dr. Janice Thies; visited *Terra Preta* sites and assisted in administering soil microbiology workshop in Manaus, Brazil during August 2005

Mohonk Preserve, Summer Research Intern, New Paltz, NY Jun 2004- Aug 2004

Assisted in daily weather data collection and natural history research; conducted independent project on visitor impact and erosion of Mohonk Preserve trails

TEACHING EXPERIENCE

BEE 4710: Introduction to Groundwater Spring 2013

Guest lecturer: Taught 1 class on issues related to methane migration in groundwater

BEE 4730: Watershed Engineering Fall 2011, 2012

Guest lab lecturer: Taught lab sessions on measurement of stream discharge and stormwater management

BEE 3710: Physical Hydrology for Ecosystems Spring 2011

Teaching assistant: Prepared for and assisted in development of labs, taught multiple lab sessions and gave 1 class lecture, graded all homeworks

SNES 1101: Intro. to Science and Management of Environmental and Natural Resources Fall 2010

Guest lab lecturer: Taught 1 lab session on measurement of stream discharge

CSS 2600: Soil Science Fall 2004

Undergraduate teaching assistant: Assisted in preparing for and administering labs

HONORS

- 2013 NSF IGERT Video & Poster Competition ‘Judge’s Choice’ Award
2013 New York Water Environment Association N.G. Kaul Memorial Scholarship
2010 Alpha Epsilon inductee- honor society for agricultural, biological, and environmental engineers
2009 USGS Star Research Associate Award- recognizes outstanding work in the past year
2007 Acceptance of Cornell senior honor thesis “Snow distribution patterns at land cover boundaries in Tompkins County, NY”
2003- 2007 Cornell University- College of Agriculture and Life Sciences Dean’s List, 6 semesters

GRANTS

- 2012 Cornell Cross-Scale Biogeochemistry and Climate IGERT Small Grant (\$4000) (co-PI with fellow PhD student Elliot Friedman)
2012 Cornell Sustainable Biodiversity Small Grant (\$5300) (co-PI with fellow PhD student Elliot Friedman)
2012 Cornell Graduate School Conference Travel Grant (\$440)
2012 Cornell/ NSF IGERT Traineeship in ‘Cross-Scale Biogeochemistry and Climate’ (2 years stipend & tuition)
2011 Cornell Graduate School Conference Travel Grant (\$440)
2011 NSF Graduate Research Fellowship (3 years stipend & tuition)
2011 Cornell University Program in Biogeochemistry and Environmental Biocomplexity Small Grant (\$4000)
2003-2007 Hunter R. Rawlings III Cornell Presidential Research Scholarship (\$16,000)
2003-2007 Toyota Motor Corporation Community Scholarship (\$10,000)

PEER-REVIEWED PUBLICATIONS

- McPhillips, L.E.**, M.T. Walter, and P.M. Groffman. In Prep. Assessing hydrologic and biogeochemical drivers of denitrification in a stream riparian area. In preparation for submission to *Journal of Geophysical Research- Biogeosciences*.
- McPhillips, L.E.**, A.E. Creamer, B.G. Rahm, and M.T. Walter. In Review. Spatial analysis of dissolved methane in central New York groundwater. *Water Resources Research*.
- Harvey, J.W., J.D. Drummond, R.L. Martin, **L.E. McPhillips**, A.I. Packman, D.J. Jerolmack, S.H. Stonedahl, A. Aubeneau, A.H. Sawyer, L.G. Larsen, and C.R. Tobias. 2012. Stream solute and fine sediment transport interactions with dynamic hyporheic flow and mobile bedforms. *Journal of Geophysical Research- Biogeosciences*, 117, G00N11, doi:10.1029/2012JG002043.
- O'Connor, B. L., J. W. Harvey, and **L. E. McPhillips**. 2012. Thresholds of storm-induced bed disturbances and their effects on stream metabolism in an agricultural river. *Water Resources Research*. 48,W08504, doi: 2011WR011488RR .
- Harvey, J.W., G.B. Noe, L.G. Larsen, D.J. Nowacki and **L.E. McPhillips**. 2010. Field flume reveals aquatic vegetation’s role in sediment and particulate phosphorus transport in a shallow aquatic ecosystem. *Geomorphology*. 126: 297-313, doi:10.1016/j.geomorph.2010.03.028.

TECHNICAL REPORTS

- M.T. Walter, B.P. Buchanan, **L.E. McPhillips**, E.A. Kreitinger, and M.B. Fitzgerald, 2012. Emerald Ash Borer Water Quality Project: Baseline Report. *Report to New York Water Resources Institute*. Ithaca, NY.

CONFERENCE PRESENTATIONS (presenter underlined; poster unless noted otherwise)

- McPhillips, L.E.**, A.E. Creamer, B.G. Rahm, and M.T. Walter. 2013. Baseline evaluation of groundwater quality in central New York prior to shale gas development. Valley Central High School Science Research Symposium. Montgomery, NY. [invited oral presentation by L.E. McPhillips]
- McPhillips, L.E.**, J.R. Barclay, and C.A. Roco, 2013. Creating a bridge from microbiology to modeling: Improving our capabilities to understand nitrous oxide dynamics on multiple scales and create better climate models for the future.

National Science Foundation IGERT (Integrative Graduate Education and Research Traineeship) Online Poster and Video Competition. *[poster and video presentation]*

McPhillips, L.E., A.E. Creamer, M.T. Walter, and B.G. Rahm. 2013. Baseline evaluation of groundwater quality in central New York prior to shale gas development. Institute of Biological Engineering Annual Meeting, Raleigh, NC. *[1st place undergraduate poster awarded to A.E. Creamer]*

Friedman, E.S., L.E. McPhillips, K. Miller, D.A. Lipson, M.T. Walter, L.T. Angenent. 2013. Use of Microbial Electrochemical Systems to Study Microbial Community Dynamics in Environmental Ecosystems. Association of Environmental Engineering & Science Professors (AEESP) 50th Anniversary Conference, Golden, CO. *[oral presentation by E.S. Friedman]*

McPhillips, L.E., A.E. Creamer, M.T. Walter, and B.G. Rahm. 2012. Baseline evaluation of groundwater quality in central New York prior to shale gas development. American Geophysical Union Fall Meeting, San Francisco, CA.

Harvey, J.W., J.D. Drummond, B.L. O'Connor, R.L. Martin, A.S. Bhaskar, L.E. McPhillips, A.I. Packman, D.J. Jerolmack, E.J. Henry. Hydrogeomorphology of the Hyporheic Zone: Mobile Bedforms, Dynamic Hyporheic Flow, and Influence on Stream Ecology. American Geophysical Union Fall Meeting, San Francisco, CA. *[oral presentation by J.W. Harvey]*

Walter, M.T., L.E. McPhillips, J.A. Archibald, T.R. Anderson, C.K. Morris. 2012. Hydrologic controls on phosphorus and nitrogen biogeochemistry in agricultural landscapes. American Geophysical Union Fall Meeting, San Francisco, CA. *[oral presentation by M.T. Walter]*

Buchanan, B., L.E. McPhillips, M.T. Walter, S.C. Beyeler, E.A. Kreitinger, and M.B. Fitzgerald, 2012. Baseline evaluation of water quality in the Hudson River Valley in the face of Emerald Ash Borer infestation. Hudson River Environmental Society "Clean Water Act at 40: Facing the Future" Conference, Poughkeepsie, NY..

McPhillips, L.E., M.T. Walter, A.E. Creamer, B. Rahm, and S. Riha, 2012. Baseline evaluation of groundwater quality in central New York in the face of shale gas development. Hudson River Environmental Society "Clean Water Act at 40: Facing the Future" Conference, Poughkeepsie, NY.

McPhillips, L.E. and M.T. Walter, 2012. Teasing out hydrologic and biogeochemical controls on riparian denitrification. Penn State Environmental Chemistry Student Symposium, State College, PA.

McPhillips, L.E. and M.T. Walter, 2011. Teasing out hydrogeomorphic controls on riparian denitrification. American Geophysical Union Fall Meeting, San Francisco, CA.

Walter, M.T., L.E. McPhillips, A.E. Creamer, B. Rahm, S. Riha, J. vonFischer, 2011. Baseline evaluation of groundwater quality in central New York in the face of shale gas development. Cornell University Atkinson Center for a Sustainable Future Annual Committee Meeting, Ithaca, NY.

McPhillips, L.E., J.W. Harvey, A.I. Packman, D.J. Jerolmack, C.R. Tobias, J.K. Bohlke, E.J. Henry, L.G. Larsen, A. Aubeneau, J. Drummond, K. Duernberger, A.H. Sawyer, M. Lettrich, R. Martin, M. Maglio, S. Mroczkowski, S. Stonedahl, 2010. Hydrogeomorphic drivers of stream ecological processes: the 2009 Clear Run studies. American Society of Limnology and Oceanography- North American Benthological Society Joint Meeting, Santa Fe, NM.

Larsen, L. G., J.W. Harvey, L.E. McPhillips, and M. Maglio. 2010. Controls on ecosystem metabolism in restored and unrestored suburban streams: roles of flow, geomorphology, and fine sediment dynamics. American Society of Limnology and Oceanography- North American Benthological Society Joint Meeting, Santa Fe, NM.

McPhillips, L.E., B.L. O'Connor, and J.W. Harvey, 2009. Characterization of eco-hydraulic habitats for examining biogeochemical processes in rivers. American Geophysical Union Fall Meeting, San Francisco, CA.

O'Connor, B.L, J.W. Harvey, and L.E. McPhillips, 2009. The effects of hydraulics, geomorphology, and storm events on metabolism rates in an agricultural river. American Geophysical Union Fall Meeting, San Francisco, CA.

Harvey, J.W., G.B. Noe, L.G. Larsen, D.J. Nowacki, R.W. Schaffranek, and L.E. McPhillips, 2008. Eco-hydraulic relationships governing surface-water flow across the Everglades. Greater Everglades Ecosystem Restoration (GEER) Policy, Planning, and Science Meeting, Naples, FL.

L. McPhillips (07/2013)

Harvey, J.W., G.B. Noe, L.G. Larsen, D.J. Nowacki, R.W. Schaffranek, and **L.E. McPhillips**, 2008. Eco-hydraulic relationships governing surface-water flow across the Everglades. Society of Wetland Scientists Annual Meeting, Washington, DC.

McPhillips, L.E., B.E. O'Neill, J.M. Grossman, S.M. Tsai, J. Lehmann, and J. E. Thies, 2007. Soil Fungal Communities in Three Amazonian Dark Earth (ADE) Sites Characterized by Molecular Fingerprinting, Isolating Unique Species and Assessing Arbuscular Mycorrhizal Fungi. International Agri-Char Initiative Conference, Terrigal, New South Wales, Australia.

Grossman, J.M., B.E. O'Neill, **L.E. McPhillips**, S.M. Tsai, J. Lehmann, and J. E. Thies, 2007. Microbial ecology of anthrosols: Assessing soil community diversity of bacteria, archaea, and fungi in Amazonian dark earths of Brazil. Ecological Society of America Annual Meeting, San Jose, CA. [*oral presentation by J.M. Grossman*]

McPhillips, L.E. and M.T. Walter, 2007. Snow Distribution Patterns at Land Cover Boundaries in Tompkins County, NY. Cornell Undergraduate Research Board Annual Research Symposium, Ithaca, NY.

McPhillips, L.E., B.E. O'Neill, and J.E. Thies, 2007. Characterizing Fungal Communities of Amazonian *Terra Preta* Soils. Cornell Presidential Research Scholars Senior Symposium, Ithaca, NY.

RELEVANT SERVICE & OUTREACH ACTIVITIES

Outreach

Expanding Your Horizons (EYH) "Water Quality Detectives" Workshop Developer & Coordinator: 2011- present

"Exploring Earth Day" outreach event at Cayuga Nature Center, Demonstration Leader: 2012

Cornell Environmentor program, mentor to undergraduate environmental science majors: 2010- 2012

Washington-Lee High School, Arlington VA, volunteer science fair judge: 2010

Sierra Club Inner City Outings, Washington, DC, volunteer mentor for inner city schoolchildren: 2008-2009

Museum of the Earth, Ithaca NY, volunteer docent: 2003-2007

Leadership

Cornell Biological & Environmental Engineering (BEE) Graduate Student Association Vice President: 2012-2013

Cornell Biogeochemistry, Environmental Science, and Sustainability (BESS) Graduate Student Association Co-President: 2011-2012

Cornell Graduate and Professional Student Association (GPSA) Dept. Representative: 2011- 2012

Grant Review

Cornell Cross-Scale Biogeochemistry and Climate IGERT small grant review panel member: Fall 2011 & 2012

UNDERGRADUATE STUDENTS MENTORED

Caitlin Rose McKinley, B.S. 2015, Cornell U., Project: Baseline groundwater methane patterns in Tompkins Co. NY

Christine Georgakakos, B.S. 2015, Cornell U., Project: Testing a novel camera stream gage

Helen Bergstrom, B.S. 2015, Brown U., Project: Using potentiostats to examine iron-nitrogen dynamics in soils

Rachel Whiteheart, B.S. 2014, Cornell U., Project: Greenhouse gas emissions from stormwater detention basins

Anne Elise Creamer, B.S. 2013, Cornell U., Project: Baseline groundwater methane patterns in central NY

Andrea Fortman, B.S. 2013, Cornell U., Project: Evaluating water quality services of stormwater detention basins

PROFESSIONAL MEMBERSHIPS

American Geophysical Union

Soil and Water Conservation Society