Matthew P Miller

Aquatic Ecologist
United States Geological Survey

Utah Water Science Center
121 West 200 South
Moab, UT 84532

Phone: (435) 259-5495 ext. 4
Email: mamiller@usgs.gov

RESEARCH INTERESTS

Landscape and DOM controls on mercury and arsenic, Hydrologic and biologic controls on DOM and nutrient quantity and quality in streams and lakes, Climatic controls on algal populations.

EDUCATION

Ph.D.	Civil, Environmental & Architectural Engineering, University of Colorado-Boulder	2008
M.S.	Civil, Environmental & Architectural Engineering, University of Colorado-Boulder	2004
B.S.	Zoology, University of Wisconsin-Madison	2000

EMPLOYMENT HISTORY

Aquatic Ecologist 2009-present
U.S. Geological Survey, Utah Water Science Center
Postdoctoral Scholar 2009
Pennsylvania State University, School of Forest Resources
Postdoctoral Research Scientist 2008
University of Colorado, Department of Geography
Graduate Research Assistant 2001-2008
University of Colorado, Department of Civil, Environmental & Architectural Engineering
Graduate Teaching Assistant 2002-2008
University of Colorado, Department of Ecology and Evolutionary Biology
Mentor to Research Experience for Undergraduate (REU) Students 2002-2008
University of Colorado, Department of Ecology and Evolutionary Biology
Environmental Scientist 2006-2007
HDR, Inc., Denver, Colorado
Water Quality Consultant 2004-2005
Monteverde Institute, Monteverde, Costa Rica
High School Science Teacher 2004-2005
Monteverde Friends School, Monteverde, Costa Rica
Research Experiences for Undergraduates (REU) Student 2000
University of Colorado, Department of Ecology and Evolutionary Biology

LABORATORY COURSES TAUGHT AT UNIVERSITY OF COLORADO

- Applied Ecology
- Environmental Biology (Lead Teaching Assistant)

- General Biology
- Principles of Ecology

UNDERGRADUATE STUDENTS MENTORED (current position)

Rebecca Abbey
Katherine Alexander (Ph.D. student at CU-Boulder)
Evyan Borgnis(Res. Assist. at Univ. San Francisco)
Caitlin Cox
Melia Egger (M.A. student at Mich. State Univ.)
Alicia Greene
Robert Hull
Sarah McDougal
Kimberly Portmess
Sintana Vergara (Ph.D. Student at UC-Berkeley)
Kristin Vietti

PEER-REVIEWED PUBLICATIONS (14 Total; *****indicates mentored undergraduate author)

Published

Miller, M.P., D.M. McKnight, S.C. Chapra, M.W. Williams (2009) A model of degradation and production of three pools of dissolved organic matter in an alpine lake. *Limnology and Oceanography*, 54(6), 2213-2227.

Miller, M.P., D.M. McKnight, J. Cullis, A. Greene*****, K. Vietti***,** D. Liptzin (2009) Factors controlling streambed coverage of *Didymosphenia geminata* in two regulated streams in the Colorado Front Range. *Hydrobiologia*, 630, 207-218.

Miller, M.P., D.M. McKnight, S.C. Chapra (2009) Production of microbially derived fulvic acid from photolysis of quinone-containing extracellular products of phytoplankton. *Aquatic Sciences*, 71, 170-178.

Fellman, J.B., **M.P. Miller,** R.M. Cory, D.V. D'Amore, D. White (2009) Characterizing dissolved organic matter using PARAFAC modeling of fluorescence spectroscopy: a comparison of two models. *Environmental Science and Technology*, 43, 6228-6234.

Flanagan, C.M., D.M. McKnight, D. Liptzin, M.W. Williams, **M.P. Miller** (2009) Response of the phytoplankton community in an alpine lake to drought conditions: Colorado Rocky Mountain Front Range, U.S.A. *Arctic, Antarctic, and Alpine Research*, 41(2), 191-203.

Mladenov, N., Y. Zheng, **M.P. Miller**, D.R. Nemergut, T. Legg, B. Simone, C. Hageman, M. M. Rahman, K. M. Ahmed, D.M. McKnight (2009) Dissolved organic matter sources and consequences for iron and arsenic mobilization in Bangladesh aquifers. *Environmental Science and Technology*, doi:10.1021/es901472g.

Tipping, E., H.T. Corbishley, J.F. Koprivnjak, D.J. Lapworth, **M.P. Miller**, C.D. Vincent, J. Hamilton Taylor (2009) Quantification of natural DOM from UV absorption at two wavelengths. *Environmental Chemistry*, 6, 472-476.

Gardner, E.M, D.M. McKnight, W.M. Lewis, **M.P. Miller** (2008) Effects of nutrient enrichment on phytoplankton in an alpine lake, Colorado, U.S.A. *Arctic, Antarctic, and Alpine Research*, 40(1), 55-64.

Miller, M.P., D.M. McKnight, R. M. Cory, M. Williams, R. L. Runkel (2006) Hyporheic exchange and fulvic acid redox reactions in an alpine stream/wetland ecosystem, Colorado Front Range. *Environmental Science and Technology*, 40, 5943-5949.

In Press

Miller, M.P., D.M. McKnight (in press) Comparison of seasonal changes in fluorescent dissolved organic matter among aquatic lake and stream sites in the Green Lakes Valley. *Journal of Geophysical Research-Biogeosciences.*

Cory, R.M., **M.P. Miller**, D.M. McKnight, J. Guerard, P. Miller (in press) Effect of instrument-specific

response on the analysis of fulvic acid fluorescence spectra. *Limnology and Oceanography Methods*.

In Review

Miller, M.P., B. Simone, D.M. McKnight, R. Cory, M.W. Williams, E.W. Boyer (in review) New light on a dark subject: Comment. *Aquatic Sciences*.

Brasher, A., T. Jones, A. Farahi, **M.P. Miller**, K. Kozar (in review) Pacific Islands Stream Monitoring Protocol: Fish, Shrimp, Snails, and Habitat Characterization. *National Resource Report*.

Brasher, A.M.D., C.M. Albano, R.N. Close, Q.H. Cannon, **M.P. Miller** (in review) Pilot protocol implementation: Macroinvertebrate communities and habitat characteristics in Colorado Plateau National Parks. *National Park Service Report*.

In Preparation

Miller, M.P., E.W. Boyer, D.M. McKnight (in preparation) Continental scale characterization of dissolved organic matter in forest stream ecosystems. Target Journal: *Ecosystems*.

Miller, M.P., A.M.D. Brasher, C.M. Albano, R.N. Close, Q.H. Cannon (in preparation) Habitat controls on macroinvertebrate community structure in differing stream types in the arid Southwestern United States. Target Journal: *Freshwater Biology*.

THESES

Miller, M.P. (2008) Interactions between hydrology, dissolved organic matter, and algal populations in the headwaters of Boulder Creek. Ph.D. Thesis. University of Colorado-Boulder. Department of Civil, Environmental & Architectural Engineering.

Miller, M.P. (2004) Effects of hyporheic zone interaction on the biogeochemistry of a headwater stream, Green Lakes Valley, Colorado Front Range, United States. M.S. Thesis. University of Colorado-Boulder. Department of Civil, Environmental & Architectural Engineering.

PRESENTATIONS (16 Total; *****indicates mentored undergraduate author)

2009

McKnight, D.M., **Miller**, **M.P.**, S.C. Chapra, and M.W. Williams. A model of degradation and Production of three pools of dissolved organic matter in an alpine lake. American Geophysical Union (AGU) Fall Meeting. San Francisco, CA.

Simone, B.E., **M.P. Miller**, and D.M. McKnight. Fluorescence spectroscopy: considerations for highly absorbing dissolved organic matter samples. American Geophysical Union (AGU) Fall Meeting. San Francisco, CA.

Culis, J., **M.P. Miller**, and D.M. McKnight. The impact of bed disturbance on the growth of the nuisance diatom *Didymosphenia geminata* in rivers. Front Range Student Ecology Symposium. Fort Collins, CO.

2008

Miller, **M.P.,** D.M. McKnight, and S. Chapra. Modeling DOM transport in an alpine ecosystem. University of Lancaster, UK.

Miller, **M.P.,** D.M. McKnight, and S. Chapra. Reactive transport modeling of DOM in an alpine lake. AGU Chapman Conference on organic matter fluorescence. University of Birmingham, UK.

McKnight, D.M., **M.P. Miller**, S. Chapra, M. Williams, and E.L. Borgnis*****. Photochemical transformation of humic DOM quality in an alpine lake. American Society of Limnology and

Oceanography (ASLO) Summer Meeting. St. John's, Newfoundland.

Miller, M.P. and D.M. McKnight. Source and reactivity of three pools of DOM in an alpine lake. Global Lakes Ecological Observatory Network (GLEON). Lake Placid, FL.

2007

Miller, M.P., D.M. McKnight, and E.L. Borgnis*****. Sources of DOM to alpine surface waters: In-lake vs. watershed production. American Geophysical Union (AGU) Fall Meeting. San Francisco, CA.

Cox, C.N.*****, D.M. McKnight, and **M.P. Miller**. Copper binding depending on source and chemical quality of DOM in the Colorado Front Range. American Geophysical Union (AGU) Fall Meeting. San Francisco, CA.

Mladenov, N., Y. Zheng, **M.P. Miller**, C. Hageman, and D.M. McKnight. Evaluation of redox processes in groundwater by fluorescence spectroscopy: Applications in Bangladesh. Geological Society of America (GSA) Annual Meeting. Denver, CO.

Miller, M.P. and D.M. McKnight. Alpine lake processing of DOM: Hydrologic and biologic controls. Gordon Research Conference (Catchment Science), New London, NH.

Greene, A.*****, K. Vietti*****, D.M. McKnight, and **M.P. Miller.** Effect of summer storms on *Didymosphenia geminata* growth and streambed coverage in sub-alpine streams in Colorado. ASLO Aquatic Sciences Meeting. Santa Fe, NM.

2006

Miller, M.P., D.M. McKnight, and K. Alexander*****. Tracing changes in carbon chemistry caused by an extreme mid-summer rain event in the Colorado Rocky Mountains. American Geophysical Union (AGU) Fall Meeting. San Francisco, CA.

2005

Miller, M.P., D.M. McKnight, R.M. Cory, M.W. Williams, and R.L. Runkel. Hyporheic exchange and humic redox reactions in an alpine stream/wetland ecosystem. Gordon Research Conference (Catchment Science), Colby College, ME.

McKnight, D.M.; **M.P. Miller**; R.M. Cory; and M.W. Williams. Humic redox reactions influencing nutrient and metal transport in mountain streams. ASLO Aquatic Sciences Meeting. Salt Lake City, UT.

2003

Miller, M.P. and D.M. McKnight. Biogeochemistry in the hyporheic zone of an alpine stream. Long Term Ecological Research (LTER) All Scientist's Meeting, Seattle, WA.

FELLOWSHIPS AND AWARDS

Global Lake Ecological Observatory Network Travel Fellowship	2008
Letter of Teaching Excellence from Chair for Graduate Studies (Univ. of Colorado-Boulder)	2008
American Water Resources Association Scholarship	2005

INVITED GUEST LECTURES

Watershed Management (Penn State Univ.)	2009
Snow Hydrology (Univ. of Colorado-Boulder)	2008
Advanced Aquatic Chemistry (Univ. of Colorado-Boulder)	2008
Stream Ecology (Univ. of Colorado-Boulder)	2005-2008
Applied Ecology (Univ. of Colorado-Boulder)	2005-2008

JOB-RELATED CERTIFICATES/TRAINING

Workshop on Deploying and Operating *In Situ* Optical Sensors	2009
Graduate Certificate in Hydrologic Sciences (Univ. of Colorado-Boulder)	2008
Workshop on End Member Mixing Analyses (EMMA)	2006
Niwot Ridge Annual Snow Survey	2006
Workshop on Parallel Factor Analysis (PARAFAC) of Dissolved Organic Matter	2005

PROFESSIONAL SERVICE AND OUTREACH

Upper Colorado River Basin Science Planning Committee	2009
Stream Observational Network Experiment (STREON) Planning Committee	2008
Lead of Dissolved Organic Matter Characterization Workshops	2007-2008
Coordinator for INSTAAAR Open House Stream Activities with 8th Graders	2006-2008
Graduate Student Search Committee for New Faculty Hire (Univ. of Colorado-Boulder)	2007
Co-Chair, Hydrologic Sciences Symposium (Univ. of Colorado-Boulder)	2006

JOURNAL ARTICLE REVIEWS (13 Total, 2007-2009)

- Aquatic Geochemistry
- Biogeochemistry
- Environmental Science and Technology
- Freshwater Biology
- International Journal of Environmental Analytical Chemistry
- Journal of Geophysical Research-Biogeosciences
- Polish Journal of Environmental Studies
- Water Management
- Water Research

PROFESSIONAL AFFILIATIONS

- American Geophysical Union (AGU)
- American Society of Limnology & Oceanography (ASLO)
- Global Lake Ecological Observatory Network (GLEON)