

Michelle A. Baker

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Education

Ph.D. 1998 Biology, University of New Mexico, Albuquerque, NM
B.S. 1992 Biology (with Honors), Lafayette College, Easton, PA

Professional Appointments

1999 – present Assistant then Associate Professor, Department of Biology,
Utah State University
1998 – 1999 Postdoctoral Fellow, Centre d'Ecologie des Systèmes
Aquatiques Continentaux, CNRS/Université Paul Sabatier,
Toulouse, France
1992 – 1998 Research/Teaching Assistant, Department of Biology,
University of New Mexico

Academic Interests

Biological and hydrological controls of water quality
Stream and watershed ecology and biogeochemistry
Stable isotopes in ecology and hydrology

Professional Affiliations

American Geophysical Union
American Society of Limnology and Oceanography
American Water Resources Association
Ecological Society of America
North American Benthological Society

Awards

Best Paper Award, Soil Science Society of America Annual Meeting, for Van
Miegroet, H., J. Boettinger, and M. Baker "Soil organic quality in wildland
soils: what is it and why is it important?" 2006
USU Mortar Board Top Professor, 2005
Hynes Award for New Investigators, An award recognizing excellence in benthic
science for an influential paper published by a young scientist. The North
American Benthological Society, 2001
NSF-NATO Postdoctoral Fellowship, 1998
Wildco Award for Best Oral Presentation by a Student in Basic Research, North
American Benthological Society, 1998
Outstanding Student Presentation Award, Hydrology Section, American
Geophysical Union Fall Meeting, 1996
Willis Roberts Hunt Prize, Awarded to the student showing most promise for a
career in Biology, Lafayette College, 1992

Journal Articles (peer-reviewed)

* Indicates graduate student co-author

‡ Indicates undergraduate student co-author

- Goodman, K.J.*, **M.A. Baker**, and W.A. Wurtsbaugh. In revision. Mountain lakes increase stream cellulose decomposition potential. *Journal of the North American Benthological Society*.
- Goodman, K.J.*, A.R. Benedetto‡, and **M.A. Baker**. In review. Dissolved organic matter (DOM) photobleaching in subalpine oligotrophic stream-lake systems: implications for DOM bioavailability and heterotrophic processing. *Limnology and Oceanography*.
- Hall, R.O. Jr., **M.A. Baker**, C.D. Arp*, and B.J. Koch*. In press. Hydrologic control of nitrogen removal, storage and export in a mountain stream. *Limnology and Oceanography*.
- Baker, M.A.**, G.deGuzman‡, and J. D. Ostermiller. 2009. Differences in nitrate uptake among benthic algal assemblages in a mountain stream. *Journal of the North American Benthological Society* 28: 24-33.
- Biggs, M.A.*, M.N. Gooseff, C.D. Arp*, and **M.A. Baker**. 2009. Informing a stream transient storage model with two-storage zones to discriminate in-channel dead zones and hyporheic exchange. *Water Resources Research* 45: W00D27 doi:10.1029/2008/WR006959.
- Marcarelli, A.M.*, **M.A. Baker** and W.A. Wurtsbaugh. 2008. Is in-stream nitrogen fixation an important nitrogen source for benthic communities and stream ecosystems? *Journal of the North American Benthological Society* 27:186-211.
- 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.
- Tank, J.L., E.J. Rosi-Marshall, **M.A. Baker**, and R.O. Hall, Jr. 2008. Are rivers just big streams? Using a pulse method to measure nitrogen demand in a large river. *Ecology* 89:2935-2945.
- Vinson, M.R. and **M.A. Baker**. 2008. Poor growth of rainbow trout (*Oncorhynchus mykiss*) fed New Zealand mud snails (*Potamopyrgus antipodarum*). *North American Journal of Fisheries Management* 28:701-709.
- Arp*, C.D. and **M.A. Baker**. 2007. Discontinuities in stream nutrient uptake below lakes in mountain drainage networks. *Limnology and Oceanography* 52: 1978-1990.
- Arp*, C.D., J.C. Schmidt, **M.A. Baker**, and A.K. Myers‡. 2007. Stream geomorphology in a mountain lake district: Sediment links, lake-modified hydraulics, and downstream lake effects. *Earth Surface Processes and Landforms* 32: 525-543.
- Myers‡, A.K., A.M. Marcarelli*, C.D. Arp*. **M.A. Baker**, and W. Wurtsbaugh. 2007. Disruptions of stream sediment size and stability by lakes in mountain

- watersheds: potential effects on periphyton biomass. *Journal of the North American Benthological Society* 26:234-245.
- Arp*, C.D., M.N. Gooseff, **M.A. Baker**, and W. Wurtsbaugh. 2006. Surface-water hydrodynamics and regimes of a small mountain stream-lake ecosystem. *Journal of Hydrology*. 329:500-513.
- Mendelson, J.R. III, E.D. Brodie, Jr., J.M. Malone, M.E. Acevedo, **M.A. Baker**, N.J. Smatresk, and J.A. Campbell. 2005. Amphibian chytridomycosis in Guatemala: Decline of a cloud-forest frog fauna. *Revista en Biología Tropical- Journal of Tropical Biology* 54:991-1000.
- Van Miegroet, H., J.L. Boettinger, **M.A. Baker**, J. Nielsen[‡], D. Evans[‡], and A. Stum[‡]. 2005. Soil carbon distribution and quality in a montane rangeland-forest mosaic in northern Utah. *Forest Ecology and Management*. 220:284-299.
- Valett, H.M., **M.A. Baker**, J.A. Morrice, C.S. Crawford, M.C. Molles, C.N. Dahm, D.L. Moyer, and J.R. Thibault. 2005. The flood pulse in a semi-arid riparian forest: metabolic and biogeochemical responses to inter-flood interval. *Ecology* 86:220-234.
- Baker, M.A.** and P. Vervier. 2004. Hydrologic variability, organic matter supply, and denitrification in the Garonne River ecosystem. *Freshwater Biology*. 49:181-190.
- Dahm, C.N., **M.A. Baker**, D.I. Moore, and J.R. Thibault. 2003. Biogeochemistry of surface waters and alluvial ground waters in streams and rivers during drought. *Freshwater Biology* 48:1219-1231.
- Vervier, P., L. Roques, **M.A. Baker**, F. Garabetian and P. Auriol. 2002. Biodegradation of dissolved free simple carbohydrates in surface, hyporheic and riparian waters of a large river. *Archiv für Hydrobiologie* 153:595-604.
- Baker, M.A.**, H.M. Valett, and C.N. Dahm. 2000. Organic carbon supply and metabolism in a near-stream groundwater ecosystem. *Ecology* 81:3133-3148.
- Baker, M.A.**, C.N. Dahm, and H.M. Valett. 1999. Acetate retention and metabolism in the hyporheic zone of a mountain stream. *Limnology and Oceanography* 44:1530-1539.
- Valett, H.M., C.N. Dahm, M.E. Campana, J.A. Morrice, **M.A. Baker**, and C.S. Fellows. 1997. Hydrologic influences on groundwater-surface water ecotones: heterogeneity in nutrient composition and retention. *Journal of the North American Benthological Society* 16:239-247.
- Daehler, C.C., **M.A. Baker**, J. Merkle, and S.K. Majumdar. 1994. Elemental processing in leaf litter and sediments in an aquatic system: effects of anthropogenic pollution. *International Journal of Ecology and Environmental Sciences* 20:287-302.
- Baker, M.A.**, C.C. Daehler, and S.K. Majumdar. 1992. Heterotrophic bacteria and fungi associated with decomposing leaves submerged in a lake in Pennsylvania, USA. *International Journal of Ecology and Environmental Sciences* 18:1-15.

Bobrin, B.D., R.K. Kang, **M.A. Baker**, G.S. Ahearn, C.C. Daehler, and S.K. Majumdar. 1992. In vitro cytotoxicity of carboplatin on human breast adenocarcinoma and normal fetal lung cells. *The Nucleus* 34:123-129.

Majumdar, S.K. E.P. Daly, K.M. Kleemeyer, C.C. Daehler, and **M.A. Baker**. 1991. Genotoxic effects of gossypol acetic acid on cultured murine erythroleukemia cells. *Environmental and Molecular Mutagenesis* 18:212-219.

Book Chapters and Conference Proceedings (peer reviewed)

Wurtsbaugh, W.A., and **M.A. Baker**. 2008. Lake landscapes buffer nutrient flux and algal production in mountain watersheds. *Verh. Internat. Verein. Limnologie*. In press.

Wurtsbaugh, W.A., **M.A. Baker**, H.P. Gross, and P.D. Brown[‡]. 2005. Lakes as nutrient "sources" for watersheds: a landscape analysis of the temporal flux of nitrogen through sub-alpine lakes and streams. *Verh. Internat. Verein. Limnologie*. 29:645-649.

Baker, M.A., C.N. Dahm, and H.M. Valett. 2000. Anoxia, anaerobic metabolism biogeochemistry of the stream water- ground water interface. Pages 259-284 In J.B. Jones, Jr. and P.J. Mulholland (eds.) *Streams and Ground Waters*. Academic Press, San Diego.

Baker, M.A., C.N. Dahm, H.M. Valett, J.A. Morrice, M.E. Campana, and G.J. Wroblicky. 1994. Spatial and temporal variation in methane distribution at the ground water- surface water interface in headwater catchments. Pages 29-37 In J.A. Stanford and H.M. Valett (eds.) *Proceedings of the Second International Conference on Ground Water Ecology*. AWRA, Herndon, VA.

Baker, M.A., J. Merkle, and S.K. Majumdar. 1994. Implications of pollutants on diversity of aquatic bacteria and fungi. Pages 114-122 In S.K. Majumdar, F.J. Brenner, J.E. Lovich, J.F. Schalles, and E.W. Miller (eds.) *Biological Diversity: Problems and Challenges*. Pennsylvania Academy of Science, Philadelphia, PA.

Wroblicky, G.J., M.E. Campana, C.N. Dahm, H.M. Valett, J.A. Morrice, K.S. Henry, and **M.A. Baker**. 1994. Simulation of stream-groundwater exchange and near-stream flow paths of two first order mountain streams using MODFLOW. Pages 187-198 In J.A. Stanford and H.M. Valett (eds.) *Proceedings of the Second International Conference on Ground Water Ecology*. AWRA, Herndon, VA.

Miller, E.W., **M.A. Baker**, and S.K. Majumdar. 1992. Epilogue: United Nations sponsored 1992 Earth Summit in Rio de Janeiro- where do we go from here? Pages 551-554 In S.K. Majumdar, L.D. Kalkstein, B.M. Yarnal, E.W. Miller, and L.M. Rosenfeld (eds.) *Global Climate Change: Implications, Challenges and Mitigation Measures*. Pennsylvania Academy of Science, Philadelphia, PA.

Other Articles and Reports (non-peer reviewed)

Baker, M.A., S.J. Hochhalter*, and E.J. Lytle[‡]. 2008. Research to inform nutrient endpoints in East Canyon Creek, Utah. Report to the Utah Division of Water Quality. 77 pages.

Baker, M.A. 2003. Improving quantitative understanding using spreadsheet models. *Ecology*. 83:3524-3525.

Covich, A.P., **M.A. Baker**, R. Behneke, D.W. Blinn, L.M. Carter, J. Chambers, T.A. Crowl, J.P. Dobrowolski, C.P. Hawkins, C. Luecke, J. Miller, L.N. Poff, F.J. Rahel, J.C. Schmidt, S.Selby, A.L. Sheldon, M. Vinson, and F.H. Wagner. 2003. Natural Ecosystems II- Aquatic Ecosystems. Pages 185-205 in Wagner, F.H. (Ed.). Rocky Mountain/Great Basin Regional Climate Change Assessment. Report for the U.S. Global Change Research Program. Logan, UT.

Baker, M.A. 2001. Ecology readings from the University of Wisconsin. *Ecology*. 82(1):262.

Weiler, C.S. and DIALOG III Participants. 2000. Perspectives on graduate education: Experience in aquatic science. *Bulletin of the American Society for Limnology and Oceanography*. 9(2):20-22.

Invited Conferences and Symposia

Gordon Research Conference: The Metabolic Basis of Ecology. Bates, ME. July 2004.

Council on Undergraduate Research Posters on the Hill, Washington, DC. April 2004.

Aquatic Ecosystems Workshop Group. Assessment of Climate Change Effects on Aquatic Ecosystems of the Great Basin-Rocky Mountain Region. February 2000.

DIALOG III Conference for recent Ph.D. recipients in Limnology and Oceanography, St. George, Bermuda. October 1999.

COST Action 67 (European Union) Management Committee - Chemodynamics and water quality protection in natural porous media. Castellon, Spain. November 1998.

Invited Presentations (also senior author of 17 presentations and co-author of 46 presentations at conferences)

Baker, M.A. 2009. Biochemical oxygen demand in rivers. Jordan River Dissolved Oxygen Linkage Symposium, Salt Lake City, UT.

Baker, M.A. 2008. Plenary speaker. Nutrient processes in aquatic ecosystems. Utah Non-Point Source Pollution Annual Conference, Cedar City, UT.

Baker, M.A. 2006. Ecological basis for site-specific TMDL targets in Utah. EPA Region 8 Bioassessment Workshop. Utah State University.

Baker, M.A. 2005. Fluvial discontinua- influence on flowpaths and ecosystem processes. Stream Ecology Symposium. Idaho State University.

Baker, M.A. 2002. Ceci n'est pas une pipe- Understanding nutrient uptake and flux in stream ecosystems. Department of Biology. Utah State University.

- Baker, M.A.** 2001. Hydrologic linkages and ecosystem function. Department of Botany and Range Science, Brigham Young University.
- Baker, M.A.** 2001. Tricks of the trade: how to succeed in graduate school. North American Benthological Society Annual Meeting, La Crosse, WI.
- Dahm, C.N. and **M.A. Baker**. 2000. Dissolved organic carbon dynamics and the groundwater and surface water interface. Geological Society of America 2000 Annual Meeting.
- Dahm, C.N. and **M.A. Baker**. 2000. Organic matter dynamics at the groundwater - surface water interface of a mountain stream. American Society of Limnology and Oceanography Aquatic Sciences Meeting, Copenhagen.
- Baker, M.A.** 2000. Beyond the riparian zone: Aquatic-terrestrial linkages in watersheds. Utah State University, Department of Fisheries and Wildlife, and Civil and Environmental Engineering.
- Baker, M.A.** 1999. Organic carbon retention and metabolism in near-stream groundwater. DIALOG Symposium, American Society for Limnology and Oceanography, BBSR, St. George, Bermuda.
- Baker, M.A.** 1999. Role of hydrologic linkages in fluvial ecosystem structure and function. University of Washington Tacoma, Utah State University, University of New Hampshire.
- Baker, M.A.** 1998. Influence de l'hydrodynamique sur la structure et le fonctionnement des écosystèmes fluviaux: des ruisseaux aux grands cours d'eau. Centre d'Ecologie des Systèmes Aquatiques Continentaux, Toulouse, France.
- Baker, M.A.** 1998. Influence of hydrologic linkages on fluvial ecosystem structure and function. School of Forestry and Environmental Studies, Yale University.

Extramural Research Funding

National Science Foundation

Ecosystem Studies Program (DEB 09-22153) August 2009-2013
Collaborative Research: Using empirical and modeling approaches to quantify the importance of nutrient spiraling in rivers (PI; other PIs are JL Tank, M Sivapalan, EJ Rosi-Marshall and RO Hall) \$152,647

South Valley Water Reclamation Facility

Nutrient limitation of benthic algae in the Jordan River (PI) June 2009- December 2009 \$31,089

Utah Division of Water Quality

Research to develop tools for nutrient criteria for streams in Utah (PI) December 2006 – June 2009 \$125,720

National Science Foundation

Ecosystem Studies Program (DEB 05-19327) September 2005-2010
Collaborative Research: Landscape limnology of mountain watersheds: Nutrient retention and ecosystem stability in complex aquatic ecosystems (co-PI; other PIs are W Wurtsbaugh and B McGlynn) \$1,043,959
(plus REU Supplements)

National Science Foundation

Hydrological Sciences Program (EAR 04-09534) July 2004-2008
Collaborative Research: Controls on hyporheic nitrate retention- discriminating among transport, reaction rate, and substrate limitation (PI; other PIs are MN Gooseff, R Haggerty, S Wondzell) \$191,792

National Science Foundation

Ecosystem Studies Program (DEB 01-32983) March 2002-2005
Influence of stream-lake interactions on nutrient transport and function of aquatic ecosystems (co-PI; other PIs are W Wurtsbaugh, J Haefner and RO Hall) \$1,008,140
(plus REU supplements)

National Science Foundation

NSF-NATO Postdoctoral Fellowship (DGE 98-04645) September 1998-1999
Hydrologic variability, organic matter supply, and denitrification in the Garonne River (PI) \$37,900

Teaching Experience

Formal Courses

Biology 1010	Biology and the Citizen, 3 credits, ca. 200 students, undergraduate non-majors. Spring semesters (2000-2004)
Biology/NR 2220	General Ecology, 3 credits, ca. 80 students, undergraduate majors. Spring semesters (2001-2009, maternity leave 2006, sabbatical leave 2008), Fall semester 2009
Biology 4750/6750	Special Topics, 2-3 credits, ca. 2-10 students, undergraduate and graduate majors. (content varies – past topics include Aquatic Biogeochemistry, Ecological Stoichiometry, Groundwater Ecology, Water-Earth-Biota, Interdisciplinary Research in Ecology and Hydrology, Women in Science). Fall semesters (2000-2004, 2008) Spring semesters (2006-2006)
Biology 6960	Graduate Ecology, 5 credits, ca. 20 students, graduate ecology majors, team taught. Fall semesters (2001-2006)

Student Mentoring

Graduate Students	Christopher Arp*‡ – Ph.D. 2006
* EPA-STAR Fellow	Keli Goodman† – Ph. D. in progress
‡ INRA Subsurface Science Fellow	Sam Hochhalter* – M.S. 2009
	Andrew Myers – M.S. 2008
	John Rothlisberger – M.S. 2004
	Scarlett Vallaire – M.S. in progress
Undergraduate Research	Norman Balls – 2005-2006
* Research Experience for Undergraduates (NSF funding supplement)	Angie Benedetto* – 2006-present
	Joe Crawford – 2008 – present
	Ryan Davis – 2001
	Glen de Guzman*‡ – 2002-2003
‡ USU Minority Science Fellow	Lisa Jeffs* – 2001- 2003
	Evan Lytle† – 2007-2009
+ USU Eccles Undergraduate Research Fellow	Andrew Myers* – 2003-2005
	Julia Nielsen – 2001-2003
	Soo-Hyun Park – 2001-2002
	Jason Reed – 2008
	Brandon Spencer – 2000
	Lisa Tran – 2005-2006

Professional Service

Member, Program Committee, 2010 ASLO/NABS Joint Annual Meeting, 2008-present
Panelist, Geosciences Directorate, National Science Foundation, May 2005, March 2007-September 2008
Panelist, Biological Sciences Directorate, National Science Foundation, February 2009
Associate Editor, Journal of the North American Benthological Society, June 2001-present
Member, Elections and Place Committee, North American Benthological Society, 1996-1997, 2007-present
Chair, Special Sessions, Annual Meeting of the North American Benthological Society, 2007-2008
Member, Executive Committee, North American Benthological Society, June 2003-2006
Special Session co-organizer, American Society for Limnology and Oceanography, 2002
Graduate Resources Committee, North American Benthological Society, 1997-1998
Peer review: Journal of the North American Benthological Society, Limnology and Oceanography, Biogeochemistry, Water Resources Research, Ecology, BioScience, Biogeosciences, Proceedings of the National Academy of Science
Ad hoc proposal review: National Science Foundation (EAR- Hydrologic Sciences, DEB- Ecosystem Studies, BE- Coupled Biogeochemical Cycles); NIWR-USGS National Competitive Grants Program, European Union Young Investigator Award

University Service

College of Science Representative, USU Vice Provost Advisory Council, 2008-2010
College of Science Representative, USU Sustainability Council, 2008-2009
Member, Promotion & Tenure Committee (Biology), 2009-present
Member, Promotion & Tenure Committee (BIE), 2008-present
Member, Faculty Senate Ad Hoc Committee to Review the USU Faculty Code, 2008
Member, Graduate Programs Committee (Biology), 2006-present
Member, Women and Gender Research Institute Steering Committee, 2006-present
Member, Ecology Center Advisory Committee, 2005-present
Member, Promotion & Tenure Committee (Biology), 2005-present
Member, Water Initiative University Advisory Committee, September 2003- present
Member, College of Science Dean Search Committee 2006
Member, Post-tenure Review Committee (Biology), 2005
Chair, Water Initiative Graduate Program Committee, 2004-2006
Member, Water Initiative Laboratory Watershed Committee, September 2003-2006
Undergraduate Research Mentor, Utah State Minority Science Fellows, 2002-2004
Member, Hydrologist Search Committee, Department of AWER, 2005
Member, Pre-Health Professions Committee, Department of Biology, 2001-2004
Panelist, Scholars Day, Office of Admissions Interview Panel, 2004
Member, Spatial Ecologist Search Committee, Department of Biology, 2004
Member, Water Initiative Task Force for Utah State President Hall, 2002 -2003
Member, Public Health Search Committee, Department of Biology, 2001

Community Service

Member, Jordan River Technical Advisory Committee (Salt Lake City), 2009
Research mentor, Undergraduate Posters on Capitol Hill (Salt Lake City), 2003 and 2008
Research mentor, CUR Posters on the Hill in Washington DC, 2004
Research mentor for high school students in NASA sponsored Science Camp, USU, 2006
Outreach - SciTech High School, Logan UT, 2006