

**LAWRENCE A. BAKER, Ph.D**

Research Professor

Condensed vita

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**PROFILE**

My research applies my hybrid education in environmental engineering and ecology to the study of *applied biogeochemistry*, with a focus on human ecosystems – cities and farms. I like to work in “Pasteur’s quadrant”, moving between theory and application. My research is highly interdisciplinary, and I often lead interdisciplinary research groups. In recent years, I have been very active in various synergistic activities, including many workshops on urban sustainability, both as an organizer and participant. In recent years, I’ve also become interested environmental governance, especially with respect to developing resilient water and nutrient management in cities.

**EDUCATION**

Ph.D. Environmental Engineering Sciences, University of Florida.

M.S. Civil and Environmental Engineering, Utah State University.

B.S. Biology, Pennsylvania State University (emphasis in aquatic ecology).

**EXPERIENCE**

2012- Faculty affiliate, International Center for Global Change, University of Minnesota.

2011- Research Professor, Dept. of Bioproducts and Biosystems Engineering,  
University of Minnesota.

2009 Fulbright Senior Specialist, International Institute of Water and Environmental  
Engineering, Ouagadougou, Burkina Faso.

2008- WaterThink, LLC (owner).

2004-2007 Water Resources Science Program (U of M) Executive Committee.

2001-2011 Senior Fellow, Water Resources Center, University of Minnesota.  
Graduate Faculty (Senior Standing), Water Resources Science Program.

1999-2002 Independent environmental consultant.

1992-1999 Assist. Professor, Department of Civil and Environmental Engineering, Arizona  
State University.

1989-1991 Technical Director, Synthesis and Integration Project, Surface Water  
Acidification, EPA’s Corvallis Environmental Research Laboratory.

1987-1992 Research Associate, University of Minnesota. On loan to EPA 1989-1991.

### **PROFESSIONAL SERVICE**

- 2016- Water Council, University of Minnesota.
- EPA's Board of Scientific Counselors, Subcommittee on Safe and Sustainable Water Resources, September 2014-September 2017.
- \*NSF "white paper" workshops on Innovation at the Nexus of Food, Water, and Energy:
  - Food Systems, University of Nebraska, Lincoln, Feb. 22-24, 2016.
  - P Sustainability Research, Chemistry Division, May 18-19, 2015, Washington, DC.
- Recent NSF proposal review panels: Sustainability Engineering (2009); IGERT (2010); Coupled Human-Natural Systems (2012).
- Agricultural Advisory Group, Minnesota Nutrient Management Strategy, 2014.
- Academic Mission Advisory Board, UMore Park (eco-village), University of Minnesota, 2013-2014.
- Integrating Social Science into CLEANER, NSF workshop, Alexandria, VA, January 24-25, 2007.
- Planning/Program Committees: Minnesota Water Conference, 2004-2006; Water Environment Federation (Surface Water Quality/Ecology subcommittee), 1997-2000; Arizona Water Pollution Control Association, 1994; American Society for Limnology and Oceanography, 1985 National Conference, Minneapolis, MN.
- Chairman, Human Health Subcommittee, AZ Comparative Environmental Risk Project (1994-1995). Governor-appointed committee ranked environmental risks in Arizona. *Received Governor's Award for leadership of this project.*

### **RESEARCH GRANTS (past 15 years only)**

1. Peterson, J., L. Baker, R. Hozalsky, J. Gulliver, J. Finlay, J. Chapman. Stormwater research priorities and pond maintenance, Minnesota Pollution Control Agency, \$550,000, 4/27/16-4/30/18.
2. Waste Not: Closing the Loop on Organics Wastes for the Twin Cities. PI, with T. Smith, W. Lazarus, R. Ruan, G. Shurson, C. Rosen, S. Hughes, Food Ventures Program (MNDrive), \$620,000, awarded 6/18/14.
3. Creation of a Parkinson Disease Registry and Initial Studies to Address Its Causes and Genetic Susceptibility, co-PI with Tim Church and 10 others, U of M MnDrive, \$500,000 awarded 7/1/14.
4. International WaTERS Research and Training Network (Water-related Training, Education and Research in the global South), co-applicant with Leila Harris (PI) and 8 others, Social Science Research Council of Canada, \$200,000, awarded 3/28/14.
5. RCN - SEES: Sustainable Cities - People and the Energy-Climate-Water Nexus. Co-PI, with Anu Ramaswami and others, NSF, \$750,000, 2013-2017.

6. Understanding drivers of whole-household energy conservation using data from the Twin Cities Household Ecosystem Project. PI, with J. Coggins and K. Nelson, Institute for Renewable Energy and the Environment, \$70,000, 2011-2013.
7. \*Twin Cities Urban Sustainability Forum. PI, with C. Schively-Slotterback, co-funded by NSF, the McKnight Foundation, the Center for Regional Affairs and the Center for Transportation Studies, \$78,000, 2011-2013.
8. Connecting people, land, and water in urban ecosystems. Co-PI, with Sarah Hobbie (PI), K. Nelson, and C. Schively-Slotterback, Institute on the Environment, \$400,000, 2011-2014.
9. Quantifying phosphorus load reductions from street sweeping. PI, with S. Hobbie, Minnesota Pollution Control Agency, EPA, \$285,970, 2010-2014.
10. New tools for TMDL P load reductions. PI, with J. Nieber and B. Wilson, Minnesota Pollution Control Agency, EPA, \$298,175, 2010-2014.
11. Symposium: Urban ecosystems and human well-being: integrating social and ecological knowledge. PI, University of Minnesota, Minnesota Futures Program, \$25,000, 2009-2010.
12. Twin Cities Household Ecosystem Project. PI, with J. McFadden, S. Hobbie, K. Nelson, and J. King, NSF Coupled Human Natural Systems Program, \$1.5 million, 2009-2013.
13. Integration of choice into biogeochemical models of urban ecosystems. PI, with P. S. Hobbie, J. King, J. McFadden, K. Nelson, NSF Coupled Human Natural Systems Program, \$550,000, 2007-2009.
14. Synthesis workshop: Water Environment of Cities (book project). PI, NSF. \$49,000, 2007-2008.
15. Assessment of stormwater management practices on the water quality of runoff. Collaborator, with Gulliver, J. and J. Anderson (PIs), MN Pollution Control Agency, \$480,000, 2005-2006.
16. \*Coupled biogeochemical cycles in human ecosystems: hydrology, stoichiometry, connectiveness, and culture. PI, with five others, NSF Biocomplexity Initiative, \$355,000, 2003-2005.
17. Hotspots of landscape change: identifying key linkages between water quality and land development patterns in riparian areas of the north central region. U. S. Forest Service, PI, with M. Renwick. U.S. Forest Service, \$106,900, 2002-2004.
18. Characterizing salinity contributions in sewer collection and reclaimed water distribution systems to develop salinity management strategies, Co-PI with CH<sub>2</sub>M Hill and NRC Engineering. American Water Works Assoc. Research Foundation, \$705,000, 2002-2004 (independent consulting).
19. Model of coupled biogeochemical cycles for human dominated ecosystems. NSF-CBC Incubation Study, co-PI, \$100,000, 2001-2002.

20. Algae-related water quality problems in Phoenix's water supply. With P. Westerhoff and M. Sommerfeld. \$1.2 million, City of Phoenix, 1999-2001 (proposal PI; project consultant after leaving ASU).
21. Management of nitrate-contaminated groundwater in the SRP service area. P.I., with P. Johnson and Ying Xu (co PIs), 1999-2000, \$42,000.
22. Algae-related water quality problems in the Verde River reservoirs. PI with P. Westerhoff. Salt River Project, \$48,731, 1998-1999.
23. Central Arizona-Phoenix Urban Long-Term Ecological Research Program. NSF-SP (internal co-PI), with N. Grimm and C. Redman (NSF PIs) and 7 other internal co-PIs. National Science Foundation, \$4,199,938, 1998-2003.

### **HONORS AND AWARDS**

- "Outstanding River Community Group", awarded to the Friends of the Sunrise River, which I chaired, by Minnesota Waters (2010).
- Listed in *Who's Who in America*. 58<sup>th</sup> ed., 2004.
- Best Teacher, AZ Student Chapter of the American Society Civil Engineering, Fall 1997.
- Governor's Recognition Award (for chairing the Human Health Committee of the Arizona Comparative Environmental Risk Project), 1996.
- ASU Wakonsee Fellowship (teaching excellence), 1994.
- Faculty advisor (student-elected), ASU Chi Epsilon (engineering) Honor Society, 1995.
- Best Journal Article (1990 *Nature* article), Corvallis EPA Research Laboratory, Fall 1990.
- Sommerfeld Doctoral Fellowship, Department of Civil Engineering, U. of Minnesota, 1981-82 and 1982-83.
- President, Environmental Engineering Graduate Student Associations at the U. of Florida (1980) and at U. of Minnesota (1982).

### **RECENT CONSULTING CLIENTS**

Minnesota Center for Environmental Advocacy – ongoing (confidential).

Northeastern Minnesota Friends of Wilderness - analysis of potential impacts of a large copper mine, 2013-2015.

UMore Park – analysis of water in the UMore Park (ecovillage), 2011.

Midwest Environmental Advocates – testimony on water quality impacts of cooling tower blowdown from an ethanol plant.

Minnesota Center for Environmental Advocacy – testimony on various water quality regulations; testimony on water quality problems with a copper and iron mining (various projects, 2006-2015); testimony for ethanol plant EAW, 2009.

American Water Works Research Foundation - analysis of salt sources in municipal water systems (with CH2MHill), 2002-2004.

City of Phoenix Water Services Department – project to reduce tastes and odors in water supplies (with ASU), 1999-2002.

## **SCHOLARLY PUBLICATIONS**

**Total citations > 2,400**

### **BOOKS**

1. Baker, L.A. (editor). 2009. *The Water Environment of Cities*. Springer Scientific, Boston, MA.
2. Baker, L.A. (editor). 1994. *Environmental Chemistry of Lakes and Reservoirs* Advances in Chemistry #237, American Chemical Society Books, Washington, D.C.

### **JOURNAL EDITING**

- Guest co-editor (with C. Kennedy, S. Dhaka, and A. Ramaswami), Special Issue on Urban Sustainability, *Journal of Industrial Ecology* (December 2012).
- Associate Editor, *Urban Ecosystems* (2001-2014).

### **JOURNAL ARTICLES AND BOOK CHAPTERS**

1. Hobbie, S.E., Finlay J.C. Janke, B., Nidzgorski, D.A. Dylan B. Millet D.B., and Baker, L.A. Contrasting nitrogen and phosphorus dynamics in urban watersheds: implications for urban water pollution. Submitted to PNAS November 2016.
2. Nidzgorski, D., S. Hobbie, L. Baker, C. Fissore, K. Nelson, J. McFadden, and J. King. Reduce, redirect, or recycle? Quantifying opportunities to increase household nutrient sustainability. In revision.
3. Miller, P., L. Baker and others. The Greening of Cities, from Research to Policy. In internal review.
4. Bael, D.L., J.S. Coggins, L. A. Baker, K.C. Nelson. Energy Poverty. In review at *Energy Policy*.
5. Kalinosky, P., L. Baker, S. Hobbie, R. Bintner. In prep. Quantifying nutrient removal during enhanced street sweeping. Target journal: *J. Environmental Engineering*.
6. Barnes, M., K.C. Nelson, L. Baker, S. Hobbie, J. King, and J. McFadden. In revision. Commute Choice: The influence of socio-demographic, psychological, and situational factors on driving behavior. *Environmental Psychology Journal*.
7. Qian, X.L., K.C. Nelson, L.A. Baker, S.E. Hobbie, J. King, and J. McFadden. In revision. C flux from household natural gas and electricity use: Assessing the effects of demographic factors, house characteristics, house thermal properties, and human behaviors
8. Peterson, H., L. Baker, J. Ulrich, J. Neiber, B. Wilson, and D. Bruening. In press. Using agricultural system phosphorus balances to improve the TMDL process Detailed P balance for the Albert Lea agricultural watershed: a tool for practical management. *Soil and Water Conservation*.
9. Baker, 2016 (in press). Urban drought resilience as a socio-ecological phenomenon. In:

*Situating Sustainability in an Unequal World*, edited by Julie Sze, NYU Press.

10. Mayer, B., L. Baker, T. Boyer, P. Dreshsel, M. Gifford, M. Hanjfra, P. Parameswaran, P. Westershoff, and B. Rittman. 2016. Total value of phosphorus recovery. *Env. Sci. Technol.*, DOI: 10.1021/acs.est.6b01239.
11. Chester, M. V., J. Sperling, E. Stokes, B. Allenby, K. Kockelman, C. Kennedy, L. Baker, J. Keirstead, and C. T. Hendrickson (2014), Positioning infrastructure and technologies for low-carbon urbanization, *Earth's Future* 2, 533–547, doi:10.1002/2014EF000253.
12. Romero-Lankao, P., K.R. Gurney, K.C. Seto, M. Chester, R.M. Duren, S. Hughes, L. R. Hutyra, P. Marcotullio, L.A. Baker, N. B. Grimm, C. Kennedy, E. Larson, S. Pincetl, D. Runfola, L. Sanchez, G. Shrestha, J. Feddema, A. Sarzynski, J. Sperling, and E. Stokes. 2014. A critical knowledge pathway to low-carbon, sustainable futures: Integrated understanding of urbanization, urban areas, and carbon, *Earth's Future* 2 515–532, doi:10.1002/2014EF000258.
13. Metson, G.S., D. M. Iwaniec, L.A. Baker, E.M. Bennett, D. L. Childers, D. Cordell, N.B. Grimm, M. Grove, D.A. Nidzgorski, S. White. 2015. Urban phosphorus sustainability: Systemically incorporating social, ecological, and technological factors into phosphorus flow analysis. *Env. Science and Policy* 47:1–11.
14. Kennedy, C., L. Baker, and H. Bratboe. 2014. Analyzing a city's metabolism, in *Elgar Companion to Sustainable Cities*, edited by D.A. Mazmanian and H. Blanco, Edward Elgar Publishing.
15. Martini, N.F., K.C. Nelson, S.E. Hobbie, and L.A. Baker. 2013. Why feed the lawn? Exploring the influences on residential turf grass fertilization in the Minneapolis-St. Paul Metropolitan Area. *Environment and Behavior*. DOI: 10.1177/0013916513492418.
16. Janke, B., J. Finlay, S. Hobbie, L. Baker, R. Sterner, D. Nidzgorski, and B. Wilson. 2013. Contrasting influences of stormflow and baseflow pathways on nitrogen and phosphorus export from an urban watershed. *Biogeochemistry*. DOI 10.1007/s10533-013-9926-1
17. Hobbie, S.E., L.A. Baker, C. Buyarski, D. Nidzgorski, J.C. Finlay. 2013. Decomposition of tree leaf litter on pavement: implications for urban water quality, *Urban Ecosystems*. DOI 10.1007/s11252-013-0329-9.
18. Baker, L. 2013. Hegemonic concepts and water governance from a scientific-engineering perspective, in *Critical Perspectives on Contemporary Water Governance: Scarcity, Privatization and Participation*, edited by L. Harris, J. Goldin, and C. Sneddon, Routledge.
19. Baker, L. and R. Newman. 2014. Managing the biological, economic, and social aspects of sustainable lake ecosystems, in *Water Quality and Sustainability*, in Volume 4, edited by J. Schoor of *Comprehensive Water Quality and Purification*, Dr Satinder Ahuja, editor-in-chief, Elsevier.

20. Fissore, C., J. McFadden, K. Nelson, E. Peters, S. Hobbie, J. King, L. Baker, and I. Jakobsdottir. 2012. Potential impacts of emerald ash borer invasion on biogeochemical and water cycling in residential landscapes across a metropolitan region. *Urban Ecosystems* 15:1015-1030.
21. Fissore, C., S.E. Hobbie, J.Y. King, J.P. McFadden, K.C. Nelson, L.A. Baker. 2012. The residential landscape: fluxes of elements and the role of household decisions. *Urban Ecosystems* 15: 1-18.
22. Baker, L. 2011. Can urban P conservation prevent the brown devolution? *Chemosphere* 84: 779-784.
23. Hobbie, S.E., L.A. Baker, C. Fissore, J.Y. King, J.P. McFadden, and K.C. Nelson. 2011. Planetary stewardship begins at home. *Bulletin of the Ecological Society of America* 92:389-391.
24. McConnell, W., J. Millington, N. Reo, M. Alberti, H. Asbjornsen, L. Baker, N. Brozović, L. Drinkwater, S. Drzyzga, J. Fragoso, D. Holland, C. Jantz, T. Kohler, H. Maschner, M. Monticino, G. Podestá, R. Gilmore Pontius, Jr., C. Redman, D. Sailor, G. Urquhart, and J. Liu. 2011. Research on Coupled Human and Natural Systems (CHANS): Approach. *Bull. Ecol. Soc. America* April 2011: 218-228.
25. Fissore, C., L. Baker, S. Hobbie, J. King, J. McFadden, K. Nelson, I. Jakobsdottir. 2011. Carbon, nitrogen, and phosphorus fluxes in households in the Minneapolis-St. Paul, Minnesota urban region. *Ecological Applications* 21(3): 619-639.
26. Baker, L. 2009. New directions in management of urban pollution, in *The Water Environment of Cities*, edited by L. Baker, Springer Science, Lowell, MA.
27. Baker, L., B. Wilson, D. Fulton and B. Horgan. 2008. Disproportionality as a framework to target nutrient reduction from urban landscapes (invited paper). *Cities and the Environment* 1(2): Article 7.
28. Baker, L.A. 2007. Symposium: Effect of human choice on characteristics of urban ecosystems. *Bulletin of the Ecological Society of America* 88(4): 404-409.
29. Kaye, J., A. Majumdar, C. Gries, A. Buyantuyev, N. Grimm, D. Hope, D. Zhu, W. Jenerette and L. Baker. 2008. Hierarchical Bayesian scaling of soil properties across urban, agricultural and desert ecosystems. *Ecological Applications* 18:132-145.
30. Baker, L.A., J. Schussler and S. Snyder. 2008. Drivers of changes in lake clarity. *J. Lake and Reservoir Management* 24: 30-40.
31. Baker, L. A. and P.L. Brezonik. 2007. Using whole-system mass balances to craft novel approaches for pollution reduction: examples at scales from households to urban regions, in *Cities of the Future: Towards Integrated Sustainable Water and Landscape Management*, edited by V. Novotny and P. Brown, IWA Publishing, London.
32. Schussler, J., L. Baker and H. Chester-Jones. 2007. Whole watershed P balances as a tool for lake management. *Ecological Engineering* 29:294-304.
33. Savanick, S., L.A. Baker, J. Perry. 2007. Nitrogen budget of the University of Minnesota, Twin Cities Campus. *Urban Ecosystems* 10: 119-137

34. Xu, Y., L. Baker, and P. Johnson. 2007. Effect of land use changes on temporal trends in groundwater nitrate concentrations in and around Phoenix, Arizona, *Ground Water* 27(2): 49-56.
35. Baker, L.A., P. Hartzheim, S. Hobbie, K. Nelson, J. King. 2007. Influence of consumption choices on C, N and P fluxes through households. *Urban Ecosystems* 10:97-117.
36. Kaye, J., P. Groffman, N. Grimm, L. Baker, and R. Pouyat. 2006. A distinct urban biogeochemistry? *Trends in Research in Ecology and Evolution* 4: 192-199.
37. Baker, L.A., P. Westerhoff, M. Sommerfeld. 2006. An adaptive management strategy using multiple barriers to control tastes and odors. *J. American Water Works Association* 98 (6): 113-126.
38. Westerhoff, P., L. Baker, M. Sommerfeld. 2005. Degradation of algal metabolites (2-methylisoborneol and geosmin) in semi-arid region reservoirs. *Water Research* 39:4899-4912.
39. Hope, D., W. Zhu, C. Gries, J. Oleson, J. Kaye, N. B. Grimm, L. Baker. 2005. Spatial variation in soil inorganic nitrogen across an arid urban ecosystem, *Urban Ecosystems* 8: 251-273.
40. Nguyen, M.L., P. Westerhoff, L.A. Baker, M. Esparza-Soto, Q. Hu, M. Sommerfeld. 2005. Characteristics and reactivity of algae-produced dissolved organic carbon. *J. Env. Engineering*, 131:1574-1582.
41. Baker, L.A., T. Brazel, and P. Westerhoff. 2004. Environmental consequences of rapid urbanization in warm, arid lands: case study of Phoenix, Arizona (USA), in *The Sustainable City III*, edited by N. Marchettini, C. Brebbia, E. Tiezzi, and L.C. Wadhwa, Advances in Architecture Series, WIT Press, Boston.
42. Mash, H., M.L. Nguyen, P.K. Westerhoff, L.A. Baker, and R. Neiman. 2004. Dissolved organic matter in Arizona reservoirs: end member analysis, *Organic Geochemistry* 35:831-843.
43. Hu, Q., M. Sommerfeld, L.A. Baker, and P. Westerhoff. 2003. Canal wall brushing - a control measure for taste and odor problems in drinking water supplies in arid environments. *J. Water Supply: Research and Technology - Aqua* 52:8: 545-554.
44. Baker, L.A., T. Brazel, N. Selovar, C. Martin, F. Steiner, N. McIntyre, A. Nelson, L. Musacchio. 2002. Urbanization and warming of Phoenix (Arizona, USA): Impacts, Feedbacks, and Mitigation. *Urban Ecosystems* 6: 183-203.
45. Nyguen, My Lin, L. Baker, and P. Westerhoff. 2002. Sources of DOC and DBP precursors in western U.S. watersheds and reservoirs. *J. Am. Water Works Assoc.* 94(5): 98-112.
46. Baker, L.A., D. Hope, Y. Xu, Lisa Lauver, J. Edmonds. 2001a. Nitrogen mass balance for the Central Arizona-Phoenix ecosystem. *Ecosystems* 4(6): 582-602.
47. Baker, L.A., D. Hope, Y. Xu, and J. Edmonds. 2001b. Multicompartment ecosystem nitrogen balances as a tool to understand and manage biogeochemical cycles in human ecosystems. *TheScienceWorld*, Proc. Second International Nitrogen Conference (N2001), Potomac, MD, October 14-18, 2001.
48. Grimm, N.B., L.A. Baker, and D. Hope. 2001. An ecosystem approach to understanding cities: familiar foundations and uncharted frontiers, in *Understanding Urban*



- Ecosystems: A New Frontier for Science and Education*, edited by A.R. Berkowitz, C.H. Nilon, and K.S. Hollweg, Springer-Verlag, pp. 94-114.
49. Gerke, S., L. Baker, Y. Xu. 2001. Sequential model of nitrogen transformations in a treatment wetland receiving lagoon effluent. *Water Research* 35 (16): 3857-3866.
  50. Urban, N.R., C.J. Sampson, P.L. Brezonik, and L.A. Baker. 2001. Sulfur cycling in the water column of Little Rock Lake, Wisconsin. *Biogeochem.* 52: 41-77.
  51. Baker, L.A., and P. Westerhoff. 2000. Chapter 6: Low-tech system to treat and reuse wastewater on the U.S.-Mexican border. In: Westerhoff, P. (ed.). *Water Issues on the U.S.-Mexico Border*, San Diego: San Diego State University Press.
  52. Whitmer, S., and L. Baker. 2000. Loss of bromide in a wetland tracer experiment. *J. Environmental Quality* 29: 2042-2045.
  53. Lauver, L., and L. Baker. 2000. Mass balance for wastewater nitrogen in the Central Arizona-Phoenix ecosystem. *Water Research* 34: 2754-2760
  54. Pinney, M., P. Westerhoff, L. Baker. 2000. Transformations of dissolved organic carbon through constructed wetlands. *Water Research* 34: 1897-1911.
  55. Farnsworth-Lee, L., and L.A. Baker. 2000. Conceptual model of aquatic plant decay and ammonia toxicity for shallow lakes. *J. Env. Eng. (ASCE)*, 126(3): 199-207.
  56. Johnson, J.S., L.A. Baker and P. Fox. 1999. Geochemical transformations during artificial recharge of groundwater: soil-water interactions of inorganic constituents. *Water Research* 33: 196-2006.
  57. Baker, L.A. 1998. Design considerations and applications for wetland treatment of high-nitrate waters. *Water Science Technology* 38: 389-395.
  58. Baker, L.A., Qureshi, T., and M. Wyman. 1998. Sources and mobility of arsenic in the Salt and Verde Rivers, Arizona. *Water Resources Research* 34(6): 1543-1552.
  59. Ingersoll, T. and L.A. Baker. 1998. Nitrate removal in wetland microcosms. *Water Research* 32: 766-684.
  60. Parks, S., and L.A. Baker. 1997. Sources and transport of organic carbon in an Arizona river-reservoir system. *Water Research* 31: 1751-1759.
  61. Baker, L.A. 1996. Lakes and Reservoirs, in *Handbook of Water Resources*, edited by L. Mays, McGraw-Hill Books.
  62. Urban, N.R., P.L. Brezonik, L.A. Baker, and L.A. Sherman. 1994. Sulfate reduction and diffusion in sediments of Little Rock Lake, Wisconsin. *Limnol. Oceanogr.* 39: 797-815.
  63. Sherman, L.A., L.A. Baker, P.L. Brezonik, and E.P. Weir. 1994. Sediment porewater dynamics of Little Rock Lake, Wisconsin: Geochemical processes and seasonal and spatial variability. *Limnol. Oceanogr.* 39: 1155-1171.
  64. Baker, L.A., D.E. Engstrom, and P.L. Brezonik. 1992. Recent sulfur enrichment in the sediments of Little Rock Lake, Wisconsin. *Limnol. Oceanogr.* 37: 689-702.
  65. Kaufmann, P.R., A.T. Herlihy, and L.A. Baker. 1992. Sources of acidity in lakes and streams of the United States. *Environmental Pollution* 77: 115-122.

66. Baker, L.A. 1992. Introduction to nonpoint source pollution in the United States and prospects for wetland use. *Ecological Engineering* 1: 1-26.
67. Baker, L.A., A. Herlihy, and P. Kaufmann. 1991a. Acidic lakes and streams in the United States: role of acidic deposition. *Science* 252: 1151-1154. Also, Baker et al., Reply to Krug and Warnick, *Science* 253: 1334-1335.
68. Baker, L.A. J.M. Eilers, R.B. Cook, P.R. Kaufmann, and A.T. Herlihy. 1991b. Interregional comparison of surface water chemistry and biogeochemical processes, in *Acidic Deposition and Aquatic Ecosystems*, edited by Don Charles, Springer-Verlag, New York, pp. 567-613.
69. Baker, L.A. 1991. Ion enrichment calculations. Appendix A in *Acidic Deposition and Aquatic Ecosystems*, edited by Don Charles, Springer-Verlag, New York, pp. 641-644.
70. Baker, L.A. 1991. Regional estimates of dry deposition. Appendix B in *Acidic Deposition and Aquatic Ecosystems*, edited by Don Charles, Springer-Verlag, New York, pp. 645-652
71. Baker, L.A., and E. Swain. 1990. Lake management in Minnesota. *Lake and Reservoir Management* 5: 1-10.
72. Webster, K., A.D. Newell, L.A. Baker, and P.L. Brezonik. 1990. Climatically induced rapid acidification of a softwater seepage lake. *Nature*: 347: 374-376. *This paper was awarded "Best Journal Publication", Corvallis Environmental Research Laboratory, Third Quarter, 1990.*
73. Baker, L.A., N.R. Urban, and P.L. Brezonik. 1989. Sulfur cycling in Little Rock Lake, in *Biogenic Sulfur in the Environment*, edited by W. J. Cooper and E. S. Saltzman, ACS Symposium Series 393, American Chemical Society, Washington, D.C., pp. 79-100.
74. Urban, N.R., and L.A. Baker. 1989. Alkalinity generation associated with the formation of ester sulfates. *Limnol. Oceanogr.* 34: 1144-1146.
75. Baker, L.A., and P.L. Brezonik. 1988a. Dynamic model of in-lake alkalinity generation. *Water Resources Research* 24: 65-74.
76. Baker, L.A., C.D. Pollman, and J.M. Eilers. 1988b. Alkalinity regulation in Florida softwater lakes. *Water Resources Research* 24: 1069-1082.
77. Baker, L.A. and P.L. Brezonik. 1988c. Reply to "Comment on dynamic model of internal alkalinity generation" by Rudd et al., *Water Resources Research* 24: 1828-1830.
78. Baker, L.A., J. Tacconi, and P.L. Brezonik. 1988d. Role of sedimentation in regulating major ion composition of softwater lakes. *Verh. Internat. Verein. Limnol.* 23: 346-350.
79. Brezonik, P.L., L.A. Baker, and T.E. Perry. 1987. Mechanisms of alkalinity generation in acid-sensitive softwater lakes, in *Sources and Fates of Aquatic Pollutants*, edited by Hites, R. A., and S.J. Eisenreich, Advances in Chemistry Series #216, American Chemical Society, Washington, pp. 229-260.
80. Baker, L.A., and P.L. Brezonik. 1985. Sulfate mass balance for a small, acidic lake, in *Planetary Ecology*, edited by D.E. Caldwell, J.A. Brierley, and C.L. Brierley, Van Nostrand Reinhold Co., pp. 297-306.
81. Baker, L.A., P.L. Brezonik, and E.S. Edgerton. 1986a. Sources and sinks of ions in a softwater, acidic lake. *Water Resources Res.* 22: 715-722.

82. Baker, L.A., P.L. Brezonik, and C.D. Pollman. 1986b. Model of internal alkalinity generation in softwater lakes: sulfate component. *Water, Air, Soil Pollution* 30: 89-94.
83. Brezonik, P.L., L.A. Baker, J. Eaton, T. Frost, P. Garrison, T. Kratz, J. Magnuson, J. Perry, W. Rose, B. Shepard, W. Swenson, C. Watras, and K. Webster. 1986. Experimental acidification of Little Rock Lake, Wisconsin. *Water, Air, Soil Poll.* 30: 115-122.
84. Baker, L.A., P.L. Brezonik, E.S. Edgerton, and R.W. Ogburn, III. 1985. Sediment acid neutralization in softwater lakes. *Water, Air, Soil, Poll.* 25: 215-230

#### **BOOK REVIEWS AND COMMENTARIES**

85. Baker, L. 2013. Review of *Metabolism of the Anthroposphere: Analysis, Evaluation, Design* by Peter Baccini and Paul H. Brunner. *J. Industrial Ecology (Special issue on Urban Sustainable Systems)* 16: 964.
86. Kennedy, C., L. Baker, S. Dhakal, A. Ramaswami. (2013). Sustainable urban systems - an integrated approach. *Journal of Industrial Ecology (Special Issue on Sustainable Urban Systems)* 16: 775-779.
87. Zborel, T., B. Holland, G. Thomas, L. Baker, K. Calhoun, A. Ramaswami. 2013. Translating research to policy for sustainable cities: what works and what doesn't. . *Journal of Industrial Ecology (Special Issue on Sustainable Urban Systems)* 16: 786-788.
88. Baker, L. Perils and pleasures of multidisciplinary research. 2006. *Urban Ecosystems* 9: 45-47.

#### **TRANSLATIONAL RESEARCH/RESEARCH SUPPORT TOOLS**

89. Baker, L., P. Kalinosky, S. Hobbie, R. Bintner. 2014. *Users Manual: Quantifying Removal Of Solids And Nutrients In Street Sweeping* (with spreadsheet planning tool for municipalities). MPCA/EPA 319 project outcome.
90. Baker, L., H. Peterson, J. Hill, J. Nieber, B. Wilson. 2014. *Users Manual: New Tools To Support TMDL Project Implementation* (with spreadsheet tool for developing watershed P balances). MPCA/EPA 319 project outcome.
91. Wein, S.P., K.C. Nelson, L. Baker, S. Hobbie, J. King, J. McFadden, C. Fissore, I. Jakobsdottir, D. Nidzgorski, and D. Burk. 2010. *Nitrogen And Phosphorus Fluxes In Household Landscapes: What Behaviors Affect These Fluxes And What Are A Few Underlying Homeowner Attitudes About These Behaviors?* Watershed District and Water Management Organization Report, Twin Cities Household Ecosystem Project, University of Minnesota.
92. Nelson, K.C, S. Grayzeck, J. King, S. Hobbie, L. Baker, and J. P. McFadden. 2008. *Our Household Choices in Urban Living Survey* (household survey tool), University of Minnesota, St. Paul.
93. Fissore, C., L. Baker, S. Hobbie, J. King, J. McFadden, K. Nelson. Household Flux Calculator (spread sheet and documentation). Supplemental information for Fissore et al. *Frontiers* article.

94. Sommerfeld, M., Westerhoff, P., and L. Baker. 2002. *Guidance Manual for Reducing MIB and Geosmin in Water Supplies in the Phoenix Metropolitan Area*. City of Phoenix, July 2002. ~60 pp.

#### **POLICY-RELATED SCIENCE ASSESSMENT REPORTS**

95. Minnesota Pollution Control Agency. *Minnesota's Nutrient Reduction Strategy*, 2013. Role: member, Agricultural Focus Group.
96. Citizens League Water Policy Team. 2009. *To the Source: Moving Minnesota's Water Management Upstream*. Citizens League of Minnesota, St. Paul. Role: Project prooper and committee member.
97. ACERP 1995 (Chair, Human Health Subcommittee). *Human Health: Part 4 of the Final Report of the Arizona Comparative Environmental Risk Project*. Human Health Committee of the Arizona Comparative Risk Project (Governor's appointees), Arizona Department of Environmental Quality. 215 pp.
98. NAPAP. 1991. *1990 Integrated Assessment: Report to Congress*. Role "Primary Technical Contributor" to the Aquatic Assessment section. NAPAP Integrated Task Group for the U.S. Congress. NAPAP, 722 Jackson Place, Washington, D.C.
99. Baker, L.A., P.R. Kaufmann, A.T. Herlihy, and J.M. Eilers. 1990. *Current Acid-Base Status of Surface Waters. State-of-Science Report #9*, National Acid Precipitation Assessment Program, 722 Jackson Place, Washington, DC. 367 pp.

#### **OTHER ARCHIEVED REPORTS AND MANUALS**

100. Baker, L.A., J. Coggins, D. Bael, and K. Nelson. [Drivers of Household Energy Conservation in Minnesota Using Data from the Twin Cities](#). Nov. 2014.
101. Baker, L. ("champion"). Sustainable waters. *The Sustainable Community at UMore Park*. UMore Development, March 2012.
102. Several chapters for *Assessment of Stormwater Best Management Practices*, 2008. Edited by J. Gulliver and J. Anderson, University of Minnesota Water Resources Center: (Baker, L., B. Wilson, J. Gulliver, O. Moshiri, A.J. Erickson and R. Hozalsky. Chapter 2: Stormwater Processes; Baker, L. and B. Ashelon. Chapter 6: Analysis of Soils and Water; Baker, L., R. Hozalksi, and J. Gulliver. Chapter 7: Source Reduction; Nieber, J., A.J. Erickson, L. Baker, and J. Gulliver and R. Hozalsky. Chapter 9: Infiltration Practices.
103. Thompson, K., W. Christofferson, D. Robinette, J. Curl, L. Baker, J. Brereton, K. Reich 2005. *Characterizing and Managing Salinity Loadings in Reclaimed Water Systems*, American Water Works Association Research Foundation, Project #2744, Denver, CO.
104. Westerhoff, P., M. Sommerfeld, and L. Baker. 2002. *Reducing Taste and Odor and Other Algae-Related Problems for Surface Water Supplies in Arid Environments*. Final Report to the City of Phoenix, July 2002. 300+ pp.

105. Baker, L.A., P.L. Brezonik, and C. Kratzer. Nutrient loading-trophic state relationships for Florida Lakes. 1981. Publication #56, Florida Water Resources Center, University of Florida, Gainesville.

#### **FULL-LENGTH CONFERENCE PAPERS**

About 20, available upon request.

#### **ARTICLES FOR PROFESSIONAL (PRACTITIONER) AUDIENCES**

1. Baker, L., P. Kalinosky, S. Hobbie, and R. Neprash. Street sweeping for effective nutrient removal. *Public Works Magazine*, August 2015.
2. Baker, L., P. Kalinosky, S. Hobbie, R. Bintner, and C. Buyarski. Quantifying nutrient removal by enhanced street sweeping, *Stormwater Magazine*, Feb/March 2014.
3. Kalinosky, P., L. Baker, S. Hobbie, R. Bintner. March 2013. Quantifying Nutrient Removal through Targeted Intensive Street Sweeping. *Stormwater Updates*, <http://stormwater.safl.umn.edu/updates-march-2013>.
4. Holway, J., and L. Baker. Principles for managing the Southwest's urban water environments. *Southwest Hydrology Magazine*, December 2009.
5. Baker, L. Urban stormwater: getting at the source (Feature article). 2007. *Stormwater Magazine* 8(8) Nov. 2007.
6. Baker, L. A. and J. Schussler. Whole-watershed P balances for lake management. *LakeLine*, June 2007.

#### **ARTICLES FOR PUBLIC AUDIENCES**

1. Baker, L. 2016. Opportunities and Barriers for Food Waste Reduction. What's working section, *Huffington Post*, July 15, 2016 at [http://www.huffingtonpost.com/lawrence-a-baker/opportunities-and-barrier\\_b\\_10996496.html](http://www.huffingtonpost.com/lawrence-a-baker/opportunities-and-barrier_b_10996496.html)
2. Baker, L. Support your local NIMBY. *Minneapolis Star Tribune*, Feb. 9, 2011.
3. Baker, L. He says it's not a golden egg. *ECM Post Review*, March 24, 2010.
4. Baker, with FSR Board. Friends of the Sunrise River on proposed power plant. *Chisago County Press*, 2009.
5. Baker, L. Sustaining our environment and our democracy. *Minnesota Journal*, July/August, 2009.
6. Baker, L. Minnesota's water environment in the 21<sup>st</sup> Century, *Minnesota Journal*, May 2008.
7. Baker, L. The trouble with road salt, *Minneapolis Star and Tribune*, May 22, 2008.
8. Baker, L. Enemy of the lake. "With Water in Mind" feature, *Minneapolis Star and Tribune*, January 27, 2008
9. Baker, L. What goes in upriver – must come down [on urban ecosystems]. "With Water in Mind" column, *Minneapolis Star and Tribune*, June 24, 2007.

10. Baker, L. Instant runoff [on source reduction for stormwater]. "With Water in Mind" column, *Minneapolis Star and Tribune*, April 15, 2007.

## **PRESS COVERAGE**

My research and ideas have been covered by *New York Times*, *U.S. News and World Report*, *Discovery News*, Arizona Public TV, National Public Radio, the *Minneapolis Star and Tribune*, and other outlets.

## **CONFERENCES AND WORKSHOPS**

### **CONFERENCE AND WORKSHOP LEADERSHIP (since 2000)**

- Waste Not: Closing the Loop on Organics Wastes (organizer). Conference held at the Earl Brown Center, University of Minnesota, June 2, 2015.
- Preparing Minnesota for Climate Change: A Conference on Climate Adaptation (planning committee), Nov. 7, 2013, University of Minnesota.
- RCN - SEES: Sustainable Cities - People and the Energy-Climate-Water Nexus (co-PI); first workshop held at YMCA of the Rockies, Estes Park, CO, August 16-19, 2012.
- Twin Cities Urban Sustainability Forum (PI, co-organizer), symposium at the University of Minnesota, Nov. 2-3, 2011 (tclusforum.umn.edu).
- Urban Ecosystems and Human Well-Being: Integrating Social and Ecological Knowledge (PI, lead organizer), symposium held at the University of Minnesota. Jan. 25, 2010.
- The Water Environment of Cities (PI, organizer), NSF-funded workshop held at Oswego, MN, January 2008.
- Organizer, Symposium "Effect of Human Choices on Characteristics of Urban Ecosystems", Ecological Society of America Conference, San Jose, CA, August 10, 2007.
- Urban Aquatic Systems (co-organizer with Bob Sterner), organized oral session held at the Am. Soc. Limnol. Oceanogr. Conference, San Juan, Puerto Rico, January 2011.
- Effect of Human Choices on Characteristics of Urban Ecosystems (lead organizer), symposium at the Ecological Society of America Conference, San Jose, CA, August 10, 2007.
- Integration of Biogeochemical Studies across LTER Sites (lead organizer), workshop held at the LTER All-Scientist meeting, Snowbird, UT, 2001.

### **INVITED PARTICIPATION IN NATIONAL/INTERNATIONAL WORKSHOPS AND PANELS (since 2000)**

1. Workshop on Water Equity and Resilience in Southern Africa, Stellenbosch Institute for Advanced Studies, Stellenbosch, South Africa, August 24-26, 2016.
2. Review of EPA's Safe and Sustainable Water Research Plan for 2016-2019 by the Safe and Sustainable Water Resources Subcommittee, Board of Scientific Counselors, Cincinnati EPA Lab, August 27-28, 2015.
3. WaTERS (Water Training, Education, and Research) workshop, April 1-3, 2015, ICGC,

University of Minnesota.

4. NSF-RCN workshops on P Sustainability, Tempe, January 6-10, 2014; Washington, D.C., May 18-22, 2015; and in Tempe, Arizona, January 18-21, 2016
5. NSF-RCN Workshop on Urban Sustainability, Tempe, April 2014.
6. Workshop on Human-Carbon Interactions in Urban Systems at NCAR, Boulder, CO, October 16-18, 2013.
7. Urban Climate Institute (RCN-SEES), first annual workshop held at the Science Museum of Minnesota, St. Paul, July 31-August 1, 2013.
8. Regional Approaches to Urban Sustainability: A Focus on Portland, National Academy of Sciences and Portland State, held in Portland, OR, May 28-29, 2013.
9. Coordinating Phosphorus Research to Create a Sustainable Food System (RCN-SEES), Year 1 workshop in Washington, DC, May 13-17, 2013.
10. Urban Sustainability Research Coordination Network (RCN-SEES) - Fluxes and Flows workshop, Tempe, Arizona, March 14-15, 2013 and March 10-12, 2014.
11. Greening of Cities - International Research Workshop, NSF-sponsored workshop held in Auckland, New Zealand, Dec. 10-13, 2012.
12. Building Knowledge Bridges, Workshop with the Minnesota Pollution Control Agency and University of Minnesota environmental scholars, August 27, 2012.
13. Urban Futures Workshop, UNESCO, Paris, June 25-26, 2012.
14. Panel on Human Dimension and Complex Urban Systems, Workshop on Sustainable Urban Systems, at the 2011 Int. Soc. Industrial Ecology Conference, Berkeley, June 6, 2011.
15. Planning for Water (speaker and panelist), short course and national webinar, American Planning Assoc. 2011 National Planning Conference, Boston, April 11-12.
16. Infrastructure Sustainability, Resilience, and Robustness, NSF Resilient and Sustainable Infrastructure Network (RESIN) Program) Workshop, Tucson, AZ, January 13-14, 2011.
17. Water Circle Workshop, Interdisciplinary Center for the Study of Global Change (ICGC), University of Minnesota, Nov. 13-14, 2010.
18. Urban Metabolism Workshop, MIT, Boston, January 12-13, 2010.
19. Biocomplexity in the Environment, NSF workshop, Alexandria, VA, March 21-23, 2005.
20. Integrating Social Science into LTER Programs: Ecosystem Function in Coupled Systems April 29-May 1, 2002, Baltimore, MD.
21. Integrating Education in Biocomplexity Research. National Academy of Sciences, Washington, DC, April 14-15, 2002.
22. Integration of Biogeochemical Studies across LTER Sites (workshop leader), 2001.

**INVITED CONFERENCE PRESENTATIONS (since 2000, about 40 total).**

1. Baker, L., S. Hobbie, J. Finlay, P. Kalinosky, and B. Janke. Moving upstream to reduce urban stormwater phosphorus loading (invited abstract), Session on Water, Energy and Society in Urban Systems, organized by D. Jenerette, J. Loperfido, A. Watts and C. Welty, Dec. 9, 2013 AGU meeting, San Francisco.

2. Baker, L. Envisioning resilient futures for urban water and wastes, Symposium “Past, Present, and Future Design of Infrastructures for a Resilient Society”, organized by T. Carter, E. Ellis and A. Felson for the 2013 Conference of the Ecological Society of America, St. Paul, MN, August 3-9, 2013.
3. Baker, L. Rethinking nutrient management in cities. International Low Impact Development (LID) Symposium, St. Paul, MN, August 18-21, 2013.
4. Baker, L. Can biogeochemists help to enhance urban resilience? American Geophysical Union, Symposium on Urban Biogeochemistry organized by S. Sushal, Dec. 2012.
5. Baker, L. The water environment of urban ecosystems: from theory to the street. Minnesota Association of Landscape Architects Annual Education Conference, St. Paul, April 20, 2012.
6. Baker, L. Role of landowner decisions on phosphorus movement to waterways. Midwest. 72<sup>nd</sup> Midwest Fish and Wildlife Conference, Des Moines, Dec. 2-3, 2011.
7. Baker, L. Analysis of energy, carbon, and nutrients through 1,800 households in the Twin Cities. Am. Inst. Chemical Eng. Conference, Minneapolis, Nov. 2011.
8. Baker, L. Insights on waste management from studies of urban ecosystems: case study of urban phosphorus. Conference on Urban Metabolism of Organics and Nutrients, StopWaste.org, Alameda, CA, Oct. 6, 2011.
9. Hobbie, S., L. Baker, K. Nelson and others. Twin Cities Household Ecosystem Project. 2011 Conference of the Ecological Society of America.
10. Baker, L. Water and material balances for urban systems: implications for landscape design. Ecological Landscaping: Local Self-Reliance and Resilience in Cities, sponsored by Ohio State U's Urban Landscape Program, Cleveland, OH, Dec. 1-3, 2009.
11. Baker, L., K. Nelson, J. McFadden, Jennifer King, and S. Hobbie. Twin Cities Household Ecosystem Project. Symposium on Complexity in Human-Nature Interactions across Landscapes, US-IALE Conference, Snow Bird, Utah, April 12-16, 2009.
12. Baker, L. (“featured speaker”). Understanding the role of human choice on urban ecosystems. Conference on Ecological Landscaping: From Scientific Principles to Public Practices and Policies, Cleveland, OH, October 28-31, 2007.
13. Nelson, K., L. Baker, P. Hartzheim, S. Hobbie, J. King and M. Payton. The influence of choice on nutrient fluxes through households and what influences choice. Symposium on the Role of Choice on Characteristics of Urban Ecosystems, Ecological Society of America, San Jose, CA, August 5-10, 2007.
14. Baker, L. and P. Brezonik. Biogeochemical cycles in cities. Cities of the Future, the Wingspread Workshop. NSF and others, Resort, Racine, WI, July 12-14, 2006.
15. Grimm, N.B., J.W. Edmonds, D. Hope, P. Westerhoff, and L. Baker. Understanding the response of southwestern rivers to urbanization using long-term records of conservative and reactive constituents. North Am. Benthological Society, Anchorage, AK, June 2006.



16. Baker, L., and S. Wolf. Sources of salt to municipal wastewater. 29<sup>th</sup> Annual Conference, Water Quality Association, Los Vegas, NV, March 18-22, 2003.
17. Baker, L. Nutrient cycling in coupled urban-agricultural systems. Workshop on the Science of Nutrient Cycling in Coupled Systems, College of Agriculture, Food and Environmental Sciences, U. of Minnesota, Sept. 23, 2002.
18. Baker, L. and W. Stefanov. Information engineering: a new paradigm for environmental management in the 21<sup>st</sup> century. Minnesota Water Conference, University of Minnesota, April 17-19, 2002.
19. Baker, L. An ecosystem-level approach for engineering the biogeochemical cycles of cities and farms. Keynote Talk, Midwest Water Chemistry Conference, University of Minnesota, Oct. 6-7, 2001.
20. Panel on salinity management, AZ Water Pollution Control Association Annual Conf., May 2-5, 2001.
21. Baker, L., D. Hope, N. Grimm, C. Martin, J. Briggs, and J. Klopateck. Carbon cycling in the Central Arizona-Phoenix ecosystem. Advances in Ecosystem Carbon Inventory, Measurement, and Monitoring, 2000, USDA Forest Service, Raleigh, NC, Oct. 3-5, 2000.

**CONTRIBUTED CONFERENCE TALKS (select examples since 2000; total ~ 60 national + 35 regional conferences)**

1. Peterson, H., L. Baker, J. Ulrich, J. Nieber, B. Wilson. Quantifying the upstream flux of phosphorus to Minnesota's Twin Cities urban food-shed, CHANS Fellow presentation at the Ecological Society of America Conference, August 7, 2013.
2. Hobbie, S., J. Finlay, L. Baker, B. Janke, P. Kalinosky, M. Bauer, J. O'Neil-Dunne, D. Nidzgorski, C. Buyarksi . The role of trees in mediating land-water nutrient flows in urban landscapes. Ecological Society of America Conference, August 7, 2013.
3. Bael, D., J. Coggins, L. Baker, K. Nelson. Energy poverty economics. Association of Environmental and Resource Economists, June 6-8, 2013, Banff, Alberta, Canada.
4. Kalinosky, P., L. Baker, S. Hobbie. Quantification of nutrient removal by street sweeping: the Prior Lake Street Sweeping Project. International Low Impact Development (LID) Symposium, St. Paul, MN, August 8-13, 2013.
5. Peterson, H., L. Baker. Analysis of Phosphorus Flows through Minnesota's Twin Cities Urban Food-Shed: Three Scenarios for Improving Nutrient Efficiency (poster), American Geophysical Union Conference, San Francisco, Dec. 2012.
6. Peterson, H. L. Baker, J. Ulrich, J. Nieber. Whole-watershed phosphorus balance as practical tool to achieve TMDL goals. Minnesota Water Resources Conference, Oct. 16-17, 2012.
7. Kalinoski, K., L. Baker, S. Hobbie. Quantifying nutrient load reductions through targeted, intensive street sweeping - a field study by the University of Minnesota in partnership with the City of Prior Lake, Minnesota Water Resources Conference, October 16-17, 2012.

8. Janke, B. J. Finlay, S. Hobbie, L. Baker. Importance of hydrologic pathways to urban nutrient loading and implications for current stormwater management practices, Minnesota Water Resources Conference, October 16-17, 2012.
9. Baker, L. Research to build resilience of cities to drought: three hypotheses. Conference of the European Society for Ecological Economics, Special session "Water struggles: right to water, justice, and changing hydro-social worlds", Istanbul, Turkey, June 2011 (presented via Skype due to family illness).
10. Baker, L. Applications of mass flow analysis for urban ecosystems. 6<sup>th</sup> Conference of the International Society for Industrial Ecology, Berkeley, CA, June 2011.
11. Baker, L., S. Hobbie, D. Nigorski, C. Fissore, S. Panzer, J. King, J. McFadden, K. Nelson. Movement of P through urban ecosystems. Am. Society of Limnology and Oceanography, San Juan Puerto Rico, Feb. 2011.
12. Fissore, C., L. Baker, S. Hobbie, J. King, J. McFadden, K. Nelson, and I. Jakobsdottir. How human activities affect macroelement fluxes at the household level: A study of 3100 households. 94<sup>th</sup> Annual Ecological Society of America Meeting, Albuquerque, August 2-7, 2009.
13. Baker, L.A., J. Walker, L. Byrne and A. Felson. Role of choice on characteristics of urban ecosystems (lead talk for symposium with same title), Ecological Society of America, San Jose, CA, August 5-10, 2007.
14. Hartzheim, P., L. Baker, S. Hobbie, K. Nelson, J. King, and M. Payton. Effect of consumption choices on fluxes of carbon, nitrogen and phosphorus through urban households: case studies from Minnesota and Albania. Ecological Society of American, Memphis, August 6-9, 2006.
15. Schussler, J., and L. Baker. Whole-watershed P balances for 11 Minnesota recreational lakes. North American Lake Management Society Conference, Nov. 9-11, 2005.
16. Baker, L., and J. Schussler. Limitations to the P retention paradigm. North American Lake Management Society Conference, Nov. 9-11, 2005.
17. Baker, L.A., P.L. Brezonik, D. Mulla, L. Stuewe, and L. Olmanson. Nitrogen cycling in urban and agricultural watersheds in Minnesota. 3<sup>rd</sup> International Nitrogen Conference, Nanjing, China, October 12-16, 2004.
18. Westerhoff, P., Gill, H. Mash, and L. Baker. Characterization of organic carbon from watersheds after forest fires. Presented at the American Water Works Association Conference, June 13-17, 2004, Orlando.
19. Baker, L.A., D. Hope, Y. Xu, J. Edmonds, and L. Lauer. Nitrogen balance for the CAP ecosystem: implications for managing the biogeochemical cycles of cities. Second International Nitrogen Conference, October 14-18, 2001, Potomac, Maryland.
20. Baker, L.A., P. K. Westerhoff, D. Bruce, and M.-L. Nguyen, M. Sommerfeld, T. Dempster, H. Qiang and D. Lowry. A multibarrier management strategy to control tastes and odors in the Phoenix water supply. Water Quality Technology Conference (WQTC), Salt Lake City, Nov. 5-9, 2000.

21. Nguyen, M.L., P. Westerhoff, L.A. Baker, M.R. Sommerfeld. Production of DOC/DBP precursors from algal growth in arid region surface water supply. Water Quality Technology Conference (WQTC), Salt Lake City, Nov. 5-9, 2000.

### **RECENT ACADEMIC SEMINARS**

1. Waste not: closing the loop on organic wastes. Twin Cities Research Group, St. Paul, Sept. 9, 2015.
2. Water Week Panel Discussion (panelist), World Water Day, Human Rights Program, Humphrey School, University of Minnesota, March 27, 2014.
3. Nutrient management of urban ecosystems. University of St. Thomas, April 2014.
4. Toward metabolic sustainability for the 21<sup>st</sup> century city. LimnoTech, Inc., Jan. 23, 2012.
5. Urban ecosystems and human well-being: implications for global survivability. Earth Week "Sustainability Supper" speaker, U. of Minnesota at Crookston, April 20, 2011.
6. Urban ecosystems: balancing nature's services with urban demand. Yale University, October 28, 2010.
7. From Lake Mendota to urban ecosystems: contributions of Pat Brezonik (retirement symposium), University of Minnesota, Sept. 24, 2010.
8. The biogeochemistry of everyday life. Portland State University, Oct. 15, 2010.
9. Twin Cities Household Ecosystem Project. Arizona State University, School of Sustainability Engineering, May 4, 2010.
10. Reducing landscape sources of pollutants to urban runoff. Trent University, Canada, Jan. 13, 2010.
11. Integrating human behavior into a model of urban biogeochemistry. IGERT graduate student seminar, U of M, April 27, 2009.
12. Can household consumption be altered to improve urban ecosystems? Macalester College, March 26, 2009.
13. Twin Cities Household Ecosystem Project. School for Sustainability Engineering, Arizona State University, March 19, 2009.
14. Phosphorus cycling in cities and farms: Are we headed for a brown devolution? Water Resources Science seminar, U of M, Feb. 2, 2009.

### **PROFESSIONAL TALKS OUTSIDE ACADEMIA (past 10 years)**

1. Removal of nutrients by street sweeping. Several variations presented at the following venues: Roadway Maintenance Training and Demo Day, Center for Transportation Studies, May 15, 2015; Shingle Creek Watershed District, May 14, 2015; Minnesota Street Superintendents Association, City of Prior Lake, Feb. 10, 2015; Minnesota Pollution Control Agency (videoconference), April 10, 2014; Minnehaha Creek Watershed District Board Meeting, March 27, 2014; Washington County Water Consortium, Nov. 6, 2013.

2. Spreadsheet calculator for calculating watershed P balances (with Heidi Peterson). Demonstration workshop, Buffalo, MN (Wright Co.), July 25, 2014; to be repeated at MCPA, August 25, 2014.
3. Watershed P balances as a tool for TMDL planning. Videoconference at the Minnesota Pollution Control Agency, April 24, 2014.
4. Baker, L., and H. Peterson. P dynamics for the Albert Lea Lake watershed: implications for future P management. Drainage Management Team Meeting, MPCA/BWSR, Jan. 16, 2014.
5. Quantifying Nutrient Load Recovery through Targeted, Intensive Street Sweeping . Kalinosky, P., L. Baker, S. Hobbie, C. Buyarski, R. Bintner. Stormwater U Workshops, Nov. 12 and Nov. 27, 2013. Materials posted at *Stormwater U*, <http://www.extension.umn.edu/environment/stormwater/pastNov13.html>
6. Baker, L., and H. Peterson. Toward a circular economy for P: connecting the Twin Cities to its farm support system, Washington County Water Consortium, Nov. 11, 2013.
7. Flowpaths of nutrients through urban ecosystems. Presented at a TMDL stakeholders meeting, Minnesota Pollution Control Agency, May 3, 2012.
8. Baker, L. H. Peterson, J. Nieber, B. Wilson, N. Moore, J. Ulrich. Phosphorus And Water Balance Tools For TMDL Plans: The Albert Lea Watershed Project, Manure Discussion Group, Feb. 3, 2012.
9. Twin Cities Household Ecosystems Project: Carbon footprints and beyond. MN chapter, American Planning Association, Dec. 18, 2008; also, Twin Cities Research Group Brown Bag, March 11, 2009.
10. Source reduction. Presented at three regional outreach workshops for the Minnesota Stormwater Assessment Project throughout spring 2007.
11. Source reduction for urban stormwater management. Public Works Forum, Ramsey-Washington Watershed District, Dec. 21, 2006.

## **TEACHING PROFILE**

### **COURSES TAUGHT (since 1992)**

#### University of Minnesota

Ways of Knowing, ICGC Ph.D. Fellows Seminar (2013), Freshman Seminar: Living Sustainably in Urban Ecosystems (2010 and 2011), Water Resources: Individuals and Institutions (WRS 5101/CE 5581), 2004-2009 (6).

#### Arizona State

Environmental Chemistry Lab (5), Topics in Environmental Chemistry (3), Water Quality Modeling and Assessment (3), Introduction to Environmental Engineering (9), Water Quality Management (1), Environmental Chemistry II (2)

### **GRADUATE STUDENT AND POST-DOC SUPERVISION**

15 M.S., 2 Ph.D.s started at ASU (both finished after I left).  
One post-doc (Heidi Peterson).

### **E-LEARNING**

Module on “Biophysical Aspects of Water Resilience”, with four submodules, part of an online training program for our International WaTERS project.

### **CONTRIBUTIONS TO INFORMAL EDUCATION**

- Science Buzz, “What is your flux score?” at <http://www.sciencebuzz.org/nutrient-flux> Interactive, web-based learning module developed in collaboration with the Science Museum of Minnesota.
- “Your Household Ecosystem” (video). Developed with the Bell Museum’s Sustainable Shelters exhibit (2010), <http://www.youtube.com/watch?v=kZgL7DmMM4A&feature=related>

### **EDUCATION SERVICE**

- Faculty Mentor, Humphrey School Public Policy Program, 2010 and 2011.
- Co-organizer, Urban Ecosystems Brown Bag Seminar (U of M), 2008-2009.
- Faculty Advisor, Water Resources Students in Action (U of M), 2003-2006.
- Water Resources Science Program (U of M) Executive Committee, 2004-2007
- WRS Seminar Committee, 2002-2007.
- Faculty Advisor (student-elected), Chi Epsilon Honor Society (ASU), 1995-1997.
- Faculty advisor for undergraduate research (Honors College Research; Coalition to Increase Minority Students; Women in Science and Engineering), all at ASU.
- Performance Review Team, Center for Environmental Studies, 1997.
- ASU Committees: Computers and High Technology in the Classroom Committee, 1995; College of Engineering Chemistry Liaison Committee (chair) 1994-1995; CEE Personnel Committee, 1994; CEE Research Committee, 1994-1995; five CEE Faculty Search Committees; CEE Curriculum Committee, 1997.

### **GUEST LECTURES**

In recent years I have presented guest lectures in the following departments and programs at the U of M (often in multiple classes): Bioproducts and Biosystems Engineering (as e-lecture); Ecology, Evolution and Behavior; School of Design; Forest Resources, Landscape Architecture; Environmental Science, Policy, and Management; Dept. Soil, Water, and Climate; Civil Engineering; Fisheries, and Wildlife, and Conservation Biology; also in the Environmental Studies Program at Macalester College and the Social Work Program at Augsburg College.

## **PUBLIC ENGAGEMENT**

### **CITIZEN GROUPS**

**Citizen's League of Minnesota:** Water Policy Study Committee, 2008-2009; Policy Committee (2005-2006), Principles and Standards Committee (2006), Facts Unfiltered Committee for the *Minnesota Journal* (2006) and occasional contributor to the *Minnesota Journal*.

**Friends of the Sunrise River:** Chairman of the Board 2008-2011; conducted extensive research to fight proposed natural gas powerplant (see "public workshops", below). Our effort was successful, and the site is now being developed for a solar power plant.

### **PUBLIC TALKS AND WORKSHOPS (10 years)**

1. Twin Cities Household Ecosystem Project: From Theory to the Street. Shoreview Environmental Quality Commission Speaker Series, March 21, 2012.
2. Flowpaths of nutrients through urban ecosystems. Presented at a TMDL stakeholders meeting, Minnesota Pollution Control Agency, May 3, 2012.
3. Twin Cities Household Ecosystem Project (with Sarah Hobbie and Kristen Nelson), Café Scientifique, Bryant Bowl, Jan. 18, 2011.
4. Chisago County's Ground Water Resources: What Do We Know? Organized for Friends of the Sunrise River, June 2, 2009.
5. Informational Workshop on the Proposed Sunrise River Energy Station, Organized for Friends of the Sunrise River, 2009.
6. Planning for C emissions inventory. City Council of Golden Valley, MN, March 2009.
7. Future of Minnesota's waters. St. Luke's Church, Minnetonka, April 27, 2008.
8. Role of personal consumption in Minnesota's energy situation. Chisago County Audubon Society, April 14, 2008.
9. Water policy workshop. Organized for a Citizens League "Policy Forum", Feb. 2008.
10. "Action Forum" panelist, Augsburg College's Focus the Nation workshop, January 2008.
11. Reflections on an "issues convention" on energy, presented at DFL District 51 Convention, April 5, 2008.
12. Baker, L. Environmental policy and planning (plenary talk). First Conference on Minnesota Sustainable Tourism, University of Minnesota, April 19-20, 2006.
13. Toolkit to inform local lake management policy. Presented at the North-Central Minnesota Lake Stakeholders meeting, August 2006.
14. The Future of Minnesota's Environment (panelist), "Policy and a Pint" Series, Minnesota Citizens League event, Varsity Theater, Minneapolis, April 20, 2006.