

KATHLEEN ANN LOHSE

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EDUCATION

- 1995-2002 University of California, Berkeley
Ph.D. Soil Science
Dissertation Title: *Hydrological and Biogeochemical Controls on Nitrogen Losses from Tropical Forests: Responses to Anthropogenic Nitrogen Additions*
Examination Fields: ecosystem ecology, landscape ecology, soil development, soil microbiology, and geomorphology
- 1988-1993 Cornell University
B.S. Urban and Regional Studies
B.A. Biology, *cum laude*
Honors Thesis Title: *The Effects of an Extreme Drought on the Vegetation of a Single Lava Flow on Mauna Loa, Hawaii* (Advisors: Drs. Robert Howarth and Peter Vitousek (Stanford University))

RESEARCH EXPERIENCE

- 2007-present Assistant Professor, School of Natural Resources, University of Arizona
2005-2006 Postdoctoral research associate, *Arizona State University*, Dr. Nancy Grimm
2003-2004 Postdoctoral fellow, *University of California, Berkeley*, Dr. Adina Merenlender
1996-2002 Graduate Student Researcher, *University of California, Berkeley*, Dr. Pamela Matson
1994-1995 Research Technician, *Cornell University*, Dr. Lars Hedin
1993-1994 Research Technician, *Michigan State University*, Dr. G. Philip Robertson
1992 REU Summer Field Assistant, *Stanford University*, Dr. Peter Vitousek

TEACHING EXPERIENCE

- Fall 2008 Instructor, Soil and Watershed Biogeochemistry, WSM 696a, seminar
Spring 2008 Instructor, *Watershed and Ecosystem Functions*, WSM 456/556, UA
Spring 2008 Guest Lecturer, *Wildland Water Quality*, WSM 468/568, UA
Fall 2007-8 Instructor, *Water Quality and the Environment*, UNVR 195a, UA
Spring 2007 Guest Lecturer, *Adv. Topics Merging Hydrology and Biogeochemistry*, HWR 696, UA
Spring 2005 Guest Lecturer, *Soil Ecology*, ASU
Spring 1996 Graduate Student Teaching Assistant, *Ecosystem Ecology*
Guest Lecturer, *Ecosystem Ecology*

RESEARCH INTERESTS

biogeochemistry, ecohydrology, nutrient cycling, ecosystem ecology, water quality, watershed science, integrated socio-ecological systems, sustainability science, soil science, vadose hydrology, global change

FELLOWSHIPS AND AWARDS

- Foreign Travel Grant Award, UA, 2008, \$1500
Athlete Hall of Fame, Menlo School, 2008 (induction)
EPA Star Postdoctoral Fellowship, University of California, Berkeley, 2003-2004

James P. Bennett Agricultural Fund Fellowship, University of California, 1999-2000, 2001
Carolyn Meek Memorial Scholarship, 2000-2001
Soil Science Fellowship, University of California, Berkeley, 1997-1998
NSF Pre-doctoral Fellowship Honorable Mention (1995)

PUBLICATIONS

- Lohse, K.A.**, D. Nullet, and P.M. Vitousek. 1995. The Effects of an Extreme Drought on the Vegetation of a Single Lava Flow on Mauna Loa, Hawaii. *Pacific Science*. 49:212-220.
- Matson, P.A., **K.A. Lohse**, and S.J. Hall. 2002. The globalization of nitrogen: consequences for terrestrial ecosystems. *Ambio*.3:113-119.
- Lohse, K.A.** and P.A. Matson. 2005. Consequences of nitrogen additions for soil processes and soil solution losses from wet tropical forests. *Ecological Applications*.15: 1629-1648.
- Lohse, K. A.**, and W. E. Dietrich. 2005. Contrasting effects of soil development on hydrological properties and flow paths. *Water Resources Research*. 41: W12419
doi:10.1029/2004WR003403.
- Opperman, J., **K.A. Lohse**, A. Merenlender, M. Kelly, and C. Brooks. 2005. Influence of watershed-scale land use on fine sediment in salmonid spawning gravels within the Russian River basin, California. *Canadian Journal of Fisheries and Aquatic Sciences*. 62:2740-2751, doi:10.1139/F05-187.
- Landridge, R., Christian-Smith, J., and **K.A. Lohse**. 2006. Access and Resilience: Analyzing the Construction of Social Resilience to the Stress of Water Scarcity in a Mediterranean-Climate Region. *Ecology and Society*. 11(2): 18. [online]
URL:<http://www.ecologyandsociety.org/vol11/iss2/art18/>
- Lohse, K.A.**, D. A. Newburn, J.J. Opperman, and A. M. Merenlender. 2008. Forecasting the relative impacts of land use on fine sediment in anadromous fish habitat to guide development and conservation programs. *Ecological Applications*. 18(2): 467-482
- Lohse, K.A.**, D. Hope, R.A. Sponseller, J.O. Allen, N.B. Grimm. 2008. Atmospheric deposition of nutrients across a desert city. *Science of the Total Environment* 402: 95-105.
- Lohse, K.A.**, P.D. Brooks, J. McIntosh, T. Meixner, and T. Huxman. In press. Interactions of Biogeochemistry and Hydrologic Systems. *Annual Review of Environment and Resources*
- Brooks, P.D. and **K.A. Lohse**. 2009. Water quality in the San Pedro River. In J. Stromberg and B. Tellman, editors. *Riparian Area Conservation and Ecology in a Semi-Arid Region: The San Pedro River Example*. Tucson, AZ: University of Arizona Press.
- Sanderman, J., **K.A. Lohse**, J. Baldock, R. Amundson. *In revision*. Linking soils and streams:

Sources and chemistry of dissolved organic carbon in a Mediterranean catchment. *Water Resources Research*

Lohse, K.A. and A.M. Merenlender. In revision. Impacts of exurban development on water quantity and quality. In *The Planner's Guide to Natural Resource Conservation: The Science of Land Development Beyond the Metropolitan Fringe*, edited by Adrian X. Esparza and Guy McPherson. New York, Springer.

In preparation

Lohse, K.A. Hydrogeology constrains the fate of anthropogenic nitrogen inputs in wet tropical forests.

K.A. Lohse, J. Sanderman, R. Amundson. Hydrologic controls on nitrogen and carbon transformations and loss pathways in a small Mediterranean catchment.

Gallo, E.L., P.D. Brooks, and **K.A. Lohse.** Spatial and temporal variability of water quality in storm runoff in a rapidly urbanizing desert Southwest

K.A. Lohse, P.D. Brooks, J.E.T. McLain, Role of wash substrate quality in modifying water quality in urbanizing watersheds in the semi-arid Southwest

GRANTS

Lohse, K.A., P. D. Brooks, J. McIntosh, T. Meixner. Tradeoffs between Enhanced Urban Storm Recharge and Water Quality: The Influence of Urban Housing Age and Density on Nutrients, Metals and Organic pollutants, TRIF WSP, \$97,527 (7/1/07-current)

Paul Brooks, Kathleen Lohse, Erika Gallo, Jen McIntosh, Tom Meixner, Gary Woodard. Evaluating the effects of climate and land use change on runoff and recharge with high resolution measurements of the quantity, chemistry, and isotopic signature of rainfall and runoff, TRIF-WSP Center Directed Funds, \$27,400 (7/1/07-7/1/08)

Lohse, K.A. Possible tradeoffs of Enhanced Urban Storm Recharge and Water Quality, University of Arizona, Agricultural Experiment Station Funds, \$6000, 7/1/07-9/31/12 (current)

Lohse, K.A. Influence of climate and increased variability of precipitation on coupled water, nutrient and carbon dynamics and losses. Institute for the Study of Planet Earth, Faculty Exploratory Research Grant and B2 EarthScience Match, \$20,000 (current).

Lohse, K.A., R. Lloyd, D. Falk. Effects of watershed restoration on ecohydrologic functions and resiliency to disturbance. NSF Ecosystems (pending).

SYNERGISTIC ACTIVITIES

Panel participant, N2001 conference, Woods Hole, MA; Water and Energy Forum, Oct 2007
NSF Panelist: IGERT, June 2007, Ecosystem Science Panel, Oct 2007, EPA Water Quality and Global Change Sept 2008.

Participant, Nitrate Stable Isotopes Workshop, USGS, Menlo Park 2002, CA;
Stable Isotope Course and Laboratory, University of Utah 1997,
RHESSys- 1 Day Modeling Course, *San Diego State University*, 2003;
Biosphere Hillslope Design, 2007-2008, CZO activities (UA)

Organizer, Central Arizona Phoenix All Scientist Meeting and Symposium (Jan 2006),

Presider, Ecological Society of America;

Student Poster Judge, ESA 2006, ISPE Fest 2007, AGU 2006; EDDA 2008

Convener AGU Symposium: Controls on Geochemical and Biogeochemical Processes in the Critical Zone)

Reviewer for Biogeochemistry, Ecological Applications, Oecologia, Biotropica, Journal of Environmental Management, Ecosystems, CRC Press, Soil Biology and Fertility

Member, American Geological Union, 1999-present, Ecological Society of America, 1995-present

INVITED PRESENTATIONS/SEMINARS

Lohse, K. 2008. An Integrated Watershed Approach to Sustaining Water Resources for Human and Natural Systems, Department of Agricultural and Biosystems Engineering, Feb 18, 2008.

Lohse, K. 2007. How does active storm water management influence runoff-recharge and water quality? Sustainability Forum Panelist, and Energy Nexus Issues. University of Arizona, October 25.

Lohse, K. 2007. Influence of hydrogeology on retention and loss of nitrogen from upland ecosystems. Soil, Water and Environmental Sciences, University of Arizona. Sept 10.

Lohse, K. 2006. Effects of soil development on hydrological properties and flow paths: consequences for nutrient losses. Department of Hydrology and Water Resources. University of Arizona. April 28.

Lohse, K. 2006. From the plot to the landscape: Scaling watershed hydrology and biogeochemistry. Department of Environmental Sciences. UC Riverside. April 10.

Lohse, K. 2006. Sustaining Water Resources for Human and Natural Systems: An Integrated Watershed Approach. University of Texas, Austin, Feb 28.

Lohse, K. 2006. Ecohydrologic Linkages: Using Hydrological Flow Paths to Scale Biogeochemical Processes. Department of Integrative Biology. University of Texas, Austin, Feb 23.

Lohse, K.A. 2005. Hydrological and biogeochemical controls on nitrogen transport and retention: responses to anthropogenic perturbations, Invited seminar in the Aquatic, Watershed, and Earth Resources Department, Utah State University. March 28.

Lohse, K.A. 2005. Towards Sustaining Water Resources and Aquatic Ecosystems: Forecasting Watershed Risks from Current and Future Land Use Change. Invited seminar in the Department of Landscape Architecture and Environmental Planning, February 28, 2005, UC Berkeley, CA.

Lohse, Kathleen. 2004. Globalization of N deposition: How will tropical forest ecosystems respond? Department of Environmental Science, Policy and Management Invited Seminar, March 8.

Lohse, Kathleen. 2004. Globalization of N deposition: How will tropical forest ecosystems respond? Invited research seminar in the Department of Renewable Resources at University of Wyoming, March 4.

Lohse, Kathleen 2004. Sustaining water resources for human and natural systems. Invited extension seminar in the Department of Renewable Resources at University of Wyoming. March 5.

Lohse, Kathleen. 2003. Hydrological and Biogeochemical Controls on Nitrogen Losses from Tropical Forests: Responses to Anthropogenic Nitrogen Additions. Invited Seminar talk at the University of California, Berkeley Biogeochemistry Series, April 28.

Lohse, Kathleen. 2003. Hydrological and Biogeochemical Controls on Nitrogen Losses from Tropical Forests: Responses to Anthropogenic Nitrogen Additions. Invited presentation for Stanford University Biogeochemistry Seminar Series. April 15.

SELECTED PRESENTATIONS AND POSTERS

K. Lohse, Snyder MA, Gallo EL, DeJwakh, NR, Brooks PD, McLain, McIntosh J, Meixner T. 2008. Best management practices of urban storm runoff: Investigating water quality of urban runoff with respect to channel type. Soil Water Conservation Society, July 29-31.

Gallo EL, Snyder MA, DeJwakh, NR, Lohse KA, Brooks PD, McLain, McIntosh J, Meixner T. 2008. Spatial and temporal patterns of summer monsoon storm runoff. Water Conservation Society, July 29-31.

K. Lohse, J. Sanderman, R. Amundson. 2008. Influence of hydrological flow paths on carbon and nitrogen transformations and loss pathways in a small Mediterranean catchment. European Geophysical Union, Vienna, Austria, April 13-18, 2008. Geophysical Research Abstracts, Vol.10, EGU2008-A-05846.

Gallo EL, Snyder MA, DeJwakh, NR, Lohse KA, Brooks PD, McLain, McIntosh J, Meixner T. 2007. Quantifying Land Use and Land Cover Effects on Urban Runoff Water Quality. Eos Trans. AGU, 88(52), Fall Meet. Suppl. Abstract H43D-1619. AGU, San Francisco, 12/13/2007.

Gallo, E.L.*, K. A. Lohse, P.D. Brooks. 2007. Land Use Impacts on Water Chemistry of Monsoonal Storm Runoff in the Tucson Basin. Water and Energy Forum (co-advise Gallo, *1st place Graduate Student Poster).

Gallo, E.L.*, M. Snyder*, N. DeJwakh*, K. A. Lohse, P.D. Brooks, J. McIntosh, T. Meixner. 2007. Land Use Impacts on Water Chemistry of Monsoonal Storm Runoff in the Tucson Basin. ISPE Fest. 1st place Graduate Student Poster (co-advise Gallo, *1st place Graduate Student Poster).

K.A. Lohse. Fluxes and fates of different forms of N in surface soils of wet tropical forests varying in nutrient status and substrate age in Hawaii. Ecological Society of America, San Jose, CA on 8/9/2007.

Merenlender, A., Lohse, K. A., Deitch, M., and Newburn, D. 2007. Quantifying and forecasting impacts of vineyard expansion on Mediterranean-climate watersheds to guide management and land conservation. Society of Conservation Biology.

Lohse, K.A., D. Hope, R.A. Sponseller, J.O. Allen. 2006. Spatial and temporal patterns of wet and dry deposition of nutrients in a desert city. ASM, Sept 20-24th. Estes Park, CO.

Lohse, K.A., D. Hope, R.A. Sponseller, and N.B. Grimm. 2006. Atmospheric deposition of nutrients in a desert city: Spatial patterns of wet deposition, throughfall, and runoff. *ESA*, Aug. 6-11.

Lohse, K.A., J. Sanderman, and R. Amundson. 2005. Influence of Hydrological Flow Paths on Rates and Forms of Nitrogen Losses from Mediterranean Watersheds. *Eos Trans. AGU*, 86 (52), Fall Meet. Suppl., Abstract H23D-1448 (poster).

Sanderman, J., K.A. Lohse, and R. Amundson. 2005. Linking Soils and Streams: Hydrological Controls on Organic and Inorganic Solute Transport in two Mediterranean Catchments. *Eos Trans. AGU*, 86 (52), Fall Meet. Suppl., Abstract H23D-1449 (poster).

Sanderman, J., K.A. Lohse, and R. Amundson. 2005. The Importance of Hydrologic Flow Path in Determining the Retention or Loss of Dissolved Solutes from Upland Ecosystems. NSF Sponsored Workshop: Frontiers in Exploration of the Critical Zone. University of Delaware – Newark, Delaware, October 24-26, 2005 (poster).

Lohse, K.A., D. Newburn, J.J. Opperman, C. Brooks, A. Merelender. 2005. Towards sustaining water resources and aquatic ecosystems: forecasting watershed risks to current and future land use change. *EOS Trans. AGU*, 86(18), Jt. Assem. Suppl, Abstract NB21F-01, May 23-27, New Orleans, LA.

Lohse, K.A. 2004. Consequences of nitrogen additions for base cation losses and aluminum mobility in tropical forests of contrasting soil age. *Ecological Society of America*. Aug 1-6, Portland, OR.

Lohse, K.A. 2003. Declines in soil pH due to anthropogenic nitrogen inputs alter buffering and exchange reactions in tropical forest soils. *American Geological Union*, Dec. 8-12, San Francisco, CA (poster).

Lohse, K.A and W.E. Dietrich. 2002. Hydrological properties and flow paths change with 4.1 million years of soil development. *American Geological Union*, Dec. 6-12, San Francisco, CA (poster).

Lohse, K.A. 2002. Effects of 4.1 million years of soil development on hydrological properties and flow paths in the Hawaiian Islands. *Ecological Society of America Meetings*, Aug. 4-10, Tucson, AZ.

Lohse, K.A. and P. Matson. 2001. Fate of ¹⁵N nitrate additions in Hawaiian wet tropical forest soils. *Ecological Society of America Meetings*, Aug. 5-10, Madison, WI.

Lohse, K.A. 2001. The Effects of Experimental Nitrogen Additions on Soil Solution Losses from Hawaiian Tropical Rain Forests of Different Nutrient Status: Patterns and Regulation. UC Berkeley graduate forum, Berkeley, CA.

Lohse, K.A., H. Farrington, J. Moen, P. A. Matson, and G. Asner. 2000. Relative importance of hydrological and biotic processes in regulating nitrate retention in wet tropical forests: comparisons using dual isotope tracers. *American Geological Union*, Dec. 15-19, San Francisco, CA.

Lohse, K.A., H. Farrington, J. Moen, P. A. Matson, and G. Asner. 2000. Interactions of soil hydrologic and biotic processes in regulating nitrate retention in wet tropical forests: comparisons using isotope tracers. Ecological Society of America Meetings, Aug. 5-10, Snowbird, Utah.

Lohse, K.A., P. A. Matson, and G.P. Asner. 1999. Effects of Experimental Nitrogen Additions on Nitrate Soil Solution Losses from Tropical Forests of Different Nutrient Status in the Hawaiian Islands. American Geological Union. Dec. 13-17. San Francisco, CA (poster).

Lohse, K.A., P. Matson, and J. Moen. 1999. Effects of Experimental Nitrogen Additions on Nitrate Leaching Losses from Hawaiian Tropical Forests of Different Fertility. Ecological Society of America Meetings, Aug. 8-12, Spokane, Washington.

Lohse, K.A. 1997. The role of vegetation change on soil/ ecosystem processes and their interaction with geomorphological processes. UC Berkeley graduate forum, Berkeley, CA.