
Gregory H. LeFevre

glefevre@stanford.edu
121 Yang & Yamazaki Environment & Energy Building
473 Via Ortega, Stanford University
Stanford, California 94305-4020

Education

Ph.D. Environmental (Civil) Engineering, UNIVERSITY OF MINNESOTA (U of M) Minneapolis
August 2012

M.S. Environmental (Civil) Engineering, UNIVERSITY OF MINNESOTA (U of M) Minneapolis
February 2009

B.S. Environmental Engineering, *summa cum laude*, MICHIGAN TECHNOLOGICAL UNIVERSITY (MTU) Houghton
December 2006
Minor: German language; Concentration: Engineering Enterprise

Research Statement

My research focuses on understanding the fundamental biological and chemical mechanisms of natural and enhanced remediation and best management practices to improve environmental quality. My current research investigates the efficacy of vegetative and microbial approaches in bioretention cells to capture and degrade contaminants from stormwater runoff.

Research Experience

POSTDOCTORAL RESEARCHER (Current):

STANFORD UNIVERSITY, Environmental Engineering and Sciences, Dept. of Civil & Environmental Eng.

- Researcher for NSF ERC ReNUWI: Re-inventing the Nation's Urban Water Infrastructure
- Advisor: Professor Richard G. Luthy
- Conduct research on stormwater pollutant fate, natural systems for beneficial stormwater use, vegetative uptake of emerging contaminants, optimizing bioretention practices for pollutant removal

GRADUATE RESEARCH FELLOW:

UNIVERSITY OF MINNESOTA, Dept. of Civil Engineering and BioTechnology Institute *Minneapolis, MN*

- Dissertation: "Fate and Biodegradation of Petroleum Hydrocarbons in Stormwater Bioretention Cells"
- Research Advisors: Professor Paige J. Novak and Professor Raymond M. Hozalski
- Advising Committee: John S. Gulliver, John L. Nieber, Timothy M. LaPara
- U.S. National Science Foundation Graduate Research Fellow
- NSF IGERT Trainee *Non-Equilibrium Dynamics Across Space and Time*
- University of Minnesota Graduate School Fellow
- Institute on the Environment Boreas Environmental Leadership Program

US-EUROPEAN COMMISSION SHORT COURSE ON ENVIRONMENTAL BIOTECHNOLOGY:

- "Microbial Catalysts for the Environment" *July 2011 University of Lausanne, Switzerland* (Prof. J. van der Meer)
- Competitively awarded (12 US participants) collaborative advanced training course in molecular methods

SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP:

Research Assistant for Prof. Brian Barkdoll, MTU Campus

- Created long-term simulation hydrologic models of four watersheds in HEC HMS to evaluate effects of global climate change on sediment transport

INTERNATIONAL FIELD RESEARCH:

- GEOPHYSICAL GROUNDWATER EXPLORATION *Boaco, Nicaragua*
- Aided in active geophysical field research seeking water bearing rock fractures (Prof. John Gierke)
- PROJECT PHIRI: Brown Hyena Research *Pilanesberg National Park, South Africa*
- Research directed by Dr. Dawn Scott and graduate students from University of Brighton (UK) studying predator / prey relationships and effects of human encroachment on habitat management
- GROUNDWATER of the RIO SONORA BASIN *Rio Sonora Basin, Mexico*
- Examined ground and surface water resources, environmental health, and wastewater issues in arid region through MTU Geological Engineering Dept. (Prof. Alex Mayer)

Refereed Journal Publications

- **LeFevre, G.H.**; Hozalski, R.M.; Novak, P.J. The role of biodegradation in limiting the accumulation of petroleum hydrocarbons in raingarden soils. (*Water Res.* **2012** In press. DOI: 10.1016/j.watres.2011.12.040).
- **LeFevre, G.H.**; Novak, P.J.; Hozalski, R.M. Fate of Naphthalene in Laboratory-Scale Bioretention Cells: Implications for Sustainable Stormwater Management. *Environ. Sci. Technol.* **2012**, *46*, 995-1002. DOI: 10.1021/es202266z.

Refereed Conference Proceedings

- **LeFevre, G.**, Novak, P., Hozalski, R. Quantification of petroleum hydrocarbon residual and biodegradation functional genes in rain garden field sites. *ASCE Conference Proceedings* **2010** (367) 1379-1386. DOI:10.1061/41099(367)118

Non-Refereed Conference Papers / Reports

- **LeFevre, G.**, Hozalski, R. Novak, P. Investigating stormwater hydrocarbon fate and biodegradation in bioretention areas. *Saint Anthony Falls Laboratory Stormwater UPDATES* newsletter, **2012** Vol 7, Iss. 3.
- **LeFevre, G.**, Hozalski, R. Novak, P. Bioretention: A sustainable approach to removing stormwater hydrocarbons and protecting groundwater. *Minn. Groundwater Association Newsletter*, **2012** Vol 31, No. 1.
- **LeFevre, G.**, Novak, P., Hozalski, R. Effect of vegetation on the fate of petroleum hydrocarbons in laboratory-scale raingardens. *Proceedings to EWRI/ASCE International LID Conference 2011* Philadelphia, PA.
- Weiss, P., **LeFevre, G.**, and Gulliver, J. Contamination of soil and groundwater due to stormwater infiltration practices: A literature review. University of Minnesota, St. Anthony Falls Laboratory Project Report No.515. Prepared for Minnesota Pollution Control Agency. Available June 23, **2008**.
- Hozalski, R., **LeFevre, G.**, Gulliver, J. Assessment of the stormwater infiltration and pollutant removal capacities of rain gardens. *Proceedings to EWRI/ASCE Thailand 2009: An International Perspective on Environmental and Water Resources*.
- Ward, A., Trahan, M., **LeFevre, G.**, Culberson, S., Krevinghaus, A. Hydrologic model of the Silver River watershed. Prepared for the Haestad Methods National Hydrologic Modeling Competition by Aqua Terra Tech Enterprise. First place award winner. Michigan Tech. Univ. **2005**

Oral Presentations and Invited Lectures

- **LeFevre, G.** (*Invited*). Fate and biodegradation of petroleum hydrocarbons in stormwater bioretention areas. US Geological Survey, Wisconsin Water Science Center, Madison, WI **2012**.
- **LeFevre, G.** (*Invited*). Petroleum hydrocarbons in stormwater bioretention areas. Minnesota Pollution Control Agency, St. Paul, MN **2012**.
- **LeFevre, G.** (*Invited*). Petroleum hydrocarbons in stormwater bioretention areas. US Geological Survey, Minnesota Water Science Center, Mounds View, MN **2012**.
- **LeFevre, G.**, Novak, P., Hozalski, R. Fate of petroleum hydrocarbons in stormwater bioretention areas. *Minnesota Water Resources Conference*, St. Paul, MN **2011**.
- **LeFevre, G.**, Novak, P., Hozalski, R. Effect of vegetation on the fate of petroleum hydrocarbons in laboratory-scale raingardens. *International Low Impact Development Symposium* Philadelphia, PA, **2011**.
- **LeFevre, G.**, Novak, P., Hozalski, R. Prevalence and biodegradation of stormwater petroleum hydrocarbons in raingarden bioretention areas. *25th Annual Conference on the Environment* **2010** (AWMA, WEF; Minneapolis, MN).

- **LeFevre, G.**, Novak, P., Hozalski, R. Quantification of petroleum hydrocarbon residual and biodegradation functional genes in rain garden field sites. *ASCE International Low Impact Development Conference*. San Francisco, CA, **2010**.
- Almer, C. and **LeFevre, G.** Impacts of stormwater infiltration on the groundwater system. *Minnesota Ground Water Association Conference*. St. Paul, MN, **2009**.
- **LeFevre, G.** Petrochemicals residual and bacterial degradation genes in raingardens. *University of Minnesota Department of Civil Engineering Environmental Engineering Seminar*. Minneapolis, MN, **2008**.

Poster Presentations

- **LeFevre, G.**, Novak, P., Hozalski, R. Fate of Naphthalene in Laboratory-Scale Bioretention Cells: Implications for Sustainable Stormwater Management. *US-EC Task Force in Environmental Biotechnology* Lausanne, Switzerland, **2011**.
- **LeFevre, G.**, Novak, P., Hozalski, R. Petroleum hydrocarbon residual and biodegradation genes in raingardens. *24th Annual Conference on the Environment: Water Environment Association, Air & Waste Management Association*. Minneapolis, MN, **2009**.
- **LeFevre, G.**, Novak, P., Hozalski, R. A field study to quantify petroleum hydrocarbon residual and biodegradation functional genes in rain gardens. *Land Conservation and Clean Water Summit*. Chaska, MN, **2009**.
- **LeFevre, G.**, Novak, P., Hozalski, R. Petrochemical runoff into raingarden soils—remediation or residuals? *23rd Annual Conference on the Environment: Water Environment Association, Air & Waste Management Association*. Minneapolis, MN, **2008**.

Research and Analytical Skills

- Reactor and Experimental Design (biodegradation kinetics, column and batch experiments, organic carbon characterization, hydroponic experiments)
- Genetic Molecular Methods / Microbiology (DNA, RNA, live cell extractions, qPCR, RT-PCR, agarose gels, plating, tRFLP, cloning)
- Chemical Analysis (GC-FID, HPLC, Liquid Scintillation, TOC, CE, GC-PID, GC-ECD)
- Data Analysis (Stata, SAS, GraphPad, Excel Solver and VBA Macros, Canoco)
- Computer Modeling (HEC-HMS, EPA NET, ARC GIS, H2O NET, SewerCad, ASIM, P8, SWAT, FLUX)

Selected Honors and Awards

- 2011 ARCS Foundation Fellowship (Achievement Reward for College Scientists 1 of 2 in MN)
- 2011 US-EC Course in Environmental Biotechnology (Selected Participant, 1 of 12 in US)
- 2011 Academic Excellence Award Central States Water Environment Association
- 2009 American Water Works (MN) Advanced Degree Scholarship
- 2007 NSF Graduate Research Fellowship
- 2007 NSF IGERT Traineeship
- 2007 U of M Graduate School Fellowship (1 of 60)
- 2006 World Wildlife Fund Fellow (1 of 16 in US)
- 2005 Morris K. Udall Scholar (U.S. Congressional Environmental Fellowship; 1 of 80 in US)
- 2005 Hasted Methods National Hydrologic Modeling Competition Scholarship
- MTU Civil & Environmental Engineering Department Scholarship Achievement Award
- American Groundwater Trust Scholarship
- MTU CEE Dept. Scholarship Achievement Award
- MTU CEE Dept. Learning Center Coaching Excellence Award
- American Garden Club conservation scholarship, Midwest regional and local winner
- Lake County Soil and Water Conservation District Scholarship
- American Groundwater Trust Scholarship
- Aldo Leopold Conservation Scholarship
- Volo Bog Conservation Scholarship
- Hawthorn Woods Volunteerism Scholarship
- Michigan Tech Academic Excellence Award 2003-2006
- Damoder & Reddy Alumni Award, Mayer Memorial, DeVieg Foundation, Rozsa, and VanCamp Endowments

Journal Peer Reviewer

- Environmental Science & Technology
- Journal of Hazardous Materials
- Journal of Environmental Engineering—ASCE
- Biodegradation
- Journal of Irrigation and Drainage Engineering—ASCE.

Proposals / Grants

- Minnesota Water Resources Center: *Enhanced degradation of stormwater petrochemicals within the rhizosphere of raingarden bioretention cells.* (Fully funded, 2008)
- Water Environment Research Foundation: Decentralized Systems. Pre-proposal 2007.
- National Science Foundation Graduate Research Fellowship Program proposal *Rhizobacteria Degradation of Stormwater Petrochemicals in Bioretention Systems.* (Fully funded, 2007)
- Michigan Space Grant Consortium *Rain Garden Studies for Increasing Participation of Underrepresented Students in Earth Sciences: A Collaboration of College (Mentors) and Pre-College (Protégés) Students.* (Fully funded, 2005)

Professional Experience

SEASONAL HYDROLOGIST: FRIENDS of the TETON RIVER *Driggs, ID*

- Conducted water quality (chemical & microbial) monitoring, erosion surveys, sediment surveys, fish electro-shocking
- Contracted by Idaho Department of Water Resources to monitor irrigation diversions and canals; fostered collaboration with irrigators
- Established stage-discharge relationships for gauging sites
- Researched seepage characteristics of gaining / losing stream segments
- Supervised summer intern

WATER QUALITY INTERN: WORLD WILDLIFE FUND, SE RIVERS & STREAMS PROJECT *Nashville, TN*

- Examined, wrote, and submitted formal comments to Tennessee Statewide Stormwater Pollution Prevention Plan with special emphasis on transportation planning and environmental mitigation
- Evaluated highway and construction site engineering plans/proposals/procedures for stormwater pollution impacts and impacts on benthic vertebrate organisms
- Conducted dam re-licensing impact evaluations
- Participated in Tennessee state environmental legislative agenda meetings

ENGINEER INTERN: INDIAN HEALTH SERVICE, OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING (U.S. Public Health Service) *Navajo Nation, Shiprock, NM*

- Researched and implemented arsenic removal adsorptive media pilot tests at multiple well sites
- Constructed hydraulic model of 80+ mile distribution system using H2O NET, including original design
- Designed preliminary sewer layout plan and lagoon revitalization in area of groundwater contamination
- Performed independent field work with various engineering instruments
- Participated in pre- and post-construction project meetings

INSTRUCTOR: MTU CIVIL & ENVIRONMENTAL ENG. DEPT LEARNING CENTER

- Instructed undergraduate students in water resources engineering, environmental engineering, and fluid mechanics in teams and individual help sessions
- Member of the Steering Committee to oversee successful operation of the learning center

ECOLOGICAL RESTORATION INTERN: CITIZENS FOR CONSERVATION, INC. *Barrington, IL*

- Performed field work in the ecological restoration of wetlands, prairies, savannas, woodlands
- Multi-year evaluation studies on wetland mitigation, streambank stabilization, invasive species management, macro-invertebrate water quality
- Supervised two to four summer interns
- Oversaw education of new interns and volunteer workdays, including high school work groups
- Discussed ecological management plans with board members
- Led and coordinated workdays of greater than 30 volunteers
- Created an interactive middle school education program

Society Membership

- American Society of Civil Engineers (ASCE), Environmental & Water Resources Institute (EWRI)
- Water Environment Federation
- American Water Works Association
- Air and Waste Management Association
- Society for Environmental Engineering (MTU Student President, Vice President)

Leadership and Service

- Leadership training through Boreas program
- Teaching training through Preparing Future Faculty program
- Habitat Restoration Volunteer Crew Leader, US National Park Service
- ASCE Undergraduate-Graduate Student Mentor
- Twin Cities Regional Science Fair judge
- Mentored undergraduate laboratory assistants
- Aqua Terra Tech Enterprise (President)
- Society of Environmental Engineers (President, VP)
- Environmental Leadership Summit (Washington, DC)
- CEE Learning Center Steering Committee

Certifications

- Engineer-in-Training (EIT) registration
- German Language: Goethe-Institut Zertifikat Deutsch
- Certified Illinois herbicide Applicator (supervisor) and Operator