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EDUCATION

- **Ph.D. in Engineering, Environmental Engineering Concentration** June 2007
  University of California, Irvine
  Dissertation: Occurrence of Bacterial Pollution in an Urban Watershed: From the Watershed to the Microcosm Scale
  Advisor: Dr. Stanley B. Grant
- **M.S. in Engineering, Environmental Engineering Concentration** March 2000
  University of California, Irvine
- **B.S. in Civil Engineering** December 1995
  University of Maryland at College Park

PROFESSIONAL REGISTRATION

Professional Civil Engineer (P.E.), California, #61042 2000 to present
40 hour HAZWOPER-certified according to 29 CFR 1910.120 1996

PROFESSIONAL HISTORY

- University of Mississippi, Assistant Professor 2007 to present
- University of California, Irvine, Doctoral Researcher 2003 to 2007
- University of California, Irvine, Extension Program, Instructor 2004 to 2007
- Geomatrix Consultants, Newport Beach, CA, Project Engineer 1996 to 2003
- Bonnard & Gardel Consulting Engineers, Lausanne, Switzerland, Intern Summer 1995
- Vista Chemical Company, Baltimore, MD, Intern Summer 1994
- Maryland State Highway Administration, Greenbelt, MD, Intern Summer 1993

RESEARCH EXPERIENCE

Principal Investigator
University of Mississippi
Use of Microcosm Studies to Determine Die-Off of Fecal Pollutants. July 2008 to present.
Determined the die-off rates of total coliform and *Escherichia coli* bacteria in lake and tributary waters in order to provide improved parameters for mathematical modeling of fecal pollution. Seven microcosms were monitored: (1) lake water, (2) lake water and sediment, (3) lake water and sterilized sediment, (4) sterilized lake water and sediment, (5) sterilized deionized water and sediment, (6) sterilized lake water, and (7) sterilized deionized water and sterilized sediment. *E. coli* decay rates were found to be lower when sediment was present.

Acoustically-Enhanced Soil and Groundwater Remediation. June 2008 to present.
Exposing bench-scale contaminated aquifer models to sources of acoustic energy and evaluating potential of acoustics to desorb contaminants from soil grains.

Characterization of Water Quality in Mississippi Reservoirs. August 2007 to present.
Conducting exploratory data analysis on historical water quality data in a large Mississippi reservoir. Determining trophic states of reservoir and assessing water quality impact from the rapidly urbanizing surrounding area.

Doctoral Researcher September 2003 to June 2007
University of California, Irvine
Microbial and Particle Pollution in Urban Stormwater. Conducted research on transport processes of bacteria, viruses, and suspended solids in stormwater. Managed staff of 20 students for intensive sample collection and analysis during storm events. Tracked weather patterns using National Weather Service radar data. Processed water samples for fecal indicator bacteria using Colilert and Enterolert tests. Coordinated with collaborators on obtaining virus data and particle size distribution of water samples.

Evaluation of Relationships between Microbial Populations and Suspended Particles in Urban Stormwater Runoff. Using data on microbial populations (acquired using terminal restriction fragment length polymorphism, TRFLP) and suspended particles to determine relationships between these parameters in stormwater samples. Evaluating effect of rainfall patterns on microbial populations and suspended particles. Using multivariate statistics and evaluating whether microbial sources can be tracked to different parts of the watershed based on TRFLP results. (TRFLP is a molecular fingerprinting method based on bacterial DNA extracted from a water sample.)

Microcosm Studies of Bacteria Growth in Treated Wastewater. Conducted sampling of treated wastewater and receiving water to develop laboratory microcosms. Monitored microcosms to evaluate potential of regrowth or recovery of fecal indicator bacteria in treated wastewater discharges in the presence of nutrient-laden base flow in receiving waters.

Modeling Studies on Stream Water Quality during Dry Weather. Conducted water quality modeling of Cucamonga Creek in southern California, where dry-weather discharge consists of treated wastewater discharges, agricultural runoff, and urban runoff. Modeled pollutant transport using the advection-dispersion-reaction equation and mass balance. Parameters modeled were fecal indicator bacteria, nutrients, and physical analytes in a 6-mile reach of the stream. Performed multivariate statistical analysis and correlated fecal indicator bacteria concentrations with nutrient levels in stream. Managed and oversaw field sampling events and laboratory sample analyses.

Coastal Water Quality Studies. Evaluated effect of river discharges to the coastal ocean water quality after storm events. Study took into account surfzone and offshore concentrations of fecal indicator bacteria and suspended particles, wave direction and magnitude, and satellite true color images. Collected coastal water quality samples for analysis of fecal indicator bacteria and

particle size distribution offshore from a boat and by foot at the edge of piers and bridges in southern California.

INDUSTRY EXPERIENCE

Project Engineer March 1996 to September 2003

Geomatrix Consultants, Inc. (now AMEC Geomatrix), Newport Beach, California

Soil and Groundwater Remediation. Designed pilot and full-scale soil and groundwater remediation systems, provided construction oversight, and managed operations and maintenance activities at numerous sites. Conducted hands-on work at remediation sites by troubleshooting equipment, pipefitting, and collecting samples. Calculated short- and long-term budgets, wrote feasibility studies, advised clients on decision-making. Prepared equipment lists and technical drawings as part of bid packages for contractors. Prepared application materials for treated water discharge permits. Prepared operation and maintenance manual and health and safety plans. Managed data and operations and maintenance of remediation systems, including compliance sampling. Technologies used included high-vacuum dual-phase extraction systems, groundwater extraction systems, in situ technologies, air sparging trenches, dewatering trenches, slurry walls, excavation.

Stormwater Characterization Study for California Department of Transportation (Caltrans). Selected appropriate rural highway monitoring sites for stormwater runoff that met requirements of representativeness, safety, instrumentability, and effectiveness of best management practices (BMPs). Designed channels and piping to convey stormwater runoff to appropriate location for sampling and flow measurement. Programmed automated stormwater sampling and flow measurement equipment. Tracked weather for storms to be monitored and assembled field teams to mobilize to monitoring sites and monitor storms. Troubleshot equipment and evaluated effectiveness of sampling program.

Environmental Due Diligence, several industrial facilities in Brazil (São Paulo, Salvador, Porto Alegre) and Mexico (Guadalajara, Queretaro, Veracruz). Performed environmental due diligence assessment for manufacturing facilities. Evaluated groundwater monitoring data, reviewed compliance records with regulatory agencies, and reviewed process wastewater treatment and solvent recycling systems. Managed subsurface investigations. Prepared reports of findings for stakeholders.

Business Development and Proposal Writing. Responded to request for proposals and wrote proposals for existing and potential clients for work on environmental remediation and due diligence. Presented at a proposal interview that resulted in company winning the contract. Prepared marketing materials that stated company's qualifications for work in Latin America. Developed budgets based on time and materials.

FUNDING

Department of Education. "U.S.-Brazil Consortium for Sustainable Drinking Water Studies." 2010-2014.

Council on International Educational Exchange and University of Mississippi Office of the Provost. Faculty Development Seminar "Peru: A Fusion of Identities" 2009.

Mississippi Water Resources Research Institute. "Monitoring and Modeling Water Pollution in Mississippi Lakes." 2008-2009.

University of Mississippi, Faculty Research Program. "Monitoring and Modeling Fecal Pollution in Sardis Lake." 2008-2009.

EPA Science to Achieve Results (STAR) Graduate Fellowship. 2005-2007.

PUBLICATIONS

Kinnaman, A.R., Surbeck, C.Q. (2010). Microcosm studies reveal that predation and organic carbon affect the fate of fecal indicator bacteria in surface water." Submitted to *Journal of Environmental Engineering – ASCE*.

Lim, K.Y., Wilson, S.E., Woolsey, E.E., Surbeck, C.Q. (2010). "Evaluation of a community-scale drinking water treatment system." Submitted to *International Journal for Service Learning in Engineering.*

Surbeck, C. Q., Jiang, S. C., and Grant, S. B. (2010). "Ecological control of fecal indicator bacteria in an urban stream." *Environ. Sci. Technol.*, 44(2), 631-637.

Surbeck, C. Q. (2009). "Factors influencing the challenges of modelling and treating fecal indicator bacteria in surface waters." *Ecohydrol.*, 2(4), 399-403.

McCuen, R. H., and Surbeck, C. Q. (2008). "An alternative to specious linearization of environmental models." *Water Research*, 42(15), 4033-4040.

Surbeck, C. Q., Jiang, S. C., Ahn, J. H., and Grant, S. B. (2006). "Flow fingerprinting fecal pollution and suspended solids in stormwater runoff from an urban coastal watershed." *Environ. Sci. Technol.*, 40(14), 4435-4441.

Ahn, J. H., Grant, S. B., Surbeck, C. Q., DiGiacomo, P., Nezlin, N., and Jiang, S. (2005). "Coastal water quality impact of stormwater runoff from an urban watershed in southern California." *Environ. Sci. Technol.*, 39(16), 5940-5953.

CONFERENCE PROCEEDINGS AND ABSTRACTS

Howie, W., Young, R., Plouffe, G., Surbeck, C.Q. (2010). "Providing clean water to communities in need: Living Waters for the World's sustainable clean water systems." *World Water and Environmental Congress*, American Society of Civil Engineers, Providence, RI.

Surbeck, C. Q., Jiang, S. C., Ahn, J. H., and Grant, S. B. (2010). "Fecal pollutants and suspended particles in wet weather discharges in a large urban river." *World Water and Environmental Congress*, American Society of Civil Engineers, Providence, RI.

Surbeck, C. Q. (2009). "Monitoring and statistical analysis of fecal indicator bacteria in Lower Sardis Lake, Mississippi." *Mississippi Water Resources Conference*, Mississippi Water Resources Research Institute, Tunica, MS.

Kinnaman, A., and Surbeck, C. Q. (2009). "The use of microcosm studies to determine the effect of sediments and nutrients on bacteria in lake water." *Mississippi Water Resources Conference*, Mississippi Water Resources Research Institute, Tunica, MS.

Surbeck, C. Q. (2008). "Occurrence of fecal indicators in surface waters and what they mean for water quality management." *50 Years of Soil and Water Research in a Changing Agricultural Environment*, USDA ARS National Sedimentation Laboratory, Oxford, Mississippi.

Gordji, L., and Surbeck, C. Q. (2008). "Movement of Water Pollutants in Sardis Lake." *38th Annual Mississippi Water Resources Conference*, Mississippi Water Resources Research Institute, Jackson, Mississippi, 88-96.

Surbeck, C.Q., Grant, S.B. (2007). "Regrowth of microbial pollution in an urban stream." Environmental and Water Resources Institute, *World Environmental and Water Resources Congress*, Tampa, Florida.

Surbeck, C. Q., Grant, S. B., Jiang, S., Ahn, J. H. (2006). "Fecal pollution and suspended particles in stormwater runoff from an urban coastal watershed." *American Chemical Society 40th Western Regional Meeting*, Orange, California.

Surbeck, C. Q., Grant, S. B., Ahn, J. H., Jiang, S. (2005). Storm water runoff from an urban watershed in southern Cailfornia: top-down approach for characterizing and modeling pollutant loading rates." Environmental and Water Resources Institute, *World Environmental and Water Resources Congress*, Anchorage, Alaska.

Surbeck, C. Q., Bianchi-Mosquera, G. (2004). "Practical considerations for successful implementation of environmental engineering projects in South America." *ASCE 2nd International Engineering and Construction Conference*, Fullerton, California.

Queiroz Surbeck, C., Kent, R., Hardcastle, C.H. (1999). Performance of the PADRE® A3100 Unit to Control Vapor Emissions from a Soil Vapor Extraction System." *Air & Waste Management Association Meeting*, St. Louis, Missouri.

INVITED PRESENTATIONS

"Monitoring and Statistical Analysis of Fecal Indicator Bacteria in Lower Sardis Lake, Mississippi." Adopt-A-Stream Workshop, John W. Kyle State Park, MS, June 15, 2010.

"Engineering for Disadvantaged Communities: An Update on Service Learning and Engineers Without Borders." With Wei-Yin Chen. North Mississippi ASCE Branch, Southaven, MS, June 1, 2010.

"Fecal Pollution and Particles in the Santa Ana River: What Do They Mean to Water Quality?" Women's Environmental Council Meeting, Irvine, CA, March 23, 2005.

"Environmental Regulations in Brazil" ABS Group Inc., Latin America: Environmental Regulations and Compliance Course, Washington, D.C. and Miami, FL, 2000, 2001, and 2002.

SERVICE

Associate Editor, Journal of Water Resources Planning and Management
June 2008 to June 2010

Member, Pathogens in Wet Weather Flow Task Committee May 2009 to present
Environmental and Water Resources Institute of the American Society of Civil Engineers

Co-Chair, Visiting International Fellowship Committee May 2006 to October 2009
Environmental and Water Resources Institute of the American Society of Civil Engineers

Chair, International Council October 2007 to October 2009
Vice-Chair, International Council October 2005 to October 2007
Secretary, International Council October 2003 to October 2005
Environmental and Water Resources Institute of the American Society of Civil Engineers

Journal Reviewer for:
International Journal for Service Learning in Engineering
ASCE Journal of Irrigation and Drainage Engineering
ASCE Journal of Water Resources Planning and Management
Environmental Science and Technology
Journal of the American Water Resources Association