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http://scholar.google.com/citations?hl=en&user=N2JiRuAAAAAJ&view_op=list_works

Rank and Department

Emeritus Cudworth Professor of Urban Water Systems, Department of Civil, Construction, and Environmental Engineering, University of Alabama

Education

Ph.D., Civil and Environmental Engineering, with major work in the areas of water resources, environmental chemistry and statistics, University of Wisconsin-Madison, WI, 1987

M.S.C.E., Environmental Engineering/Hydraulic Engineering, San Jose State University, CA, 1971

B.S. Engineering Science, Humboldt State University, Arcata, CA, 1970

Engineering Registrations

Professional Engineer, State of Wisconsin (No. 24044, 1984)

Board Certified Environmental Engineer, American Academy of Environmental Engineers (No. 93-20037, 1993)

Diplomate, American Academy of Water Resources Engineers (No. 00129, 2005)

Teaching, Research and Industrial Experience

Director, Environmental Institute, University of Alabama, Tuscaloosa, AL, 2004 – 2012.

Cudworth Professor of Urban Water Systems, Department of Civil, Construction, and Environmental Engineering, University of Alabama, Tuscaloosa, AL, 2002 – 2014.

Professor, Department of Civil, Construction, and Environmental Engineering, University of Alabama, Tuscaloosa, AL, 2001 – present.

Professor, Department of Civil and Environmental Engineering, with a secondary appointment in the Department of Environmental Health Sciences, University of Alabama at Birmingham, 1997- 2001.

Founding Director, Environmental Health Engineering Ph.D. program, University of Alabama at Birmingham, 1997– 2001.

Associate Professor, Department of Civil and Environmental Engineering, with a secondary appointment in the Department of Environmental Health Sciences, University of Alabama at Birmingham, 1993-1997.

Assistant Professor, Department of Civil and Environmental Engineering, with a secondary appointment in the Department of Environmental Health Sciences, University of Alabama at Birmingham, 1987-1993.

Environmental Engineer, Wisconsin Department of Natural Resources, Madison, WI, 1984-1987.

Consulting Environmental Engineer, Blue Mounds, WI, and Birmingham, AL, 1979-present.

Senior Engineer, Woodward-Clyde Consultants, San Francisco, CA, 1974-1979.

Environmental Engineer, URS Research Company, San Mateo, CA, 1971-1974.

Memberships in Professional Societies

American Society of Civil Engineers (ASCE), Member
Member, Urban Water Resources Research Council
Member, Water Resources Safety Committee
Member, Stormwater Pathogens Committee
Member, Low Impact Development Committee
Water Environment Federation (WEF), Member
Issue Area Team Member for WERF research
American Water Resources Association (AWRA), Member

Journal Reviewer

Journal of Water Resources Planning and Management (ASCE)
Journal of Environmental Engineering (ASCE)
Water Environment Research (WEF)
Water Research (IAWQ)
Water Resources Bulletin (AWRA)
Water Science and Technology (IAWQ)
Watershed Protection Techniques (Center for Watershed Protection)

Reviews for State and National Agencies

National Academy Press (National Research Council)
Auckland Regional Council (New Zealand)
Department of Ecology (Washington)
Wisconsin Water Resources Institute (University of Wisconsin)
Alabama Department of Environmental Management (Montgomery)
Computational Hydraulics Institute (Guelph, Ontario)
California Sea Grant Institutional Program (Univ. of Southern California)
Urban Waste Management and Research Center (Univ. of New Orleans)
Water Resources Division (Wisconsin Department of Natural Resources)
Baldwin County Public Works Department (Alabama)
Vermont Water Resources and Lake Studies Center (Univ. of Vermont)
Center of Environmental Research Information (U.S. Environmental Protection Agency)
Division of Water Quality (Minnesota Pollution Control Agency)
Watershed Evaluation Branch (U.S. Environmental Protection Agency)

Memberships on Professional Committees and Review Boards

National Research Council, National Academy of Science, *Committee on the On-Site Beneficial Use of Graywater and Stormwater: An Assessment of Risks, Costs, and Benefits*. 2013 – 2015.
Cumberland County Soil & Water Conservation District, Long Creek Watershed Expert Panel, Maine. 2014 – 2015.
Chesapeake Bay Partnership. *Illicit Discharge Elimination Expert Panel*. 2013 – 2014.
Seattle Public Utilities. *CSO Integrated Plan Expert Panel*. 2012 – 2013.
Colorado Nutrient Data Gap Analysis Committee. 2012 – 2014.
Auckland Regional Council. *Auckland TP-90 Gap Analysis Review Committee*. 2012 – 2013.
EnviroCert International, Inc., Board of Directors. 2010 – 2011.
Puget Sound Stormwater Work Group. Review panel member. 2009 – present.
Missouri Street Side Alternative Manual, Review panel member, 2009 – 2012.
The Birmingham Charter for Sustainability. Founding focus group member. 2009 – 2010.
Black Warrior River Keeper, Advisory Council, 2009 – present.
Electrical Power Research Institute (EPRI) and Water Environment Research Foundation (WERF). *Advisory Team for New Paradigm for Water Infrastructure Project*. 2009 – 2011.
Florida Department of Environmental Protection and the Center for Watershed Protection. *Review Team for Stormwater Design Criteria within the State of Florida*. 2009.
Missouri Dept. of Natural Resources. *Expert Panel on Integrating Water Quality into Municipal Storm Water Management (Street Side Alternatives)*. 2009 – 2013.
City of Tuscaloosa, AL. *Shelby Park Biofiltration Design*. 2009 – 2010.

Millburn, NJ and US EPA. *Evaluation of Cistern Infiltration Facilities and Groundwater Impacts*. 2008 – 2012.

Birmingham Southern College and ArchitectureWorks, Birmingham, AL. *Greywater Reuse and Beneficial Uses of Stormwater on a College Campus*. 2007.

Water Environment Research Foundation (WERF) and GeoSyntec Consultants. *Review of Monitoring Methods to Support the International Stormwater Best Management Practices Database*. 2008 – 2009.

California Regional Water Quality Control Board, Los Angeles Region. *Expert Panel for Santa Susana Field Laboratory Advanced Stormwater Controls*. 2008 – present.

California Department of Transportation (Caltrans) and RBF Consulting. *Technical Advisory/Review Assistance*. 2007 – present.

Monash University, Melbourne, Australia, Chair, *External Review Team for Facility for Advancing Water Biofiltration*. 2007.

Florida Stormwater Association, *Research Advisory Council*. 2007 – 2010.

University of New Hampshire, *Stormwater Center Technical Advisory Board*, 2007 – 2009.

National Research Council, National Academy of Science, *Committee on Reducing Stormwater Discharge Contributions to Water Pollution*. 2006 – 2009.

U.S. Environmental Protection Agency, Science Advisory Board, *Homeland Security Advisory Committee*. 2005 – 2007.

Auckland Regional Council, New Zealand, *Stormwater Projects Review Committee*. 2004 – 2007.

California Water Resources Board, *Setting Numeric Limits for Stormwater Discharges*. 2005 – 2006.

Framework Program for Global Health, University of Alabama at Birmingham and NIH, 2005 – 2006.

U.S. Environmental Protection Agency, National Risk Management Research Lab (NRMRL), *External Reviewer*, 2004.

State of Washington, Office of Salmon Recovery, *Independent Science Panel*, 2003 – 2004.

US EPA, *Experts Panel for the 2003 Report to Congress on Combined Sewer Overflows and Sanitary Sewer Overflows, Public Health Effects*. 2002 – 2003.

Water Environment Research Foundation, *Stormwater Advisory Board, Chairman*. 2001 – 2006.

American Society of Civil Engineers, *Urban Water Resources Research Council, Executive Committee Member*, 2001 – 2005.

Alabama Water Resources Research Institute, *Alabama Water Resources Council*. 2000 – 2001.

Urban Water Modeling Conference, Editorial committee member, 2000 – present.

National Council of Examiners for Engineering and Surveying (NCEES). Clemson, S.C. *Fundamentals of Engineering (FE) Examination Development Committee for Environmental Engineering Exam.* 1999 – 2001.

U.S. Environmental Protection Agency, Washington, D.C. and the American Society of Civil Engineers, Reston, VA. Peer review committee on *Development of Performance Measures, National Stormwater Best Management Practices (BMP) Database*. 1998 – 2003.

U.S. Environmental Protection Agency, Washington, D.C. *Urban Wet Weather Federal Advisory Subcommittee on Revision of Water Quality Standards*. 1997.

Construction Industry Research and Information Association (CIRIA), London, steering committee member, *Management of Gully Pots for Improved Runoff Quality*. 1997.

New York City, Department of Environmental Protection, member of *Technical Advisory Committee on Combined Sewer Overflow Program*. 1997 – 2000.

Center for Watershed Protection - Editorial Board Member. 1995 – 2003.

Watershed Management Institute, Inc., Member of Board of Directors. 1995 – 2001.

International Association on Water Quality (IAWQ), London, member of Scientific and Technical Report group preparing: *Solids in Sewers: Characteristics, Effects, and Controls of Sewer Solids and Associated Pollutants*. 1995 – 2003.

Univ. of New Orleans, *Urban Waste Management & Research Center*, affiliate member. 1994 – 2000.

Center for Watershed Protection, member of *Work Group on Stormwater Indicators*. 1995.

The Rensselaerville Institute, NY, committee on evaluating *Phase II U.S. EPA Stormwater Discharge Permit Requirements*. 1995.

Cleveland CSO Value Engineering Task Force, 1993.

U.S. EPA “SWAT” Team member for assisting states in determining Total Maximum Daily Loads (TMDL), 1992 – 1995.

U.S. EPA Task Force on Phase II of the Stormwater Permit Program, 1992 – 1994.

U.S. DOE EPSCoR Alabama State Director for Energy and the Environment, 1992 – 1994.

Resource Conservation and Development Council, Jefferson County, Soil and Water Conservation District, 1992 – 1994.
Committee on Class V Underground Injection Control-Stormwater NPDES, U.S. EPA Groundwater Protection Division, 1992.
Committee on Augmenting Natural Recharge of Groundwater with Reclaimed Wastewater, Stormwater, and Irrigation Return Flows. National Research Council, National Academy of Science, 1991 – 1994.
Alabama Erosion and Sediment Control Manual Development Committee, U.S. Department of Agriculture, Soil Conservation Service, 1991-1994.
Chairman, Cahaba River Work Group, Alabama Environmental Management Commission, 1990 – 1994.
U.S. EPA Planning Committee on Pollution Prevention Research, Risk Reduction Engineering Laboratory, 1990.

Conference Program Committees

Ecology of Cities. Russian Academy of Sciences and the General Physics Institute of the RAS, Ministry of Ecology of Greece, and the Ministry of Culture of Greece. Rhodes, Greece, June 1998.
Effects of Watershed Development and Management on Aquatic Ecosystems. Engineering Foundation and ASCE. Snowbird, Utah. August 1996.

Honors, Awards and Listings

California Stormwater Quality Association (CASQA). Most Outstanding Stormwater Control Implementation Project (Lower Lot Biofilter System). Awarded to Boeing and the Stormwater Quality Expert Panel. 2013.
Technology Merit Award for Business Achievement, *Environmental Business Journal*. (member of Hydro International, Ltd., team). 2005.
Haywards Fellow, Manaaki Whenua - Landcare Research, New Zealand, 2005.
Editors Award, *Journal of Environmental Engineering*, for “outstanding service to ASCE and to the profession.” 2004.
Distinguished Service Citation, School of Engineering, University of Wisconsin, 2002.
Listed in:
Marquis’ Who’s Who in the World (12th edition 1995, to current).
Marquis’ Who’s Who in America (51st edition 1997, to current).
Marquis’ Who’s Who in American Education (5th edition 1996 – 1997, to current).
Marquis’ Who’s Who in the South and Southwest (24th edition 1995 – 1996, to current).
Marquis’ Who’s Who in Science and Engineering (2nd edition 1994 – 1995, to current).
Marquis’ Who’s Who in Finance and Industry (30th edition, 1998 – 1999, to current).
Guest Lecture at University of Tel Aviv, Israel, 2001.
Outstanding Student Chapter for 1997, American Water Resources Association, faculty advisor.
Board of Visitors Faculty Award for Distinguished Achievement, 1995.
Guest Lectureship, Universität Gesamthochschule Essen, Germany, 1994.
Ellen Gregg Ingals/UAB National Alumni Award for quality of teaching, finalist for 1994.
Excellence in Teaching Award, UAB School of Engineering, 1994.
Water Environment Federation, first place national award for combined sewer project (member of New York City project team), 1992.
North American Lake Management Society, professional presentation award, 1992.
Take Pride in America, first place Alabama environmental volunteer award, 1991.
Award of Recognition, U.S. Department of Agriculture, 1990.
U.S. Soil Conservation Service Earth Team, first place national award, 1989.
General Electric Engineering Education Fellowship, 1984 – 1986.
Federal Water Pollution Control Administration Fellowship, 1970 – 1971.

Representative Experience

Dr. Pitt has been the project manager and principal investigator for many urban water resources research projects. He has worked on lake management projects, environmental research projects, hazardous material management plans, facility location studies, and environmental assessments. His major area of interest is in stormwater management, especially the integration of drainage and water quality objectives.

Dr. Pitt has conducted research for the U.S. EPA, Environment Canada, Ontario Ministry of the Environment, states, and local governments concerning the beneficial uses, effects, sources, and control of wet weather flows for more than 40 years. He was also been involved in a number of projects that have used this research information to develop management plans, stormwater ordinances, and design manuals. As an example, he was a member of the technical advisory group for the EPA's Nationwide Urban Runoff Program (NURP). He also prepared the Source Loading and Management Model (WinSLAMM) and developed the watershed analysis procedures to investigate urban runoff for the priority watershed program of the Wisconsin Department of Natural Resources. These procedures are still being used as the basis for state cost-sharing for major runoff control retro-fitting programs. He has also prepared manuals of practice which contain design procedures and construction specifications for stormwater and erosion control practices and has supervised their construction.

Dr. Pitt has also conducted research for the EPA to develop and test procedures to recognize and reduce inappropriate discharges of wastewaters to separate storm drainages. These procedures are being used by municipalities involved in the Clean Water Act's stormwater permit program as a field screening technique to identify and quantify discharge sources. He has also directed a series of EPA research projects to investigate the sources and control of stormwater toxicants. As an example, he has found that combinations of sedimentation, aeration, and photo-degradation can significantly reduce stormwater toxicity. Automobile service facilities have been identified as a significant toxic pollutant source and a specialized treatment system to be located at these sources has been designed and tested at several locations. He developed the Multi-Chambered Treatment Train (MCTT) for high level controls of stormwater toxicants at critical source areas, and also helped develop an upflow filter for high rate treatment in urban areas.

His research also examined stormwater effects on groundwater, and a book on this research was published by Ann Arbor Press. He has also evaluated the effects of separate sewage overflows on human health, especially considering toxic metal and organic pollutants and pathogens. Another EPA project directed by Dr. Pitt examined past drainage design procedures and recommends future approaches for drainage design. He has co-authored several books and numerous chapters based on this and related material, especially integrating stormwater modeling tools for water quality and drainage design objectives.

Other EPA – funded research included developing a nationwide database of national stormwater permit information and conducting comprehensive evaluations of this data. Recent research included investigating innovative heavy metal removal techniques for stormwater. He is currently investigating the sources and significance of stormwater bacteria and the transport and effects of stormwater gross solids. Other current projects examined the presence and treatability of emerging contaminants in wet weather flows, the scour of sediment from stormwater control devices, and the development of rapid analysis methods for the detection of organic contaminants in sediments and water using laser spectrographic techniques. Pitt and his graduate students are also conducting research on integrating green infrastructure controls in areas having combined sewers; characterization and treatment of emerging contaminants in wet weather flows; stormwater treatment using media filtration; efficient stormwater management at US naval facilities; relationships between the variability of stormwater characteristics and land development characteristics; PAH contamination from newly paved surfaces; heavy metal releases from alternative drainage system components; optimized drainage options for biofiltration systems; groundwater impacts from seepage wells used for the subsurface disposal of stormwater; beneficial uses of stormwater in times of changing weather conditions; heavy metal contamination of soils in treated wood burn areas; sources and fate of indicator bacteria in urban areas; and continued enhancements to stormwater water quality models.

He has also carried out a number of receiving water impact studies associated with stormwater. These studies have included a variety of field monitoring activities, including water and sediment quality, fish and benthos taxonomic composition, and laboratory toxicity tests. He is the co-author of a book (published by CRC/Lewis) detailing field, laboratory, and data analyses methods for use in examining stormwater effects on receiving waters.

Dr. Pitt was the project manager and principal investigator of a project with the telecommunications industry (sponsored by Bellcore, AT&T, plus many "baby Bells" from throughout the U.S.) to evaluate and develop methods that may be needed to treat stormwater that collects in telecommunication manholes. This water needs to be pumped before repair operations can be conducted and stormwater NPDES permits are typically required before its discharge to local drainage systems. He has worked with the industry and the EPA and conducted a comprehensive characterization and field evaluation program and developed protocols to examine potential treatment methods.

Dr. Pitt has helped prepare training manuals on the operation of sanitary wastewater treatment plants and on the clean-up of oil spills. He has evaluated the effects of municipal, industrial, and nonpoint water pollution discharges on receiving water quality and beneficial uses, including model development. He has also been involved in the preparation of contingency plans for spills of petroleum products and other hazardous materials, especially in the assessment of potential water and air quality problems. He has completed the noise, air and water quality assessments for a variety of projects; including nuclear and fossil fuel power facilities, oil refineries, oil fields, coal mines, uranium mines, gravel removal operations, airports, urban redevelopment projects, pipelines, and hazardous material transfer and storage facilities. Many of these studies involved field and laboratory work, as well as statistical analyses and modeling. These projects have been located throughout the United States (including Alaska and Hawaii), and in the Middle East. An experienced photographer, Dr. Pitt has used both aerial and underwater photography in conjunction with many projects. He has developed and managed water and air quality laboratories capable of monitoring a wide range of inorganic and organic pollutants.

Dr. Pitt moved to the University of Alabama campus in Tuscaloosa in 2001. Earlier, he had served on the School of Engineering faculty at the University of Alabama at Birmingham from 1987 to 2001. Prior to that, he was a senior engineer for 16 years in industry and government, and continues to consult to many municipalities and engineering firms. He has also taught workshops and has been a guest lecturer at several universities (including the Univ. of Wisconsin; the Univ. of Minnesota; Syracuse University, the University of Nevada, Tel Aviv University, Israel; the University of Guelph, Ontario, Canada; Singapore National University; and the Universität Gesamthochschule, Essen, Germany). He has published more than 100 chapters, books, journal articles, and major research reports. Dr. Pitt is a Board Certified Environmental Engineer with the American Academy of Environmental Engineers and a Diplomate of the American Academy of Water Resources Engineers (eminence), and is a registered engineer in the state of Wisconsin.

Research Funding Obtained as Principal Investigator

Watershed Planning and Development: Green Infrastructure Monitoring Strategy for Combined Sewer Abatement Program (Metropolitan Sewer District of Greater Cincinnati). \$150,950 (2011 – 2014).

Enhanced Stormwater Treatment at Scrap Metal Facilities (Institute of Scrap Recycling Industries, Inc. ISRI): \$108,000 (2013 – 2014).

Modeling Tool for Navy Facilities to Quantify Sources, Loads, and Mitigation Actions of Metals in Storm Water Discharges (US Navy, San Diego, CA). \$140,000 years one and two funding (2011 – 2014).

Evaluation of the Performance of the Full-Scale Upflow Filter in Tuscaloosa, AL (HydroInternational): \$85,000 (2011-2013).

Evaluation of Stormwater Standards for the Development of New EPA Regulations (The Cadmus Group and US EPA) \$50,000 (2011).

Stormwater Non-potable Beneficial Uses and Effects on Urban Infrastructure (Water Environment Research Foundation and US EPA) \$86,000 (2009 – 2011).

Collaborative Research Project: Field Monitoring of Up-Flo Filter - Bama Belle Site (HydroInternational, Portland, ME) \$47,664 (2009 – 2011).

Environmental Contamination Sensor Development and Evaluations Associated with Natural Disasters, Center for Optical Sensors and Spectroscopies, (COSS). (NSF and the University of Alabama at Birmingham): \$675,000 (2008 – 2014).

Biofiltration Media Evaluation (Geosyntec Consultants and Boeing Co., Los Angeles County, CA): \$262,000 (2008 – 2010).

Supplemental Funding for Optical Sensors and Spectroscopies Development (NSF and the University of Alabama at Birmingham): \$16,000 (2008).

National Demonstration of Advanced Drainage Concepts using Green Solutions for CSO Control (US EPA and TetraTech; Kansas City, MO): \$40,070 (2008 – 2013).

Identification and Treatment of Emerging Contaminants in Wet Weather Flows (US Environmental Protection Agency): \$349,958 (2007 - 2013).

Graduate Student Research Program (Alabama Commission on Higher Education) \$168,000 (2006 – 2011).

Verifying the Performance of the Full-Scale Upflow Filter in Tuscaloosa, AL (HydroInternational): \$40,000 (2007-2008).

Developing Local Stormwater Indicator Monitoring Programs to Demonstrate Environmental Results, with the Center for Watershed Protection (EPA Office of Wastewater Management 104(b)3 grant): \$175,040 (2006 – 2008).

Development of the Center for Optical Sensors and Spectroscopies (NSF and the University of Alabama at Birmingham): \$450,000 (2005 – 2008).

Measuring the Performance of the Upflow Filter Installed at the Tuscaloosa City Hall (Hydro-International): \$17,765 (2005 – 2006).

Alabama Highway Drainage Conservation Design Practices (University Transportation Center for Alabama): \$120,819 (2004).

Evaluation of Inlet Treatment Device, an EPA SBIR Phase 2 Demonstration Project, with US Infrastructure, Edison, NJ. (US Environmental Protection Agency): \$16,968 (2004-2005).

Evaluation of NPDES MS4 Stormwater Monitoring Data, with the Center for Watershed Protection (EPA Office of Wastewater Management 104(b)3 grant): \$419,114 (2001-2004).

Techniques for Identifying/Correcting Inappropriate Discharges, with the Center for Watershed Protection (EPA Office of Wastewater Management 104(b)3 grant): \$477,231 (2001-2004).

Erosion and Sediment Control for Highway Construction (University Transportation Center for Alabama): \$119,239 (2001-2002).

Environmental Health, Public Safety, and Social Impacts Associated with Transportation Accidents Involving Hazardous Substances, with the Dept. of Government and Public Service, UAB (University Transportation Center for Alabama): \$121,580 (2000-2001).

Evaluation of New Techniques for the Identification of Inappropriate Discharges into Storm Drainage Systems (University of New Orleans, Urban Waste Management Institute and EPA): \$60,000 (1999).

Guidance Manual for Integrated Wet Weather Flow Collection and Treatment Systems for Newly Urbanized Areas, with the University of Alabama (U.S. Environmental Protection Agency, Cooperative Agreement): \$150,000 project (1996-1998).

Characterization of Manhole Water and Sediment (NYNEX, BellSouth, Bell Atlantic, GTE, SNET, Pacific Bell, US West, Ameritech and AT&T): \$400,000 (1996-1998).

Development and Testing of a Methodology to Assess the Health Risks and Environmental Impacts from Separate Sanitary Sewer Overflows, co-principal investigator, with UAB EARTH Center (U.S. Environmental Protection Agency): \$199,996 (cooperative agreement) (1996-1997).

The Development of a Tunable Laser Spectrophotometric Method for the Analysis of Toxic Water Pollutants, with UAB Dept. of Physics (National Science Foundation): \$580,587 (1995-1998).

Effects, Sources and Treatment of Stormwater Toxicants (U.S. Environmental Protection Agency): \$942,318 cooperative agreement (1992-1997).

Evaluation and Treatment of Manhole Water (Bellcore, Inc.): \$615,048 (1994-1997).

Drainage of Water from Pavement Structures (U.S. Transportation Research Board and Alabama Department of Transportation): \$111,520 (1993-1994).

Demonstration of Investigation Procedures for the Control of Inappropriate Discharges into Storm Drainage Systems (University of New Orleans, Urban Waste Management Institute): \$25,000 (1992).

Modifications to the Source Loading and Management Model (U.S. Environmental Protection Agency, Region V): \$21,050 (1992).

Review of Existing Water Quality Data (Torchmark Development Corp.): \$9,500 (1991).

Identification and Control of Inappropriate Discharges into Storm Drainage (U.S. Environmental Protection Agency, Office of Research and Development and Office of Water): \$101,048 cooperative agreement (1989-1992).

Sources and Treatment of Stormwater Toxicants (U.S. Environmental Protection Agency, Office of Research and Development): \$155,767 cooperative agreement (1989-1992).

Development of Model Watershed Protection Ordinance and Development Plan Reviews (Birmingham Water Works Board): \$53,785 (1988-1989).

Example Consultations

ADS Environmental Services, Huntsville, AL. Verification of flow monitoring equipment performance. 1994-1995.

Brown and Caldwell, Irvine, CA. Design of MCTT installations for testing by Caltrans. Los Angeles. 1998 – 1999.

Brown and Mitchell, Inc., Gulfport, MS. Evaluation of detention pond design for shopping center development. 1995-1996.

Caltrans, California transportation agency. Review of stormwater monitoring program. 2007 – 2008.

C.M. Towers, West Caldwell, NJ. Design consultation for flow-balancing method installations for stormwater and CSO controls. 1993.

Camp Dresser & McKee, Inc., Detroit, MI. Design work for multi-chambered treatment tank (MCTT) stormwater controls for public works yard in Detroit. 1995.

CEDARS (Center for Economic Development and Resource Stewardship) and Tennessee Valley Authority, Nashville, TN. Conservation design for stormwater management at selected industrial and commercial development sites, 2005 – 2007.

CH2M-Hill, Portland, OR. Training for use of SLAMM. 1992.

City of New York, Division of Engineering, NY. Evaluation of Fresh Creek (Brooklyn) FBM installation for CSO controls, 1992-1994, and evaluation of litter and floatable debris control for New York City. 1997 – 2001.

Earth Tech, Inc., Madison, WI. Stormwater treatment at foundry site. 2005 – 2006.

Environment Canada, Ottawa, Ontario, Canada. Evaluation of bacteria sources and control in Ottawa. 1985-1987.

Envirometrics Engineering, Inc., Birmingham, AL. Evaluation of stormwater filtration for the U.S. Army Corps of Engineers. 1995-1996.

Foster Wheeler/Enviresponse, Inc. Edison, NJ. Treatment of stormwater toxicants. 1991-1993.

Fresh Creek Technologies, Inc., West Caldwell, NJ. Evaluation of New York City EquaFlow CSO control system. 1993.

GeoSyntec Consultants, Boston, MA. Enhanced phosphorus control in East of the Hudson watershed. 2005 – 2007.

GeoSyntec Consultants, Portland, OR and Santa Barbara, CA. Advanced stormwater control at industrial site, 2007 – 2009.

Havens and Emerson, Boston, MA. Value engineering evaluation of Cleveland CSO plan. 1993.

HydroInternational, Ltd. Commercialization of the UpFlo™ filter. 2005 – 2006.

Johnson, Johnson & Roy, Inc., Madison, WI. Review of commercial development stormwater control plan. 1994.

K.B. Weygand and Assoc., Birmingham, AL. Preparation of erosion control plan for commercial development. 1995.

Kurahashi & Assoc., Tigard, OR. Development of stormwater models and particle characterizations. 1994.

Law Engineering, Birmingham, AL. Training for stormwater regulation compliance for industrial activities. 1992.

Liesch Companies, Minneapolis, MN. Evaluation of the retention pond design for the Minneapolis-St. Paul International Airport. 1999.

Loomis & Assoc., Austin, TX. Preliminary design for EquaFlow stormwater control program for Waller Creek watershed in Austin. 1995.

Los Angeles County Department of Public Works, CA. Review of stormwater monitoring activities. 1996 - 1998.

MARC (Metropolitan Area Regional Council), Kansas City, MO. Planning, training, and evaluation associated with 10,000 rain garden demonstration project for US EPA. 2007 – 2011.

McGriffert and Assoc., LLC. Tuscaloosa, AL. Design of an industrial stormwater treatment system, 2007.

Metcalf and Eddy, Inc., Wakefield, MA. Review of CSO guidance manual prepared for EPA. 1992.

Moffa & Associates, Syracuse, NY. Decision criteria for CSO evaluations, and retrofitting water quality controls for wet weather flow conditions. 1997-1998.

National Surveying and Engineering. R.A. Smith, Brookfield, WI. Training in the use of the Source Loading and Management Model. 1999.

Natural Resources Defense Council, Los Angeles, CA. Evaluation of Los Angeles County stormwater plan. 1994-1998.

Ontario Ministry of the Environment, Toronto and Ottawa, Ontario, Canada. Stormwater evaluations for industrial activities, and other critical source areas in the Humber River watershed, Toronto. 1985-1988.

OTAK Engineering, Inc., Lake Oswego, OR. Development of joint training program for using stormwater models. 1991.

PARS Environmental (Edison, NJ). Milburn, NJ, demonstration project of seepage well groundwater contamination for US EPA. 2008 – 2012.

P.E. LaMoreaux and Assoc., Tuscaloosa, AL. Evaluation of stormwater drainage design, Shelby Co. 1995-1996.

Santa Clara County Flood Control District, CA. Review of special metals control plan for South San Francisco Bay. 1996.

Southern Environmental Law Center, Charlottesville, VA. Evaluation of industrial effluent effects on the Cahaba River. 1992.

SWMA (Stormwater Management Authority), Jefferson County, AL. Modifications to WinSLAMM incorporating stormwater management costs and interfacing to receiving water models. 2005 – 2006.

Rensselaerville Institute, Rensselaerville, NY. Review of phase II EPA stormwater plan. 1994.

Robert Bein, William Frost & Associates, Irving, CA. Design review of multi-chambered treatment train (MCTT) stormwater installations for Caltrans. 1998 - 1999.

Urban Waste Management Center, Univ. of New Orleans, LA. Training of field personnel for screening testing of stormwater outfall. 1995-1996.

U.S. Environmental Protection Agency. Effects of compost amended soils on infiltration rates. 1997-1998.

U.S. Geological Survey, Madison, WI. Calibration of SLAMM for Wisconsin conditions. 1994-1995.

U.S. Infrastructure, Birmingham, AL. Wet weather flow consulting. 1998-2002.

Washington State Department of Ecology, Olympia, WA. Statistical guidance for the evaluation of stormwater control test protocols. 2002.

Wisconsin Dept. of Natural Resources, Madison, WI. Design of the multi-chambered treatment tank (MCTT) for Milwaukee public works area. 1995.

Woodward Clyde Consultants, Oakland, CA. Evaluation of field screening analysis methods for stormwater outfalls. 1991-1993.

Wright Water Engineers, Denver, CO. Lincoln, NE, bacteria sources and control. 2010 – 2011.

Dissertation

Pitt, R. *Small Storm Urban Flow and Particulate Washoff Contributions to Outfall Discharges*, Ph.D. Dissertation, Civil and Environmental Engineering Department, University of Wisconsin, Madison, WI, November 1987.

Major Computer Programs

WinDETPOND. A Water Quality Detention Pond Analysis and Design Program. 1986-present (with J. Voorhees).

WinSLAMM. Source Loading and Management Model for Stormwater Quality Control. 1978-present (with J. Voorhees).

Books

NRC (National Research Council), Committee on Beneficial uses of Graywater and Stormwater. National Academy of Science. *Beneficial Uses of Graywater and Stormwater: An Assessment of Risks, Costs, and Benefits*. National Academies Press, Washington, D.C. to be published in 2015.

Pitt, R., S. Clark, and D. Lake. *Construction Site Erosion and Sediment Controls: Planning, Design, and Performance, 2nd Edition*. DEStech Publications. Lancaster, PA. 450 pages. To be published in 2014.

James, W., K.N. Irvine, James Y. Li, E.A. McBean, R.E. Pitt, and S.J. Wright (editors). *Pragmatic Modeling of Urban Water Systems*, Monograph 21. Computational Hydraulics International. Guelph, Ontario. 2013. 484 pgs.

James, W., K.N. Irvine, James Y. Li, E.A. McBean, R.E. Pitt, and S.J. Wright (editors). *On Modeling Urban Water Systems*. Monograph 20. ISBN 978-0-9808853-7-8. Computational Hydraulics International. Guelph, Ontario. 2012. 404 pgs.

James, W., K.N. Irvine, James Y. Li, E.A. McBean, R.E. Pitt, and S.J. Wright (editors). *Cognitive Modeling of Urban Water Systems*. Monograph 19. ISBN 978-0-9808853-4-7. Computational Hydraulics International. Guelph, Ontario. 2011.

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Conference Presentations

- Sileshi, R., Pitt, R., and Clark, S. 2014. Lab Column Tests for Predicting Changes in Flows and Particulate Retention through Various Biofilter Mixtures. *Annual Water Environment Federation Technical Exhibition and Conference. WEFTEC 2014*. New Orleans, LA Sept 27-Oct 1, 2014.
- Pitt, R. and C. Bochis, "Standard Land Use Development Characteristics and Stormwater Regulations". *ASCE/ EWRI 2014, World Environmental and Water Resources Congress*, Portland, OR, June 1-5, 2014.
- Talebi, L., Pitt, R., Alfaqih, L., "Evaluation of Retrofitted Green Infrastructure Stormwater Controls in areas served by separate and combined sewers at large scale in Cincinnati, OH". *ASCE/ EWRI 2014, World Environmental and Water Resources Congress*, Portland, OR, June 1-5, 2014.
- Wilson, B., Pitt, R. "'Survival of Indicators of Sewage-borne Pathogens on Simulated Environmental Surface.'" *ASCE/ EWRI 2014, World Environmental and Water Resources Congress*, Portland, OR, June 1-5, 2014.
- Sileshi, R., Pitt, R., and Clark, S. 2014. Flow Rate and Sediment Trapping Laboratory Experiments using Various Biofilter Media. *World Environmental and Water Resources Congress 2014. ASCE-EWRI*. Portland, OR. June 1-5, 2014.
- Sileshi, R., R. Pitt, and S. Clark. 2014. Laboratory Column Experiment on Particle Trapping Capabilities of Various Biofilter Mixtures. *Stormwater and Urban Water Systems Modeling*. Computational Hydraulics International. Guelph, Ontario, Feb 26-27, 2014.
- Pitt, R. "Ranking sites for stormwater control placement while accounting for permit limits, natural background levels, number of sampler, and exceedance frequency." 2013 CASQA 9th Annual Conference. Squaw Valley, CA. Sept 9 – 11, 2013.
- Sileshi, R., R. Pitt, and S. Clark. "Effect of Compaction on Water Flow in Sand-Peat Columns." *2013 International Low Impact Development Symposium*. Saint Paul RiverCentre, Saint Paul, Minnesota, August 18-21, 2013.
- Pitt, R., L. Talebi, D. Bambic, D. O'Bannon, and M. Simon. Performance results from small and large scale system monitoring and modeling of intensive applications of green infrastructure in Kansas City. *2013 International Low Impact Development Symposium*. Saint Paul RiverCentre, Saint Paul, Minnesota, August 18-21, 2013.
- Talebi, L., R. Pitt, and L. Alfaqih. Performance results from large-scale system monitoring and modeling of intensive applications of green infrastructure in areas served by separate and combined sewers in Cincinnati, Ohio. *2013 International Low Impact Development Symposium*. Saint Paul RiverCentre, Saint Paul, Minnesota, August 18-21, 2013.
- Simon, M., J.G. Lee, D. O'Bannon, R. Pitt, J. Wright, and D. Bambic. "Comparison of Modeled Results for Kansas City Middle Blue River Green Infrastructure Pilot Project." *ASCE/ EWRI 2013, World Environmental and Water Resources Congress*, Cincinnati, OH. Conference proceedings. May 19 – 23, 2013
- Sileshi, R., M. Collins, H. Sherer, N. Pelak, R. Pitt, S. Clark. "Laboratory Column Study of Effect of Salt Loadings on Stormwater Biofilters Performance." *2013 World Environmental and Water Resources Congress*, Cincinnati, Ohio, May 19-23.
- Talebi, L., Pitt, R., "Fitting Infiltration Models to Urban Dry Well Data" *ASCE/ EWRI 2013, World Environmental and Water Resources Congress*, Cincinnati, OH, May 19-23, 2013.
- Pitt, R., Talebi, L., O'Bannon, D., Bambic, D., Wright, J., Simon, M., "Comparison of WinSLAMM Modeled Results with Monitored Bioinfiltration Data during Kansas City Green Infrastructure Demonstration Project" *ASCE/ EWRI 2013, World Environmental and Water Resources Congress*, Cincinnati, OH, May 19-23, 2013.
- Sileshi, R., Pitt, R., Talebi, L., Christian, C., "Stormwater Management in the Aftermath of Natural Disasters" *ASCE/ EWRI 2013, World Environmental and Water Resources Congress*, Cincinnati, OH, May 19-23, 2013.
- Talebi, L., Kuczynski, A., Graettinger, A., Pitt, R. "Application of Image Processing and LiDAR Data in Stormwater Management" *ASCE/ EWRI 2013, World Environmental and Water Resources Congress*, Cincinnati, OH, May 19-23, 2013.
- Cai, Y., R. Pitt, J. Bruenjes, and R. Andoh. "Full-Scale Up-Flo® Stormwater Filter Field Verification Tests." 2013 World Environmental & Water Resources Congress, Cincinnati, Ohio, May 19-23, 2013.
- Sileshi, R., R. Pitt, and S. Clark. "Stormwater Management Studies in Areas Undergoing Reconstruction Following the Tornado that Hit Tuscaloosa, AL." *Alabama's Water Environment Association 2013 Technical Conference* April 7 – 10, 2013 - Orange Beach, Alabama.
- Cai, Y., R. Pitt, N. Togawa, K. McGee, K. Osei, and R. Andoh. "Full-Scale Up-Flo® Filter Field Verification Tests." 36th Annual Alabama's Water Environment Association (AWEA) Technical Conference, Orange Beach, Alabama, April 7-10, 2013.
- Pitt, R., Talebi, L., Clark, S., Bean, R., "Beneficial Uses of Urban Stormwater Harvesting" *AWWA, Sustainable Water Management Conference*. Nashville, TN, April 7-10, 2013.

- Talebi, L., Pitt, R., "Evaluation and Demonstration of Stormwater Dry Wells and Cisterns in Millburn Township, New Jersey." *Urban Water Modeling Conference*. Computational Hydraulics International (CHI), Toronto, Canada, February 21 – 22, 2013.
- Pitt, R., Talebi, L., "Modeling Green Infrastructure with Large-Scale Monitoring at Kansas City, Missouri." *Urban Water Modeling Conference*. Computational Hydraulics International (CHI), Toronto, Canada, February 21 - 22, 2013.
- Sileshi, R., R. Pitt, and S. Clark. "Laboratory Column Test for Predicting Changes in Flow with Changes in Various Biofilter Mixture." *46th Annual International Conference on Stormwater and Urban Water Systems Modeling*, Toronto, Ontario. February 21 –22, 2013.
- Cai, Y., R. Pitt, N. Togawa, K. McGee, K. Osei, and R. Andoh. "Full-Scale Up-Flo® Filter Field Verification Tests." 2013 Annual International Conference on Stormwater and Urban Water Systems Modeling, February 21-22, 2013. Computational Hydraulics Int. (CHI), Guelph, Ontario, Canada.
- Steets, B.M., J.E. Jones, and R. Pitt. "Adaptive stormwater management at an industrial site with numeric effluent limits." California Stormwater Quality Association (CASQA) Annual Conference, San Diego, CA, November 9-11, 2012.
- Talebi, L. and R. Pitt. "Changes in chemical and microbiological quality of runoff with the use of drywells; A case study in Millburn, NJ." *85th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC)*, New Orleans, LA, October 1–3, 2012.
- Ogburn, O. and R. Pitt. "The influence of pH and salinity on heavy metal contaminants released into stormwater." *85th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC)*, New Orleans, LA, October 1–3, 2012.
- Goodson, K.L., R. Pitt, S. Subramaniam, and S. Clark. "The effects of increased flows on the treatability of emerging contaminants in a wastewater treatment plant during rain events." *85th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC)*, New Orleans, LA, October 1–3, 2012.
- Pitt, R.. "WinSLAMM: Integrating stormwater management and green technologies." Invited presentation. *50 Years of Watershed Modeling; Past, Present and Future*. Engineering Conferences International. Boulder, CO, September 24 – 26, 2012.
- Voorhees, J., C. Burger, and R. Pitt. "Calibrating WinSLAMM, an urban stormwater quality model, using data from the National Stormwater Quality Database." *50 Years of Watershed Modeling; Past, Present and Future*. Engineering Conferences International. Boulder, CO, September 24 – 26, 2012.
- Pitt, R., J. Voorhees, J. and C. Burger. "The development of sizing and performance production functions of green infrastructure stormwater controls using WinSLAMM." *50 Years of Watershed Modeling; Past, Present and Future*. Engineering Conferences International. Boulder, CO, September 24 – 26, 2012.
- Pitt, R. "Challenges in green infrastructure design and associated failure modes." Invited keynote speaker. 2012 *Sustainable Stormwater Symposium*, ASCE-EWRI and APWA. Portland, OR, September 19 – 20, 2012.
- Sileshi, R., R. Pitt, S. Clark and C. Christian. "Laboratory and field studies of soil characteristics of proposed stormwater bioinfiltration sites." *Water Environment Federation (WEF) Stormwater Symposium*, July 18 – 20, 2012 Baltimore, Maryland.
- Talebi, L., Pitt, R., Clark, S., "Stormwater reuse opportunities and effects on urban infrastructure management; review of practices and proposal of WinSLAMM modeling." *Water Environment Federation (WEF) Stormwater Symposium*, July 18 – 20, 2012 Baltimore, Maryland.
- Bean, R., Pitt, R., "Evapotranspiration data availability for stormwater beneficial use calculations." *Water Environment Federation (WEF) Stormwater Symposium*, July 18 – 20, 2012 Baltimore, Maryland.
- Bean, R., Pitt, R., "Identifying stormwater heavy metal sources at U.S. Naval Facilities using WinSLAMM." *Water Environment Federation (WEF) Stormwater Symposium*, July 18 – 20, 2012 Baltimore, Maryland.
- Goodson, K., R. Pitt, S. Subramaniam and S. Clark; "The effects of stormwater infiltration on the treatability of emerging contaminants in conventional wastewater treatment systems." *Water Environment Federation (WEF) Stormwater Symposium*, July 18 – 20, 2012 Baltimore, Maryland.
- Ogburn, O., R. Pitt, and S. Clark. "Pollutant releases from gutter and piping materials into urban stormwater runoff." *World Environmental and Water Resources Congress 2012*. ASCE-EWRI. Conference Proceedings. Albuquerque, NM May 20-25, 2012.
- Talebi, L., Pitt, R., "Roof runoff harvesting benefits for regional conditions in low density and medium density residential areas" *World Environmental and Water Resources Congress 2012*. ASCE-EWRI. Conference Proceedings. Albuquerque, NM May 20-25, 2012.

- Sileshi, R., R. Pitt, and S. Clark. "Assessing the impact of soil media characteristics on stormwater bioinfiltration device performance: lab and field studies." *World Environmental and Water Resources Congress 2012*. ASCE-EWRI. Conference Proceedings. Albuquerque, NM May 20-25, 2012.
- Bean, R., Pitt, R., "Advancing stormwater beneficial uses: ET mapping in urban areas." *World Environmental and Water Resources Congress 2012*. ASCE-EWRI. Conference Proceedings. Albuquerque, NM May 20-25, 2012.
- Goodson, K., R. Pitt, S. Subramaniam and S. Clark; "Evaluation of the treatability of pharmaceuticals, PAHs, and pesticides during wet weather flows in a wastewater treatment plant." *World Environmental and Water Resources Congress 2012*. ASCE-EWRI. Conference Proceedings. Albuquerque, NM May 20-25, 2012.
- Ogburn, O., R. Pitt, and S. Clark. "The effects of water quality parameters on pollutant leaching from drainage materials." 45th Annual International Conference on *Stormwater and Urban Water Systems Modeling*, Toronto, Ontario. February 22 – 23, 2012.
- Goodson, K.L., R. Pitt, S. Subramaniam, and S. Clark. "The effects of stormwater on wastewater treatability: A study of targeted emerging contaminants at a wastewater treatment plant." 45th Annual International Conference on *Stormwater and Urban Water Systems Modeling*, Toronto, Ontario. February 22 – 23, 2012.
- Wilson, B. and R. Pitt. "Survival of bacterial indicator species on impervious environmental surfaces in Tuscaloosa, Alabama. 45th Annual International Conference on *Stormwater and Urban Water Systems Modeling*, Toronto, Ontario. February 22 – 23, 2012.
- Pitt, R. "Water quality objectives and failure modes of green infrastructure stormwater components." (invited) *Integrated Water Resources Conference*. Florida Water Environment Association. Orlando, FL Jan 26, 2012.
- Talebi, L. and R. Pitt. "Stormwater Non-potable Beneficial Uses and Effects on Urban Infrastructure." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Ogburn, O. and R. Pitt. "Urban Stormwater Runoff Contamination Associated with Gutter and Pipe Material Degradation." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Clark, S.E., and R. Pitt. "Selecting Bioretention Media to Treat Stormwater to Meet Very Low Numeric Permit Limits of Emerging Contaminants." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Goodson, K.L., R. Pitt, S. Subramaniam, and S.E. Clark. "The Treatability of Emerging Contaminants in Wastewater Treatment Plants during Wet Weather Flows." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Veeravalli, S.U. and R. Pitt. "Pollutant Releases during the Initial Aging of Asphaltic Pavements." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Sileshi, R., R. Pitt, and S.E. Clark. "Experimental Study on Particle Clogging of Biofilter Device in Urban Areas." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Togawa, N., R. Pitt, R. Andoh, and K. Osei. "Field performance of upflow filtration device for stormwater treatment." 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC), Los Angeles, CA, October 15–19, 2011.
- Steets, B.M., J.E. Jones, M.K. Stenstrom, and R. Pitt. "Stormwater Treatment Planning for an Industrial Permit with Numeric Limits." California Stormwater Quality Association (CASQA) Annual Conference, Monterey, CA, Sept 28, 2011.
- Sileshi, R., R. Pitt, and S. Clark. "Impacts of Soil Texture, Structure, and Compaction on Bioinfiltration Device Performance: Results of Lab and Field Investigations," *2011 Low Impact Development Symposium: Greening the Urban Environment*. Philadelphia, PA. Sept 25 – 28, 2011.
- Clark, S., and R. Pitt. "Selecting components of an engineered media based on pollutant removal requirements." Philadelphia Low Impact Development Symposium: Greening the Urban Environment. September 25-28, 2011.
- Talebi, L. and R. Pitt. "Stormwater non-potable beneficial uses: a review of United States practice." Philadelphia Low Impact Development Symposium: Greening the Urban Environment. September 25-28, 2011.
- Talebi, L. and R. Pitt. "Modeling Groundwater Recharge at Stormwater Drywell Installation: a case study." Philadelphia Low Impact Development Symposium: Greening the Urban Environment. September 25-28, 2011.
- Bean, R. and R. Pitt. "ET Mapping in Urban Areas as an Application for Beneficial Uses of Stormwater." Philadelphia Low Impact Development Symposium: Greening the Urban Environment. September 25-28, 2011.
- Pitt, R. "Meeting CSO Management Goals using Green Infrastructure: Kansas City EPA National Demonstration Project." 11th International Conference Computing and Control in the Water Industry: Urban Water Management:

- Challenges and Opportunities. University of Exeter, Centre for Water Systems, Exeter, UK. September 4 – 7, 2011.
- Pitt, R. “Control of Metallic and Organic Toxicants.” 11th International Conference Computing and Control in the Water Industry: Urban Water Management: Challenges and Opportunities. University of Exeter, Centre for Water Systems, Exeter, UK. September 4 – 7, 2011.
- Talebi, L. and R. Pitt. “Stormwater Non-potable Beneficial Uses: Modeling Groundwater Recharge at a Stormwater Drywell Installation.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Ogburn, O. and R. Pitt. “Gutter and Pipe Material Metal Losses during Long-Term Exposures at Different pH Conditions.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Wilson, B. and R. Pitt. “Survival of Bacterial Indicator-species on Impervious Surfaces.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Clark, S. and R. Pitt. “Filtered Metals Control in Stormwater using Engineered Media.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Veeravalli, S.U., and R. Pitt. “Pollutant Releases during the Initial Aging of Asphaltic Pavements.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Harden, J.D., and R. Pitt. “Retardance of Rainwater-Leached Metals in Amended Soil Systems: A Case Study, Agricultural Amendments Effect on a CCA-wood Ash/Soil System.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Sileshi, R., R. Pitt, and S. Clark. “Examining the clogging potential of underdrain material for stormwater biofilter.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Togawa, N., R. Pitt, R. Andoh, and K. Osei. “Field Performance Result of UpFlow Stormwater Treatment Device.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Goodson, K.L., R. Pitt, S. Subramanian, and S. Clark. “The Treatability of Emerging Contaminants in Wastewater Treatment Plants during Wet Weather Flows.” ASCE/EWRI World Environment and Water Resources Congress. Palm Springs, CA, May 22-26, 2011.
- Sileshi, R., R. Pitt, and S. Clark. “SmartDrain™ for Enhanced Biofiltration Controls.” *2011 Fox-Wolf Stormwater Conference*. Appleton, WI, May 11, 2011.
- Pitt, R. “Simple Hydrograph Shapes for Urban Stormwater Water Quality Analyses.” Stormwater and Urban Water Systems Modeling Conference, Toronto, Ontario. February 24-25, 2011.
- Pitt, R. “Long-term Continuous Simulations for Evaluating Storage-Treatment Design Options of Stormwater Filters.” Stormwater and Urban Water Systems Modeling Conference, Toronto, Ontario. February 24-25, 2011.
- Pitt, R. and J. Voorhees. “Modeling Green Infrastructure Components in a Combined Sewer Area.” Stormwater and Urban Water Systems Modeling Conference, Toronto, Ontario. February 24-25, 2011.
- Clark, S.E., and R. Pitt. “Treatability of filtered heavy metals by (bio)(in)filtration media: Water and soil chemistry effects.” *WEFTEC, the 83rd Annual Water Environment Federation Technical Exhibition and Conference*. New Orleans, LA, October 2–6, 2010.
- Wilson, B. and R. Pitt. “Bacterial indicator-species survival on impervious surfaces.” *WEFTEC, the 83rd Annual Water Environment Federation Technical Exhibition and Conference*. New Orleans, LA, October 2–6, 2010.
- Togawa, N., R. Pitt, B. Andoh, K. Osei. “Stormwater treatment by upflow filtration device.” *WEFTEC, the 83rd Annual Water Environment Federation Technical Exhibition and Conference*. New Orleans, LA, October 2–6, 2010.
- Pitt, R., S. Clark, and B. Sheets. “Treatability of stormwater toxicants using biofiltration media.” *WEFTEC, the 83rd Annual Water Environment Federation Technical Exhibition and Conference*. New Orleans, LA, October 2–6, 2010.
- Pitt, R., J. Voorhees, and S. Clark. “Integrating green infrastructure components into a combined sewer service area model.” *ASCE/EWRI, Watershed 2010: Innovations in Watershed Management under Land Use and Climate Change*. Madison, WI, Aug 23-27, 2010.
- Clark, S., R. Pitt, and K. Baker. “Selecting stormwater (bio)filtration sites and soil-based media.” *ASCE/EWRI, Watershed 2010: Innovations in Watershed Management under Land Use and Climate Change*. Madison, WI, Aug 23-27, 2010.
- Pitt, R., S. Clark, and B. Steets. “Engineered bioretention media for industrial stormwater treatment.” *ASCE/EWRI, Watershed 2010: Innovations in Watershed Management under Land Use and Climate Change*. Madison, WI, Aug 23-27, 2010.

- Sileshi, R., R. Pitt, and S. Clark. "Enhanced biofilter treatment of urban stormwater by optimizing the hydraulic residence time in the media." *ASCE/EWRI, Watershed 2010: Innovations in Watershed Management under Land Use and Climate Change*. Madison, WI, Aug 23-27, 2010.
- Clark, S.E., and R. Pitt. "Integration of site water chemistry and media characteristics to design (bio)(in)filtration systems." *Water Environment & Water Resources Congress 2010; Challenges of Change*. Providence, RI, May 16-20, 2010.
- Pitt, R., S. Clark, and B. Steets. "Laboratory evaluations to support the design of bioretention systems in the southwestern U.S." *Water Environment & Water Resources Congress 2010; Challenges of Change*. Providence, RI, May 16-20, 2010.
- Pitt, R., J. Voorhees, and S. Clark. "Integrating green infrastructure into a combined sewer service area model." *Water Environment & Water Resources Congress 2010; Challenges of Change*. Providence, RI, May 16-20, 2010.
- Pitt, R., S. Clark, and B. Steets. "Evaluation of the contaminant removal potential of biofiltration media." *2010 International Low Impact Development Conference: Redefining Water in the City*. San Francisco, CA. April 11 – 14, 2010.
- Clark, S., and R. Pitt. "Considerations in Selecting a (Bio)filtration media to optimize lifespan and pollutant removal." *2010 International Low Impact Development Conference: Redefining Water in the City*. San Francisco, CA. April 11 – 14, 2010.
- Pitt, R., and J. Voorhees. "Integrated modeling of green infrastructure components in an area served by combined sewers." *2010 International Low Impact Development Conference: Redefining Water in the City*. San Francisco, CA. April 11 – 14, 2010.
- Sileshi, R., R. Pitt, and S. Clark. "Enhanced biofilter treatment of stormwater by optimizing the residence time." *2010 International Low Impact Development Conference: Redefining Water in the City*. San Francisco, CA. April 11 – 14, 2010.
- Pitt, R., J. Voorhees, and C. Burger. "WinSLAMM capabilities in emerging designs." Tools for Implementing LID Workshop. *2010 International Low Impact Development Conference: Redefining Water in the City*. San Francisco, CA. April 11 – 14, 2010.
- Pitt, R. "The use of local stormwater monitoring in conjunction with the National Stormwater Quality Database (NSQD, ver. 3)." Invited presentation. *10-year Water Monitoring Conference; Monitoring for the Next Decade*. Ames, Iowa, April 9 and 10, 2010.
- Pitt, R. "Advanced treatment of stormwater toxicants." Invited seminar to Department of Civil Engineering, University of Technology, Sydney, Australia. March 11, 2010.
- Pitt, R. "Receiving water impacts associated with stormwater discharges." Invited keynote address. *Pensacola Stormwater Management Conference*. Pensacola, FL Feb 2010.
- Wilson, B. and R. Pitt. *Natural Background of Indicator Bacteria Species in Stormwater*. American Water Resources Association Annual Conference, Seattle, WA. Nov, 9 – 12, 2009.
- Steets, B., M. Stenstrom, R. Pitt. "BMP achievability relative to water quality standards – Are there non-compliance risks for NPDES permittees after BMP implementation?" *California Stormwater Quality Association 5th Annual Conference*. San Diego, CA. Nov. 2 – 4, 2009.
- Pitt, R. "Combined Sewers: Regulations and Emerging Technology." Invited keynote address, *OPCUDS: 2009 International Conference on Overflow Pollution Control for Urban Drainage Systems*. China Urban Water Association, Shanghai Water Reclamation Trade Association, Shanghai Environmental Protection Bureau, Shanghai Water Authority, Tongji University, International Water Association, Shanghai Urban Construction Design & Research Institute, and China Water Industry Net. Shanghai, China. October 24, 2009.
- Clark, S.E., R. Pitt, K.H. Baker. "Considerations in the selection of stormwater (bio)filtration media." *2009 Pennsylvania Stormwater Management Symposium*, Villanova University, October 14 – 15, 2009.
- Clark, S.E., R. Pitt, B. Steets. "Media evaluation for use in engineered natural treatment systems. (Poster)" *2009 Pennsylvania Stormwater Management Symposium*, Villanova University, October 14 – 15, 2009.
- Clark, S.E., C.Y.S. Siu, R. Pitt. "Errors associated with sampling and measurement. (Poster)" *2009 Pennsylvania Stormwater Management Symposium*, Villanova University, October 14 – 15, 2009.
- Wilson, B. and R. Pitt. "Non-sewage indicator species in storm runoff." *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.
- Avila, H., R. Pitt, S. Clark. "Simplified model to estimate suspended sediment effluent concentrations due to scour from catchbasin sumps. (Poster)" *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.

- Pitt, R., J. Voorhees, S. Clark. "Modeling the performance of advanced stormwater management options and the use of decision analysis in selecting the most appropriate set of controls." *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.
- Pitt, R., S. Clark, B. Steets, J. Howell. "Tests of biofiltration media for engineered natural treatment systems. (Poster)." *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.
- Struck, S.D., "Green infrastructure for CSO control in Kansas City, Missouri." *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.
- Bochis, E. and R. Pitt. "Land use and runoff uncertainty (poster)." *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.
- Togawa, N., R. Pitt, R. Andoh, K. Osei, R. Field, and A. Tafuri. "Field performance of a newly developed upflow filtration device." *2009 Water Environment Federation Technical Exposition and Conference*, Orlando, FL, October 11 – 14, 2009.
- Andoh, T., R. Pitt, D. Scott, K. Osei, J. MacKinnon, and N. Togawa "The Up-Flo[®] Filter – An advanced novel high-rate stormwater filtration system." StormCon, Anaheim, CA, August 16 – 20, 2009.
- Pitt, R. "National Research Council stormwater management report." Invited keynote address. Oregon Association of Clean Water Agencies Annual Conference. Bend, OR. July 23 – 24, 2009.
- Pitt, R. "Infiltration of stormwater while protecting groundwater." Oregon Association of Clean Water Agencies Annual Conference. Bend, OR. July 23 – 24, 2009.
- Bochis, C. and R.E. Pitt. "Land use and runoff uncertainty." *2009 World Environmental and Water Resources Congress Proceedings*, Kansas City, MO, May 18 - 22, 2009.
- Bathi, J.R., R. Pitt, and S.E. Clark. "Associations of PAHs with size fractionated sediment particles." *2009 World Environmental and Water Resources Congress Proceedings*, Kansas City, MO, May 18 - 22, 2009.
- Avila, H. and R. Pitt. "Physical experimentation and CFD modeling to evaluate sediment scour in catchbasin sumps." *2009 World Environmental and Water Resources Congress Proceedings*, Kansas City, MO, May 18 - 22, 2009.
- Togawa, N. and R. Pitt. "Controlled full-scale testing of an up-flow filtration device." *2009 World Environmental and Water Resources Congress Proceedings*, Kansas City, MO, May 18 - 22, 2009.
- Pitt, R. and J. Voorhees. "Green infrastructure performance modeling with WinSLAMM." *2009 World Environmental and Water Resources Congress Proceedings*, Kansas City, MO, May 18 - 22, 2009.
- Andoh, R/Y.G., R. Pitt, N. Togawa, and K. Osei. "Stormwater treatment using the high-rate upflow filtration system." *6th International Water Sensitive Urban Design Conference and Hydropolis*. Perth, Western Australia. May 5 – 8, 2009.
- Pitt, R. "Urban stormwater management in the United States, a summary of a recent National Research Council committee report." *Urban Stormwater Management Conference, Great Rivers Chapter of the International Erosion Control Association*, Jefferson City, MO, March 26, 2009.
- Pitt, R. "Current stormwater research at the University of Alabama." *Alabama ASCE Winter Conference*. Tuscaloosa, AL, January 29, 2009.
- Pitt, R. "Integrated stormwater management for watershed sustainability." Invited presentation. *Environmental and Water Resources Engineering Seminar*, University of California, Los Angeles. November 12, 2008.
- Pitt, R., A. Maestre, H. Hyche, and N. Togawa. "The updated National Stormwater Quality Database (NSQD), Version 3." *2008 Water Environment Federation Technical Exposition and Conference*, Chicago, IL, October 18 – 22, 2008.
- Bathi, J.R. and R. Pitt, R. Findlay, S.E. Clark, S. Mirov. "Distribution of polycyclic aromatic hydrocarbons among sediment size fractions determined by thermal desorption gas chromatography mass spectrometry." *2008 Water Environment Federation Technical Exposition and Conference*, Chicago, IL, October 18 – 22, 2008.
- Alfaqih, L., R. Pitt, and D. Hale. "E. coli pollution in Alabama's Lake Tuscaloosa watershed: identifying potential solutions using a decision analysis approach." *2008 Water Environment Federation Technical Exposition and Conference*, Chicago, IL, October 18 – 22, 2008.
- Avila, H. and R. Pitt. "Scour of pre-deposited sediment in catchbasin sumps – experimental results from a full-scale physical model." *2008 Water Environment Federation Technical Exposition and Conference*, Chicago, IL, October 18 – 22, 2008.
- Pitt, R. "Treatment system monitoring strategies and overlooked details," invited speaker for *Challenges in Monitoring and Modelling of Stormwater Treatment Systems* workshop. 11th International Conference in Urban Drainage, Edinburgh, Scotland, August 31 to Sept. 5, 2008.

- Pitt, R. "Modeling tools used in the US for examining stormwater infiltration," invited speaker for *Design, Modelling and Performance of Infiltration for Source Controls* workshop. 11th International Conference in Urban Drainage, Edinburgh, Scotland, August 31 to Sept. 5, 2008.
- Bathi, J.R., R. Pitt, R. Findlay, and S.E. Clark. "Analyses of PAHs in urban stormwater particulates," 11th International Conference in Urban Drainage, Edinburgh, Scotland, August 31 to Sept. 5, 2008.
- Avila, H. and R. Pitt. "The calibration and use of CFD models to examine scour from stormwater treatment devices – hydrodynamic analysis," 11th International Conference in Urban Drainage, Edinburgh, Scotland, August 31 to Sept. 5, 2008.
- Siu, C.Y.S., S.E. Clark, R. Pitt, and. "Errors associated with sampling and measurement of solids during the evaluation of stormwater treatment devices," 11th International Conference in Urban Drainage, Edinburgh, Scotland, August 31 to Sept. 5, 2008.
- Pitt, R., R. Andoh, S.E. Clark. "Laboratory and field tests of the Up-Flo™ Filter," 11th International Conference in Urban Drainage, Edinburgh, Scotland, August 31 to Sept. 5, 2008.
- Pitt, R. "WinSLAMM features to calculate benefits of green infrastructure in combined sewer drainages." Invited speaker. *CUASHI Science Colloquium; Resilience & Vulnerability of Natural and Managed Hydrologic Systems*, July 14-16, 2008, Boulder, Colorado,
- Pitt, R. "Stormwater pathogens," invited panel member. Presented at the *World Environmental & Water Resources Congress 2008*. ASCE - EWRI. Honolulu, HI. May 12 – 16, 2008.
- Siu, C.Y.S., R. Pitt, and S.E. Clark. "Errors associated with solids analysis," Presented at the *World Environmental & Water Resources Congress 2008*. ASCE - EWRI. Honolulu, HI. May 12 – 16, 2008 (poster).
- Pitt, R. "Effective urban best management practices," invited luncheon speaker. Municipal Stormwater Conference: Implementation of Alabama's Stormwater Regulations and How That Impacts NPDES Permits. Alabama Department of Environmental Management. Montgomery, AL. April 22, 2008
- Pitt, R. "Effectiveness of grass swales as a stormwater control," invited speaker, Stormwater BMP Academy, Black Warrior Clean Water Partnership. Northport and Jasper, AL April 15 – 16, 2008.
- Pitt, R. "Impacts of construction on soil permeability," invited speaker, Stormwater BMP Academy, Black Warrior Clean Water Partnership. Northport and Jasper, AL April 15 – 16, 2008.
- Pitt, R. "Regional urban receiving water problems and pollutant sources," invited speaker, Stormwater BMP Academy, Black Warrior Clean Water Partnership. Northport and Jasper, AL April 15 – 16, 2008.
- Avila, H., R. Pitt. "Scour in stormwater catchbasin devices – experimental results form a physical model." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 21 and 22, 2008.
- Alfaqih, L. and R. Pitt. "The use of decision analysis and watershed modeling to investigate *E. coli* potential sources and solutions in the Lake Tuscaloosa watershed, Alabama." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 21 and 22, 2008.
- Christian, C. and R. Pitt. "Effective best management practices in urban areas," invited presentation at the 2008 Alabama Department of Environmental Management Non Point Source Conference. Montgomery, AL. January 30, 2008.
- Ritchie, S.M., Johnson, P.D., and Pitt, R.E., "Identification and treatment of emerging contaminants in wet weather flows," presented at the 2007 AIChE National Conference, Salt Lake City, UT, November 2007.
- Bathi, J. R., Pitt, R., Mirov. S. "Understanding the fates of PAHs using thermal desorption as an analytical tool." *NSF EPSCoR National Conference*, Hawaii, November 6-9, 2007 (poster).
- Clark, S. E., Siu, C. Y. S., Roenning, C. D., Treese, D. P., Pitt, R., Bathi, J. R. "Automatic sampler efficiency for stormwater solids." Presented at the 2007 Pennsylvania Stormwater Management Symposium. Villanova, October 17-18, 2007. (poster)
- Clark, S.E., and R. Pitt. "Proposed evaluation methodology for predicting groundwater contamination potential from stormwater infiltration activities." Presented at the 2007 Pennsylvania Stormwater Management Symposium, Villanova Urban Stormwater Partnership, Villanova, PA, October 17-18, 2007.
- Clark, S.E., C.Y.S. Siu and R. Pitt. "Measuring solids concentration in stormwater runoff." Presented at the 2007 Pennsylvania Stormwater Management Symposium, Villanova Urban Stormwater Partnership, Villanova, PA, October 17-18, 2007. (poster)
- Pratap, M., S.E. Clark, R. Pitt, U. Khambhammettu, C. Roenning, D. Treese, C.Y.S. Siu. "Runoff polishing by natural media filtration: Upflow vs. downflow." Presented at the 2007 Pennsylvania Stormwater Management Symposium, Villanova Urban Stormwater Partnership, Villanova, PA, October 17-18, 2007. (poster)

- Avila, H, Pitt, R, Durrans, S. "Analysis of shear stress and potential scour of sediments from stormwater catchbasin sumps using a 2D-CFD model." Presented at the *2007 Water Environment Federation Technical Exposition and Conference*, San Diego, CA, October 2007 (poster)
- Hyche, H., R. Pitt, A. Maestre "Extensions to the National Stormwater Quality Database (NSQD)." Presented at the *2007 Water Environment Federation Technical Exposition and Conference*, San Diego, CA, October 2007 (poster)
- Al-Faqih, L., R. Pitt, D. Hale. "Application of an environmental decision analysis framework on the E-coli issues in the Lake Tuscaloosa Watershed." Presented at the *2007 Water Environment Federation Technical Exposition and Conference*, San Diego, CA, October 2007
- Pitt, R. "The National Stormwater Quality Database (NSQD) and related monitoring guidance." *National Stormwater Coordinator's Meeting*, UA EPA. Denver, CO Sept 11 – 13, 2007 (invited)
- Pitt, R., Bathi, J, C. Greer, K. Boykin, R. Rogers, "Multi-disciplinary collaborative sustainable environmental land-related research at the University of Alabama." Presented at the *2007 Gulf Coast Forum: Gulf States Alliance: Network Science and Recovery*, Biloxi, Mississippi, August 20-23, 2007 (poster)
- Avila, H, Pitt, R. "CFD modeling and full-scale verification of sediment scour potential from stormwater controls." Presented at the *Urban Runoff Modeling Conference: Intelligent Modeling to Improve Stormwater Management*, Engineering Conferences International. Arcata, CA, July 2007 (poster)
- Pitt, R., S. Clark, and J. Voorhees. "Water removal in bioretention devices by evapotranspiration processes and related issues affecting performance." Presented at the *Urban Runoff Modeling Conference: Intelligent Modeling to Improve Stormwater Management*, Engineering Conferences International. Arcata, CA, July 2007 (invited)
- Pitt, R. and J. Voorhees. "The use of WinSLAMM to evaluate combinations of source are and outfall controls using continuous, long-term rainfall records." Presented at the *Urban Runoff Modeling Conference: Intelligent Modeling to Improve Stormwater Management*, Engineering Conferences International. Arcata, CA, July 2007 (invited)
- Pitt, R. and J. Voorhees. "Demonstration of WinSLAMM, The Source Loading and Management Model." Presented at the *Urban Runoff Modeling Conference: Intelligent Modeling to Improve Stormwater Management*, Engineering Conferences International. Arcata, CA, July 2007 (invited)
- Avila, H, Pitt, R, Durrans, S. "Analysis of potential scour of sediments from stormwater inlet catchbasin sumps: A CFD approach." Presented at the *World Environmental & Water Resources Congress 2007*. ASCE - EWRI. Tampa, FL. May 15 – 19, 2007 (poster)
- Pitt, R, and J. Voorhees. "The selection of an urban runoff control program using decision analyses." Presented at the *World Environmental & Water Resources Congress 2007*. ASCE - EWRI. Tampa, FL. May 15 – 19, 2007 (poster)
- Khambhammettu, U., S.E. Clark, R. Pitt. "Protocols for quantifying solids removal performance during controlled testing of manufactured treatment devices." Presented at the *World Environmental and Water Resources Congress 2007*. ASCE/EWRI, Tampa, FL, May 15 – 19, 2007.
- Pratap, M.R., U. Khambhammettu, S.E. Clark, R. Pitt. "Stormwater polishing: Upflow vs. downflow filters." Presented at the *World Environmental and Water Resources Congress 2007*. ASCE/EWRI, Tampa, FL, May 15 – 19, 2007.
- Bathi, J. and R. Pitt. "Fates of polycyclic aromatic hydrocarbons (PAHs) affecting treatability." Presented at the *World Environmental & Water Resources Congress 2007*. ASCE - EWRI. Tampa, FL. May 15 – 19, 2007 (poster)
- Bochis, C., R. Pitt, and P. Johnson. "Modeling flow-duration characteristics for different stormwater controls." Presented at the *World Environmental & Water Resources Congress 2007*. ASCE - EWRI. Tampa, FL. May 15 – 19, 2007 (poster)
- Andoh, R., R. Pitt, and L. Glennon. "Upflow filtration system for stormwater treatment." Presented at the *2007 South Pacific Stormwater Conference*. New Zealand Water and Waste Association. Auckland, New Zealand May 16 – 18, 2006.
- Bathi, J.R., Pitt, R., and Findlay, R., "Standardization of thermal desorption GC/MS analyses for polycyclic aromatic hydrocarbons and comparison of recoveries for two different sample matrices." Presented at the *2007 Annual Mississippi Water Resources Conference*, Jackson, Mississippi, April 23 – 24, 2007.
- Avila, H. and R. Pitt, "Experimental design analysis applied to factors related to migration of sediment out of a stormwater catchbasin sump." Presented at the *2007 Annual Mississippi Water Resources Conference*, Jackson, Mississippi, April 23 – 24, 2007.
- Faqih, L. and R. Pitt. "Water and sanitary infrastructure issues: A methodology (EDAF) to assist decision makers in choosing sustainable infrastructure systems." Presented at *Alabama's Water Environment Association 2007 Technical Conference*. Orange Beach, AL, April 15 – 18, 2007.

- Pitt, R. The selection of an urban runoff control program using decision analysis. Presented at *Alabama's Water Environment Association 2007 Technical Conference*. Orange Beach, AL, April 15 – 18, 2007.
- Bochis, C., R. Pitt, and P. Johnson. "Modeled flow duration characteristics for different stormwater controls." Winner of best poster award. Presented at *Alabama's Water Environment Association 2007 Technical Conference*. Orange Beach, AL, April 15 – 18, 2007 (poster)
- Avila, H. and R. Pitt. "Evaluation of parameters involved in sediment scour potential in stormwater catchbasin sumps Abstract." Presented at *Alabama's Water Environment Association 2007 Technical Conference*. Orange Beach, AL, April 15 – 18, 2007 (poster)
- Bathi, J. and R. Pitt. "Fate of emerging contaminants in stormwater: A case study of polycyclic aromatic hydrocarbons (PAHs)." Presented at *Alabama's Water Environment Association 2007 Technical Conference*. Orange Beach, AL, April 15 – 18, 2007 (poster)
- Hyche, S.H., R. Pitt, and A. Maestre. "National Stormwater Quality Database, version 3." Presented at *Alabama's Water Environment Association 2007 Technical Conference*. Orange Beach, AL, April 15 – 18, 2007 (poster)
- Narayanan, A, C. Bochis, and R. Pitt. "Modeled flow duration variations and costs for pollutant removal associated with different stormwater control practices." Presented at *Georgia Water Resources Conference 2007*. Athens, GA, March 27 – 29, 2007.
- Pitt, R., Y. Nara, J. Kirby, and S.R. Durrans. "Particle retention in grass swale systems." Presented at the 2nd *National Low Impact Development Conference*. Wilmington, North Carolina. March 12-14, 2007 (invited)
- Pitt, R. J. Voorhees, and S. Clark. "Evapotranspiration and related calculations for stormwater biofiltration devices: Proposed calculation scenario and data." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 22 and 23, 2007.
- Bochis, C., R. Pitt, and P. Johnson. "Land development characteristics in the Southeastern United States." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 22 and 23, 2007.
- Avila, H., R. Pitt, and S.R. Durrans. "Factors affecting scour of previously captured sediment from stormwater catchbasin sumps." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 22 and 23, 2007.
- Pitt, R. "Design/construction/maintenance techniques for successful stormwater bioretention and infiltration." Keynote speaker. Presented at the *American Society of Landscape Architects' Annual Meeting*. Atlantic City, NJ. January 28 – 30, 2007. (invited)
- Al-Faqih, L., R. Pitt, and P. Johnson. "Decision Analysis Applications for the Sustainability of Global Urban Water Resources and Drainage Systems." 79th *Annual Water Environment Federation Technical Exposition and Conference*. Dallas, TX. Oct. 22 – 25, 2006. conference CD.
- Narayanan, A., C.Bochis, R. Pitt. "Modeled Flow Duration Variations of Stormwater Discharges, Pollutant Discharges and Costs Due to Different Control Practices." Presented at the 79th *Annual Water Environment Federation Technical Exposition and Conference*. Dallas, TX. Oct. 22 – 25, 2006. conference CD (poster)
- Khambhammettu, U., R. Pitt, R. Andoh, and D. Woelkers. "Full Scale Evaluation of Upflow™ Filter - A Catch Basin Insert for the Treatment of Stormwater at Critical Source Areas." Presented at the 79th *Annual Water Environment Federation Technical Exposition and Conference*. Dallas, TX. Oct. 22 – 25, 2006. conference CD.
- Glennon, L., R. Pitt, and S. Clark. "Verification of the UpFlo Filter: An upflow filter for stormwater treatment at critical source areas." Presented at *StormCon, The North American Surface Water Quality Conference & Exposition*, Denver, CO. July 24 – 27, 2006.
- Woelkers, D., R. Pitt, and S. Clark. "Use of filtration systems for control of pollutants in stormwater runoff." Presented at *StormCon, The North American Surface Water Quality Conference & Exposition*, Denver, CO. July 24 – 27, 2006.
- Pitt, R. "Potential Risks and Benefits of Stormwater Reuse" Keynote Address. Presented at *Why Water Suppliers Should Care about Stormwater Management* conference. New England Water and Wastewater Association, Durham, NH. October 12 – 13, 2006. (invited)
- Pitt, R. "Integrated Watershed Management in Urban Areas." Presented at the Environmental Engineering and Science Seminar Series, University of New Hampshire, Durham, NH. October 11, 2006. (invited)
- Pitt, R. "Identification of Inappropriate Discharges to Storm Drainage Systems (Field Screening)." Presented at the 20th *Annual Alabama Water Resources Conference and Symposium*, Orange Beach, AL Sept. 7-8, 2006.
- Pitt, R. "Integrated Watershed Management," Urban Watershed Management Keynote Presentation, Presented at the *World Environmental and Water Resources Congress 2006*, Omaha, NE. May 21 – 25, 2006. (invited)
- Pitt, R. "UpFlow filtration for the treatment of stormwater." Presented at the *Florida Stormwater Research Symposium*. Orlando, FL. May 4 – 5, 2006. (invited)

- Pitt, R. "SUDS - the current US perspective: Integrated Storm Water Management in New Development Areas" Keynote Presentation, Presented at the *International Association of Hydrogeologists (Irish Group) Annual Meeting*. Tullamore, Ireland. April 25 – 26. 2006. (invited)
- Pitt, R. "Groundwater contamination potential associated with stormwater infiltration," Presented at the *International Association of Hydrogeologists (Irish Group) Annual Meeting*. Tullamore, Ireland. April 25 – 26. 2006. (invited)
- Maestre, A. R. Pitt, and D. Becker. "Stormwater conservation design case study." Presented at *Alabama's Water Environment Association 2006 Conference*. Orange Beach, AL. April 23 – 26, 2006.
- Maestre, A. and R. Pitt. "Identification of inappropriate discharges to storm drainage systems ("field screening")," Presented at *Alabama's Water Environment Association 2006 Conference*. Orange Beach, AL. April 23 – 26, 2006.
- Pitt, R. "Soils and swales research at the University of Alabama." Presented at *Swale Research at the US EPA symposium*, Edison, NJ. March 23, 2006. (invited)
- Pitt, R. "Stormwater treatment at critical source areas." Keynote Presentation. Presented at *The Changing Face of the Stormwater Industry*. Hydro International, Ltd. Portland, ME. March 16, 2006. (invited)
- Maestre, A. and R. Pitt. "Comparisons of stormwater databases: NURP, USGS, CDM, BMP Database, NSQD." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 23 and 24, 2006.
- Pitt, R. and J. Voorhees. "Using decision analyses to select an urban runoff control program" Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 23 and 24, 2006.
- Khambhammettu, U. and R. Pitt "UpFlow filtration for the treatment of stormwater at critical source areas." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 23 and 24, 2006.
- Bathi, J. and R. Pitt. "Sample preparation for GC/MS analysis to study the partition of organic contaminants in water," Presented at the *Alabama EPSCoR Annual Conference*, Talladega, AL, February 2006.
- Marquecho, R. and R. Pitt (2005). "Metal Associations with Stormwater Particulates," Presented at the *78th Annual Water Environment Federation Technical Exposition and Conference*. Washington, D.C. Oct. 29 – Nov. 2, 2005.
- Bochis-Micu, C. and R. Pitt (2005). "Impervious Surfaces in Urban Watersheds," Presented at the *78th Annual Water Environment Federation Technical Exposition and Conference*. Washington, D.C. Oct. 29 – Nov. 2, 2005.
- Clark, S.E., M.M. Lalor, R. Pitt, R. Field. "Stormwater pollution from common building materials." Presented at the *78th Annual Water Environment Federation Technical Exposition and Conference*. Washington, D.C. Oct. 29 – Nov. 2, 2005.
- Nara, Y., R. Pitt, S.R. Durrans, and J. Kirby. "Stormwater sediment transport in grass swales during small rains." Presented at the *78th Annual Water Environment Federation Technical Exposition and Conference*. Washington, D.C. Oct. 29 – Nov. 2, 2005.
- Pitt, R. and A. Maestre. "Stormwater quality as described in the National Stormwater Quality Database." Presented at the *10th International Conference on Urban Drainage*, Copenhagen, Denmark. August 21-26, 2005.
- Clark, S.E., M.M. Lalor, R. Pitt, and R. Field. "Wet-weather pollution from commonly-used building materials." Presented at the *10th International Conference on Urban Drainage*, Copenhagen, Denmark. August 21-26, 2005.
- Clark, S.E., P. Johnson, R. Pitt, S. Gill, and M. Pratap. "Filtration for metals removal from stormwater." Presented at the *10th International Conference on Urban Drainage*, Copenhagen, Denmark. August 21-26, 2005.
- Pitt, R., S. Chen, S. Clark, and J. Lantrip. "Soil structure effects associated with urbanization and the benefits of soil amendments." Presented at the *World Water and Environmental Resources Congress*. ASCE/EWRI. Anchorage, Alaska. May 2005.
- Clark, S., M.M. Lalor, and R. Pitt. "Wet-weather pollution from commonly-used building materials." Presented at the *World Water and Environmental Resources Congress*. ASCE/EWRI. Anchorage, Alaska. May 2005.
- Pratap, M., U. Khambhammettu, S. Clark, and R. Pitt. "Stormwater treatment using upflow filters." Presented at the *World Water and Environmental Resources Congress*. ASCE/EWRI. Anchorage, Alaska. May 2005.
- Morquecho, R. and R. Pitt. "Chemical forms and effects of heavy metals in stormwater." Presented at the *World Water and Environmental Resources Congress*. ASCE/EWRI. Anchorage, Alaska. May 2005.
- Maestre, A. and R. Pitt. "Observations from the National Stormwater Quality Database." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 24 and 25, 2005.

- Nara, Y., R. Pitt, S.R. Durrans, and J. Kirby. "The use of grass swales as a stormwater control." Presented at the *Conference on Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc., Toronto. February 24 and 25, 2005.
- Pitt, R. "Review of current wet weather research being conducted at the University of Alabama." Presented at the *Auckland Regional Council Stormwater Research Symposium*. Auckland, New Zealand. Oct. 21-22, 2004. (invited)
- Pitt, R. and A. Maestre. "The National Stormwater Quality Database." Presented at the *Stormwater Management Research Symposium*. University of Central Florida, Stormwater Management Academy. Orlando, FL, Oct. 12, 2004. (invited)
- Pitt, R., S. Chaturvedula, Y. Nara. "Source verification of inappropriate discharges to storm drainage systems." Presented at the *77th Annual Water Environment Federation Technical Exposition and Conference*. New Orleans, LA. Oct 4 – 7, 2004.
- Pratap, M., S. Clark, R. Pitt, and P. Johnson. "WERF: Evaluation of upflow filtration for stormwater treatment at critical source areas." Presented at the *77th Annual Water Environment Federation Technical Exposition and Conference*. New Orleans, LA. Oct 4 – 7, 2004.
- Shergill, S. and R. Pitt. "Quantification of *Escherichia coli* and enterococci levels in wet weather and dry weather flows." Presented at the *77th Annual Water Environment Federation Technical Exposition and Conference*. New Orleans, LA. Oct 4 – 7, 2004.
- Pitt, R. "The National Stormwater Quality Database." Presented at the *Stormwater Management Symposium*. Orlando, FL, Oct. 12, 2004. (invited)
- Pitt, R. and J. Voorhees. "The use of WinSLAMM to evaluate the benefits of low impact development." Keynote Address presented at the *Low Impact Development Conference: Putting the LID on SWM*. College Park, MD. Sept. 21-23, 2004. (invited)
- Pitt, R. and S. Chen. "Land development effects on soil structure and the use of soil amendments." Presented at the *Low Impact Development Conference: Putting the LID on SWM*. College Park, MD. Sept. 21-23, 2004. (invited)
- Pitt, R. "Monitoring the effects of urbanization." Presented at the *Aquatic Restoration Workshop 2004*. Mobile River Basin Coalition. Birmingham, AL. Aug. 24 and 25, 2004. (invited)
- Pitt, R., A. Maestre, and R. Morquecho. "Stormwater characteristics as contained in the nationwide MS4 stormwater phase 1 database." Presented at the *Water World and Environmental Resources Conference 2004*, Environmental and Water Resources Institute of the American Society of Civil Engineers, Salt Lake City, Utah. July 27 – August 1, 2004.
- Pitt, R., S. Clark, P.D. Johnson, R. Morquecho, S. Gill, and M. Pratap. "High level treatment of stormwater heavy metals." Presented at the *Water World and Environmental Resources Conference 2004*, Environmental and Water Resources Institute of the American Society of Civil Engineers, Salt Lake City, Utah. July 27 – August 1, 2004.
- Pitt, R. and R. Field. "Catchbasins and inserts for the control of gross solids and conventional stormwater pollutants." Presented at the *Water World and Environmental Resources Conference 2004*, Environmental and Water Resources Institute of the American Society of Civil Engineers, Salt Lake City, Utah. July 27 – August 1, 2004.
- Pitt, R., R. Bannerman, and R. Sutherland. "The role of street cleaning in stormwater management." Presented at the *Water World and Environmental Resources Conference 2004*, Environmental and Water Resources Institute of the American Society of Civil Engineers, Salt Lake City, Utah. July 27 – August 1, 2004.
- Pitt, R., S. Clark, P.D. Johnson, R. Morquecho, and D. Williamson. "Treatability of stormwater heavy metals; or breaking the irreducible concentration barrier." Presented at *Watershed 2004*, Water Environment Foundation. Dearborn, MI. July 11 – 14, 2004. (invited)
- Pitt, R., A. Maestre, and R. Morquecho. "Nationwide MS4 stormwater phase 1 database." Presented at *Watershed 2004*, Water Environment Foundation. Dearborn, MI. July 11 – 14, 2004. (invited)
- Clark, S.E., P.D. Johnson, S. Gill, M. Pratap. "Recent measurements of heavy metal removals using stormwater filters." Presented at *Watershed 2004*, Water Environment Foundation. Dearborn, MI. July 11 – 14, 2004.
- Pitt, R. "The status of stormwater quality: What we have learned in the past few years." Keynote presentation. Presented at *Stormwater: Emerging Issues for Local Communities*. US EPA, Region IV and the North Carolina Dept. of Environmental Management. Asheville, North Carolina. April 19-22, 2004. (invited)
- Pitt, R. *Degradation of Urban Streams and Integrated Sampling Programs to Identify Possible Causative Factors*, Featured Keynote Speaker. Presented at the *Freshwater Mollusk Conservation Society and Water Quality and Freshwater Gastropod Workshop*. Tuscaloosa, AL. March 2004. (invited)

- Maestre, A., R. Pitt, S.R. Durrans, and S. Chakraborti. "Stormwater quality descriptions using the three parameter lognormal distribution." Presented at the *Stormwater and Urban Water Systems Modeling Conference*. Computational Hydraulics, Inc. Toronto. February 19-29, 2004.
- Pitt, R., D. Williamson, and R. Bannerman. "Sources of pollutants in urban areas." Presented at the *Stormwater and Urban Water Systems Modeling Conference*. Computational Hydraulics, Inc. Toronto. February 19-29, 2004.
- Pitt, R., D. Williamson, and J. Voorhees. "Review of historical street dust and dirt accumulation and washoff data." Presented at the *Stormwater and Urban Water Systems Modeling Conference*. Computational Hydraulics, Inc. Toronto. February 19-29, 2004.
- Pitt, R. "Modeling stormwater controls in complex drainages." Invited Feature Speaker. Presented at the *Designing Sites for Water Quality: Active Construction & Post-Construction BMPs*. Michigan Water Environment Association. Battle Creek, MI. Dec 2 – 3, 2003. (invited)
- Clark, S.E., P. Johnson, R. Pitt. "Metals removal technologies for stormwater: Filtration." Presented at the *2003 Pennsylvania Stormwater Management Symposium*. Villanova, October 16-17, 2003.
- Pitt, R., A. Maestre and R. Morquecho. "Compilation and review of nationwide MS4 stormwater quality data." Presented at the *76th Annual Water Environment Federation Technical Exposition and Conference*. Los Angeles, CA. Oct 11 – 15, 2003.
- Pitt, R. and S. Clark. "Stormwater treatment at critical source areas: The Multi-Chambered Treatment Train (MCTT) and new upflow filters." Presented at the *76th Annual Water Environment Federation Technical Exposition and Conference*. Los Angeles, CA. Oct 11 – 15, 2003.
- Morquecho, R. and R. Pitt. "Stormwater heavy metal particulate associations." Presented at the *76th Annual Water Environment Federation Technical Exposition and Conference*. Los Angeles, CA. Oct 11 – 15, 2003.
- Pitt, R. "Urban sprawl: What we know and don't think about." Invited Keynote Address. Presented at the *Society of Woman Engineers 2003 National Conference*, Birmingham, AL. Oct 9 – 11, 2003.(invited)
- Pitt, R. "Stormwater quality database representing long-term U.S. regulatory monitoring: Do we know enough yet and can get on with it?" Invited Keynote Address. Presented at the *3rd South Pacific Conference on Stormwater*. Auckland Regional Council, New Zealand. May 14-16, 2003. (invited)
- Pitt, R. "Innovative metal control using grass swales and stormwater filters." Presented at the *3rd South Pacific Conference on Stormwater*. Auckland Regional Council, New Zealand. May 14-16, 2003. (invited)
- Pitt, R. "Overview of national stormwater needs and priorities." Invited Keynote Address. Presented at the *A National Stormwater Laboratory: Needs, Priorities and Funding*. University of Minnesota, Minneapolis, MN. May 1 – 2, 2003. (invited)
- Johnson, P.D., S. Clark, R. Pitt, S.R. Durrans, M. Urrutia, S. Gill, and J. Kirby. "Metals removal technologies for stormwater." Presented at the *9th Industrial Wastes Technical Conference*. Austin, TX. Water Environment Foundation. April 16, 2003.
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- Pitt, R. "Land use features benefiting stormwater management." Presented at the *ACS Regional Conference: Campus as a Laboratory for Sustainability*. Birmingham Southern College. October 25-27, 2002. (invited)

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- Burian, S.J., S.J. Nix, S.R. Durrans, and R.E. Pitt. "Analysis of the long-term performance of storage/release systems using linked watershed-water body modeling." Presented at the 9th *International Conference on Urban Drainage*. IAHR, IWA, EWRI, and ASCE. Portland, Oregon, September 8-13, 2002.
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- Pitt, R. "Stormwater treatment at critical source areas using the multi-chambered treatment train (MCTT)." Presented at the *2002 Borchardt Conference, A Seminar on Advancements in Water and Wastewater*. The University of Michigan, Ann Arbor, Feb. 2002. (invited)
- Pitt, R. C. Shen-En Chen, S. Clark, J. Lantrip, and C.K. Ong. "Infiltration through compacted urban soils and effects on biofiltration design." Presented at *Stormwater and Urban Water Systems Modeling*. Computational Hydraulics, Inc. Toronto, Canada, Feb. 2002.
- Pitt, R. "Stormwater control practices in cold climates." Presented at the *Stormwater Runoff in Vermont: An Educational Workshop*. Vermont Water Resources and Lake Studies Center, UVM and the Vermont Law School. Burlington, VT, Jan. 2002. (invited)
- Pitt, R. "Source tracking." NWRI, Presented at the *National Urban Watershed Conference*. Costa Mesa, CA, Oct. 2001. (invited)
- Pitt, R., S. Clark, and P. Brown. "Modeling of particulate removal in mixed media filters using power equation." Presented at Water Environmental Federation, *WEFTEC'01*. Atlanta, GA, Oct. 2001.
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- Pitt, R. "Source water protection." Presented at the *ALMS AWWA Conference*. Biloxi. MS. Oct. 2001.
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- Pitt, R. "Small storm hydrology: Its importance for the design of stormwater control." Presented at the *5th New York Stormwater Management Conference and Trade Exposition*. Rochester, NY. Feb., 1999. (invited)
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- Pitt, R. and R. Field. "Water Quality Effects of Urban Runoff," Presented at the *94th Annual AWWA Conference*, Boston, MA, 1975.

Selected Older Research Reports

- DETPOND 4: A Water Quality Detention Pond Design Program; Model Documentation and Users Manual*. Wisconsin Department of Natural Resources, May 1989.
- Construction Site Erosion Control Manual*, Water Works Board for the City of Birmingham, April 1989.
- Characterization and Control of Storm Water Pollution; Source Loading and Management Model (SLAMM): Volume I: Model Development and Summary*. Wisconsin Department of Natural Resources, March 1989.
- SLAMM: Volume II: Model Documentation*; Wisconsin Department of Natural Resources, March 1989.

Birmingham Watershed Protection Ordinance, Water Works Board for the City of Birmingham (AL), December 1988.

State Plan for the Control of Construction Site Erosion and Stormwater Runoff, Wisconsin Department of Natural Resources, July 1987.

Manual of Practice for Stormwater Controls, Wisconsin Department of Natural Resources, 1987.

Model Ordinance for the Control of Construction Site and Stormwater Runoff, Wisconsin Department of Natural Resources, October 1986.

Snowmelt as a Pollutant Source, Ontario Ministry of the Environment, Toronto, Canada, January 1986.

Particulate Accumulation and Washoff Relationships - Modifications to the HSPF Model, Ontario Ministry of the Environment, Toronto, Canada, June 1984.

Washoe County Urban Stormwater Management Program, Washoe Council of Governments, Reno, NV, August 1982.

Lake Merritt Management Plan, City of Oakland, CA, Department of Public Works, May 1979.

Water Quality Study for Pittsburgh Power Plant Units 8 and 9, for the Pacific Gas and Electric Company (West Pittsburgh, California), 1978.

Oil Spill Movement Study, for the Port of Long Beach (San Pedro Bay, California), 1978.

Red Desert Uranium Mine and Mill, for Minerals Exploration Company (Sweetwater County, Wyoming), 1978.

Recommended Measures for the Control of Surface Runoff, Alameda County Flood Control and Water Conservation District, September 1977.

Water Quality and Biological Consulting Services Concerning Sewage Treatment Discharge Effects on Alaskan Tundra Ponds, Atlantic Richfield Company (Prudhoe Bay, Alaska), 1977.

Hazardous Material Contingency Plan for a Chemical Facility, for Allied Chemical Corporation (Pittsburg, California), 1977.

Ute Mountain Uranium Exploration Activities, for Mobil Oil Corporation (Montezuma County, Colorado), 1977.

Geothermal Resources Studies, for the Phillips Petroleum Company (Roosevelt Hot Springs, Utah), 1977.

Review of the Sun Desert Nuclear Power Plant Environmental Report, for the San Diego Gas and Electric Company, 1976.

Water Quality Investigations for Nuclear Notices of Intent, for the Pacific Gas and Electric Company (Stanislaus, Merced, and Madera Counties, California), 1976.

Crow Indian Reservation Coal Mining Lease, for Shell Oil Company (Big Horn County, Montana), 1976.

Water Quality and Biological Survey of the Zeyandeh Rud near Isfahan, Iran, for E. I. duPont de Nemours Company, 1976.

The Effects of Sand and Gravel Removal on Arctic and Subarctic Streams, for the U. S. Fish and Wildlife Service (Alaska), 1976.

Engineering Report for Air Quality Mitigation Measures, for the Southern California Gas Company, 1975.

Air Quality Effects of Oil Spills, Standard Oil Company of California (Santa Barbara), 1975.

Contingency Plan for a Proposed Ammonia and Urea Transfer and Storage Facility, for Collier Carbon and Chemical Corporation (Sacramento, California), 1975.

Environmental Effects of a Possible Oil Spill at Morro Bay, for the Pacific Gas and Electric Company (Morro Bay, California), 1974.

Twin Creek Coal Mine, for the Rocky Mountain Energy Company (Lincoln County, Wyoming), 1974.

Monitoring of Oil Spill Waste Disposal Areas, for Standard Oil Company of California (San Francisco), 1973.

Oakland Airport Maintenance Facility Expansion, for the Port of Oakland (California), 1973.

Environmental, Social, and Economic Impact of the Proposed 1972-1977 Capital Improvement Program for the San Jose Municipal Airport, for the City of San Jose (California), 1972.

Industrial Waste Survey of the Northwest Fruit and Vegetable Canning Industry, for the Environmental Protection Agency (Washington, Oregon, and Idaho), 1972.

Oil Spill/Sorbent Harvesting Systems on Vessels of Opportunity, A motion picture, U.S. Environmental Agency, 1972.

Department of Civil, Construction, and Environmental Engineering Courses Taught:

CE 333 - Water Supply and Drainage Design

CE 335 - Water and Wastewater Treatment

CE 378 – Water Resources Engineering

<http://unix.eng.ua.edu/~rpitt/Class/Water%20Resources%20Engineering/WREMainPage.htm>

CE 401/402 – Civil Engineering Site Development Senior Design Project

<http://unix.eng.ua.edu/~rpitt/Class/Senior%20Design/linked%20senior%20design.htm>
 CE 435 - Environmental Engineering
 CE 484 - Hydraulic Engineering Systems
 CE 485 - Engineering Hydrology
 CE 499 - Senior Design
 CE 527 Urban Water Systems
<http://unix.eng.ua.edu/~rpitt/Class/Computerapplications/MainCA.html>
 CE 544 - Engineering Statistical Analyses
 CE 636 - Stormwater Management
<http://unix.eng.ua.edu/~rpitt/Class/StormWaterManagement/MainSWM.html>
 CE 637 - Experimental Design and Field Sampling
<http://unix.eng.ua.edu/~rpitt/Class/ExperimentalDesignFieldSampling/MainEDFS.html>
 CE 638 - Chemical Processes and Pollutant Impacts in Water
 CE 485/685 – Construction Site Erosion and Sediment Control
<http://unix.eng.ua.edu/~rpitt/Class/Computerapplications/Table.htm>
 CE 641 - Environmental Engineering and Water Resources Seminar
 CE 685 - Research Methods in Civil and Environmental Engineering
 CE 687 - Stormwater Detention Pond Design
<http://unix.eng.ua.edu/~rpitt/Class/Detentionponddesign/MainDPD.html>
 CE 690 – Effects and Fates of Hazardous Materials
<http://unix.eng.ua.edu/~rpitt/Class/EffectsandFates/MainEffectsandFates.html>
 CE 690 - International Internet based courses on Stormwater Modeling and Stormwater Management
 CE 691 –Internet based course on International Urban Water Systems
<http://unix.eng.ua.edu/~rpitt/Class/International%20urban%20water%20systems/IUWSMainPage.htm>
 HON 101-406 - Honors course: The Environment: The Earth in Our Shadow
 HON 107/407 - Honors course: The Environment: Earth, Air, Fire, and Water

Major Advisor for Graduate Students:

Agnew, Frank. MSCE. *Performance of Inlet Treatment Devices*. 1996.
 Alfaqih, Laith. Ph.D., *Application of Environmental Decision Analysis Framework on the E. Coli Problem in Lake Tuscaloosa Watershed*. 2008.
 Avila, Humberto. Ph.D. *Scour of Captured Sediment from a Stormwater Hydrodynamic Device*. 2008.
 Ayyoubi, Ali. MSCE. *Physical Treatment of Urban Storm Water Runoff Toxicants* (published thesis). 1993.
 Baker, Martin, R. III. MSCE. *Constructed Wetlands for the Treatment of Paper Mill Wastes*. 2001.
 Balakrishnan, Anitha C. MSCE. *Comparison of Upflow and Downflow Filtration on Clogging and Pollutant Removal Capabilities of Stormwater Filters*. 2001.
 Barron, Patricia. MSCE. *Characterization of Polynuclear Aromatic Hydrocarbons in Urban Runoff* (published thesis). 1990.
 Bathi, Jejal. Ph.D. *Associations of Polycyclic Aromatic Hydrocarbons (PAHs) with Urban Stream Sediments*. 2008.
 Bochis, Elena-Celina. MSCE. *Magnitude of Impervious Surfaces in Urban Areas* (published thesis). 2007.
 Bochis, Elena-Celina. Ph.D. *Characteristics of Urban Development and Associated Stormwater Quality*. 2010.
 Buford, Mark. MSCE. *Land Use Characteristics Affecting Baseflow Quality*. 1995.
 Burnett, David. MSCE. *Snowmelt Water Quality*. 1997.
 Cai, Yezhao. MSCE. *Full-Scale Up-Flo® Stormwater Filter Field Performance Verification Tests* (published thesis). 2013.
 Chaturvedula, Soumya. MSCE. *Watershed Investigation for the Identification of Sources of Inappropriate Discharges to the Cribbs Mill Creek* (published thesis). 2004.
 Clark, Shirley. MSCE. *Evaluation of Filtration Media for Stormwater Runoff Treatment* (published thesis). 1996.
 Clark, Shirley. Ph.D. *Urban Stormwater Filtration/Sorption: Optimization of Design Parameters and a Pilot-Scale Evaluation*. 2000.
 Creel, Robert. MSCE. *Evaluating Detention Pond Performance with Computer Modeling Verification* (published thesis). 1994.
 Day, James. MSCE. *Selection of Appropriate Analytical Procedures for Volunteer Field Monitoring of Water Quality* (published thesis). 1996.
 Delawadia, Naran. MSCE. *Validation of the DETPOND Model*. 1996.
 Dykes, William C. MSCE. *Water Pipeline Networks*. 1989.

Echols, W.C. MSCE. *Calibration and Performance of Micro-Scale Peepers for High-Resolution Interstitial Water Sampling*. 1997.

El-Husari, Ayman. MSCE. *Rain Monitoring Options*. 1996.

Ellis, April. MSCE. *The use of Peepers to Measure Bacteria and Nutrient Gradients in Urban Pond Sediments*, 1998.

Eppakayala, Vijay. MSE. *A Review of Fate, Treatability, and Analysis of Emerging Contaminants in Wet Weather Flows*. 2008.

Farmer, Joseph. MSCE. *Oil and Grease Separators for Stormwater Control*. 1997.

Garrett, William. MSCE. *Control of Zebra Mussels in Power Plant Cooling Water Systems*. 1995.

Garrett, William. Ph.D. *Recirculating – Reducing and Alkalinity Producing System (RERAPS) for the Treatment of Acidic Coal Pile Runoff*. 2002.

Goertz, Susan. MSCE. *Runoff Quality from a Xeroscaped Area*. 1996.

Goodson, Kenya. Ph.D. *Treatability of Emerging Contaminants in Wastewater Treatment Plants during Wet Weather*. 2013.

Hamrick, James. MSCE. *Drainage of Water from Pavement Structures* (published thesis). 1995.

Hardin, John. Ph.D. *Retardance of Rainwater-Leached Metals from CCA-Treated (Chromated Copper Aresenate) Wood Ash in Soil*. 2011.

Hosmer, Carla. MSCE. *Behavior of Stormwater Filtration Media under Aerobic and Anaerobic Conditions*, 2000.

Howser, John. MSCE. *Performance of Stormwater Detention Practices*. 1995.

Hyche, Hunter. MSCE. *Extensions to the National Stormwater Quality Database* (published thesis), 2007.

Karri, Verra. MSCE. *Monte Carlo Mixing Model to Identify Inappropriate Discharges to Storm Drainage Systems* (published thesis). 2004.

Khan, Mustaque. MSCE. *Organic Compound Automated Extraction Methods for Sediments*, 1999.

Kemp, Randall. MSCE. *Demonstration of Erosion Control Practices*. 1995.

Khambhammettu, Uday. MSCE. *Evaluation of Upflow Filtration for the Treatment of Stormwater* (published thesis). 2005.

Lalor, Melinda. Ph.D. (Vanderbilt Univ.) *Assessment of Non-Stormwater Discharges to Storm Drainage Systems in Residential and Commercial Land Use Areas*. 1993.

Lantrip, Janice. MSCE. *Infiltration through Disturbed Urban Soils*. 1999.

Lilburn, Melissa. MSCE. *Storm Drainage Design Practices* (published thesis). 1997.

Maestre, Alex. Ph.D. *Stormwater Characteristics as Described in the National Stormwater Quality Database*. 2005.

Michaels, Kimberly. MSE (Environmental). *Presence of Emerging Contaminants in Wet Weather Flows*. 2009.

Morquecho, Renee. MSCE. *Sequential Extraction and Particle Size Associations for Stormwater Pollutants*. 2001.

Morquecho, Renee. Ph.D. *Pollutant Associations with Particulates in Stormwater*. 2005.

McConnel, Vic. MSCE. *Design of Detention Ponds for Commercial Development*. 1997.

McGill, Milan. MSCE. *Rainfall Distribution Analysis Options*. 1996.

McKell, Mitch. MSCE. *New Concepts in Wastewater Effluent Diffuser Design*. 1994.

Nara, Yukio. MSCE. *Sediment Transport in Grass Swales* (published thesis). 2005.

Narayanan, Arvind. MSCE. *Costs of Urban Stormwater Control Practices* (published thesis). August 2006.

Nelson, John. MSCE. *Characterizing Erosion Processes and Sediment Yields on Construction Sites* (published thesis). 1996.

Nix, Christy, M. MSCE. *Evaluation and Calibration of the Pastel UV for Detecting Sewage in Storm Water Drainage Systems*. 1999.

Nolen, Bobby. MSCE. *Hydraulic Models of the Transition Section of Laurel Lake Spillway*. 1989.

Ogburn, Olga. Ph.D. *Urban Stormwater Contamination Associated with Gutter and Pipe Material Degradation*. 2013.

Panwhar, Samina. MSCE. *An Application of a GIS System for Risk Analysis and Routing of Hazardous Materials* (published thesis). 2001.

Peebles, Alan. MSCE. *Comparison of Rainfall Depth Calculation Procedures*. 1995.

Ponstein, Jonathan. MSCE. *Sources and Control of Tastes and Odors in a Public Water Supply*. 2001

Ray, Holly. MSCE. *Street Dirt as a Phosphorus Source in Urban Stormwater* (published thesis). 1997.

Revell, Edwin. MSCE. *Rainfall Measurements using Radar Systems*. 1995.

Richards, Michael. MSCE. *Arsenic Remediation Practices*. 1995.

Roberts, Timothy. MSCE. *Organochlorine Pesticide Detection Using a Compositing Scheme*. 1999.

Robertson, Brian. MSCE. *Evaluation of a Multi-Chambered Treatment Train (MCTT) for Treatment of Stormwater Runoff from Critical Pollutant Source Areas* (published thesis). 1995.

Shergill, Sumandeep. MSCE. *Quantification of Escherichia Coli and Enterococci Levels Wet Weather and Dry Weather Flows* (published thesis). 2004.

Sileshi, Redahegn. Ph.D. *Soil Physical Characteristics Related to Failure of Stormwater Bioinfiltration Devices*. 2013.

Summers, Harry. MSCE. *Upgrading of a Small Municipal Wastewater Treatment System*. 1991.

Talebi, Leila. Ph.D. *Assessment of Integrated Green Infrastructure-Based Stormwater Controls in Small to Large Scale Developed Urban Watersheds*. 2014.

Togawa, Noboru. Ph.D. *Upflow Filtration Treatment of Stormwater*. 2011.

Usha, Sree. MSCE, *PAH Releases from Aging Asphaltic Pavement*. 2011.

Weygand, Kenneth. MSCE. *Current Practices in Hydraulic Modeling*. 1996.

Wilson, Robert. MSCE. *Effluent Nitrate Reduction in Onsite Systems through Effluent Recycle* (published thesis). 1992.

Engineering Professional Development Courses and Workshops Taught:

Stormwater Management: and Conservation Design	Albany, NY, 2000, 2008 Appleton, WI, 2005 Aurora, CO, 2008, 2009 Baltimore, MD, 2011- 2013 Birmingham, AL, 1989 - 1998 Boston, MA, 1993 Chicago, IL, 1992, 1993, 1998 Denver, CO, 2014 Edison, NJ, 2001, 2003, 2008, 2010 Essen, Germany, 1994 Fair Hope, AL, 1995, 1997 Fishkill, NY, 2002 – 2004, 2007 Guelph, Ontario, 1995 Harrisburg, PA, 2011-2014 Huntsville, AL, 1999 Los Angeles, CA, 2011 Las Vegas, NV, 2001, 2003 Madison, WI, 1991 - 2014 Milwaukee, WI, 1990, 1999 Minneapolis, MN, 2005, 2007 Montgomery, AL, 1999, 2000 Niceville, FL, 2006 Portland, OR, 1989, 1992 Portland, ME, 1994, 2014 San Antonio, TX, 2010 San Francisco, CA, 2010 Seattle and Olympia, WA, 2003 Singapore, 1991 Sydney, Australia, 2010 Syracuse, NY, 2002, 2003 St. Paul, MN, 1993, 2013 Trenton, NJ, 2012 Vancouver, BC, 2003
Green Infrastructure and CSO control:	Edison, NJ, 2010 Exeter, UK, 2011 Kansas City, 2007 Shanghai, China, 2009
Bioretention Control Practices:	Birmingham, AL, 1993 – 1995 Madison, WI, 2005 – 2007

Construction Site Erosion Control: Birmingham, AL, 1989 – 2005
Guntersville, AL, 2003
Mobile, AL 2003, 2005

Detention Pond Design: Birmingham, AL, 1989 - 1997
Boston, MA, 1993
Chicago, IL, 1998
Edison, NJ, 2001, 2003
Fishkill, NY, 2002, 2004, 2006, 2007
Guelph, Ontario, 1995
Las Vegas, NV, 2001, 2003
Madison, WI, 1991 – 2006
New York City, 2001
Portland, OR, 1993
Portland, ME, 1994
Rochester, NY, 2001
Syracuse, NY, 2001
St. Paul, MN, 1993 - 1998

PE Exam Review: Birmingham, AL, 1988 - 1993
FE Exam Review: Tuscaloosa, AL, 2002

University Committee Assignments and other Intramural Activities:

School of Engineering Service:

Tenure and Promotion Committee for Department and COE
Review Committee for Tenure and Promotion Procedures for COE
ABET Accreditation Committee
Computer Network Committee
Strategic Planning Committee
Faculty Affairs Committee
Academic Misconduct Advisory Panel
Nonacademic Discipline Committee
Selected speaker for 1999 UAB Day for prospective engineering students
EGR100 Pre-College Summer Program keynote speaker, 1990
Selection committee for Presidential Award for Excellence in Teaching
Faculty advisor to student chapter of the American Water Resources Association (joint with Univ. of Alabama, Tuscaloosa and UAB campuses) (first place national chapter for 1997)
Faculty advisor to student chapter of the Water Environment Federation
Graduate Program Committee Chair

University Service:

Director, Environmental Institute, UA, 2004 – 2013.
Research Grants Committee, UA, 2006 – 2012.
Institutional Biological Safety Committee, UA, 2004 – 2009.
Developed new Departmental Honors Program, UAB, approved February 1999.
Developed new Ph.D. program in Environmental Health Engineering, UAB, approved December 1996.
UAB Honors Council, 1997 – 2002.
UAB Faculty Senate, 1996 - 1997.
9 and 12 Month Conversion Committee, 1996.
Graduate Student Research Day Committee, 1996.
EARTH Center Executive Board, 1994 - 1995.
Center for Telecommunications, Director of Environmental Factors, UAB, 1994 - 2001.
Southern Association of Colleges and Schools Self-Study accreditation committee for professional and graduate schools, 1993.
Minority Initiative for High School Students Program mentor, 1992 – 1997.
UAB Summer Research Program mentor, 1995 – 2001.

Howard University/NIOSH/MOTTEP Program mentor, 2000.
National Institute of Health Summer Program mentor, 1996, 2000, 2001.
Coca-Cola Summer Scholars program mentor, 1993 – 1995.
Chemical Safety Committee, 1993 – 1996.
EPSCoR statewide Energy and the Environment Director, 1992 - 1994.
Teacher Education Council (School of Education), 1990 - 2001.
Task Force on Quality of Teaching, School of Arts and Humanities, 1994.
Environmental Education Committee, 1990 - 2001.
Summer Scholar Program mentor, 1990.