

Philip B. Bedient, Ph.D., P.E.
Curriculum Vitae

ADDRESS:

Herman Brown Professor of Engineering
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EDUCATION:

B.S. Physics, University of Florida, Gainesville, Florida, 1969
M.S. Environmental Engineering, University of Florida, 1972
Ph.D. Environmental Engineering Sciences, University of Florida, 1975

PROFESSIONAL EXPERIENCE:

Herman Brown Professor of Engineering - Civil and Environmental Engineering- Rice University - July 2001 to present.
Professor - Environmental Engineering - Rice University - 1986 to 2001.
Professor and Chair - Department of Environmental Science and Engineering, Rice University, Houston, Texas, 1992 - 1999.
Associate Professor - Environmental Engineering – 1980 - 1986.
Assistant Professor - Environmental Engineering – 1975 - 1980.

SCIENTIFIC SOCIETIES:

American Society of Civil Engineers
American Institute of Hydrology
American Water Resources Association
Association of Environmental Engineering Professors
American Academy of Water Resources Engineers
American Geophysical Union

HONORS:

Diplomate - Water Resources Engineer, American Academy of Water Resources Engineers (2008)
C.V. Theis Award from the American Institute of Hydrology (April 2007)
Fellow – American Society of Civil Engineers (April, 2006)
Endowed Chair – Herman Brown Professor in Engineering (July, 2001)
Shell Distinguished Chair in Environmental Science (1988-93)
Phi Beta Kappa

PROFESSIONAL COMMITTEES:

SSPEED Center Committee 2007-2014
Expert Panel – “Impacts of Climate Change on Transportation Systems and Infrastructure in the Gulf Coast” USDOT and USGS, 2005 - 2006
TS Allison Recovery Project - Technical Advisory Committee - 2002-2003
Harris County Flood Control District - Brays Bayou Federal Project Com – 1998- 2002

National Academy of Engineers (National Research Council)
 Committee on DoE Environmental Management Technologies (CEMT) - 1995-96
 Committee on In-Situ Bioremediation - 1992-93

UNIVERSITY COMMITTEES:

Undergraduate Curriculum Committee, 2005-2012
 Accreditation (ABET/SACS) Committee, 2005-2012
 Events and Reception Committee (Chair) 2012
 Mentorship Committee 2012
 Space Planning Committee, 2005-2012
 CEE Student-Group Advisors 2012
 BSCE Advisor 2012
 Center for Civic Engagement Committee, 2007-2012
 Parking Committee, 1998-2012
 Search Committee, Civil and Environmental Engineering, (2001-2002)
 Chair, Dean of Engineering Search Committee, (1988)
 Computer Committee, Athletics Committee, 1998-2000
 Advisory Council, School of Engineering,

LICENSES:

Professional Engineer, State of Texas, Environmental Engineering (45626)
 Professional Hydrologist, American Institute of Hydrology

RESEARCH INTERESTS:

Flood & Surge Mitigation As the director of the Severe Storm Prediction Center (SSPEED) at Rice University (since 2007) Dr. Bedient leads a team of five universities and 15 investigators from Gulf Coast universities dedicated to improving storm prediction, education, and evacuation from disaster. The Center was approved by the Texas Legislature and has been funded at over \$8.0 million for 8 years from the Houston Endowment (Hurricane Ike Lessons Learned and Future Steps). A book, "Lessons from Hurricane Ike" was published by TAMU press in June 2012. The SSPEED Center has taken a unique approach to surge mitigation by addressing in bay residual surge impacts related to hurricanes in the Gulf.

Flood Alert Systems with Radar - The development of a real-time flood ALERT system (FAS3) for Brays Bayou and the Texas Medical Center in Houston, TX has been completed. The FAS3 currently uses NEXRAD radar for application to flood prediction and real-time flood alert systems. TMC, FEMA, and TXDOT funded FAS improvements from 1998 thru 2010. Analysis of the severe storm impacts in urban watershed areas has been completed using radar rainfall data, combined with GIS techniques for digital terrain and hydraulic modeling in Houston and other coastal areas in Texas.

Groundwater Contaminant Transport - Monitoring and modeling of groundwater hydrology and contaminant movement from various waste sources, numerical and analytical methods for transport with biodegradation. Development and application of tracer studies and models for groundwater transport with biodegradation in a controlled release tank (ECSR), for studying degradation of PCE and TCE plumes and for ethanol in fuel spills. Analysis of plume dynamics at sites in California, Texas and Florida.

Hazardous Waste Site Evaluation - Monitoring and modeling of waste plumes associated with 35 hazardous waste sites nationally. Identification of extent of contamination, transport mechanisms,

and control strategies. MODFLOW and RT3D modeling of transport and aquifer restoration using withdrawal-treatment and microbial degradation methods. Analysis of hazardous waste sites in California, Texas and Florida.

COURSES and STUDENTS:

- CEVE 412 - Hydrology and Watershed Analysis
- CEVE 512 - Hydrologic Design Laboratory
- CEVE 101 - Fundamentals of Civil and Environmental Engineering
- CEVE 415/515 - Water Resources Planning and Management (50%)
- 13 Ph.D. and 60 M.S. degrees since 1975

RESEARCH STATEMENT:

Dr. Philip B. Bedient is also Herman Brown Professor of Engineering in the Dept of Civil and Environmental Engineering at Rice University. He teaches and performs research in surface and ground water hydrology, disaster management, and flood prediction systems. He served as Chair of Environmental Engineering from 1992 to 1999. He has directed 60 research projects over the past 36 years, has written over 180 articles in journals and conference proceedings. He is lead author on a text on "Hydrology and Floodplain Analysis" (Prentice Hall, 5th ed., 2012) used in over 75 universities across the U.S. Dr. Bedient received the Herman Brown endowed Chair of Engineering in 2002 at Rice University. He was elected to Fellow ASCE in 2006 and received the prestigious C.V. Theis Award from the American Institute of Hydrology in 2007. He earlier received the Shell Distinguished Chair in Environmental Science (1988 to 1993).

He is the director of the Severe Storm Prediction Center (SSPEED) at Rice University (since 2007) consisting of a team of seven universities and 15 investigators from Gulf coast universities dedicated to improving storm prediction, education, and evacuation from disaster. The Center was approved by the Texas Legislature and is currently funded by the Houston Endowment (Hurricane Ike Lessons Learned and Future Steps). A book has been developed and published by TAMU press titled "Lessons from Hurricane Ike" published in June 2012. The SSPEED Center has taken a zone approach to developing mitigation strategies and has identified four zones of interest in the Houston-Galveston region: the Houston Ship Channel, West Bayshore, Galveston Island and a Coastal Recreation Area.

Dr. Bedient has over 37 years of experience working on flood and flood prediction problems in the U.S. He has evaluated flood issues in Texas, California, Florida, Louisiana, and Tennessee. He has worked on some of the largest and most devastating floods to hit the U.S. including the San Jacinto River flood of 1994, T.S. Frances in 1998, T.S. Allison in 2001, Hurricane Katrina in 2005, Hurricane Rita in 2005, Hurricane Ike in 2008, and the Nashville, TN flood of 2010. He routinely runs computer models such as HEC-HMS, HEC-RAS, SWMM, and VFLO for advanced hydrologic analysis. He developed one of the first radar based rainfall flood alert systems (FAS-3) in the U.S. for the Texas Medical Center.

The SSPEED Center has put on a number of conferences, meetings, and training courses since 2007. Prominent national speakers have been invited to these conferences, which include attendees from academia, industry, consulting, and emergency managers. These conferences provide a forum for public discussion and response for decision and policy makers, and stakeholders. As a result of this work, we have received a large number of Rice News stories over the past several years, in the form of both video interviews with the media as well as newspaper coverage.

Dr. Bedient has been involved in the technology transfer area for more than two decades through the teaching of short courses for government, university, and private sectors. He has recently organized five conferences on Severe Storm flooding and recovery projects in 2001, 2003, and 2005, 2006, and 2007 on the Rice University campus. In 2008 he organized a new major conference on "Severe Storms Prediction and Global Climate in the Gulf Coast" in October 2008 which hosted speakers who experienced first hand

the impacts of both hurricanes Katrina and Ike this past summer. More than 125 people attended on the Rice campus and the conference was highlighted with over 60 talks including the keynote from the director of the National Hurricane Center.

SURFACE WATER PROJECT

“SSPEED Center Proposal to the Houston Endowment 2014-2017”, Houston Endowment, \$3,200,000.

“SSPEED Center Proposal to the Houston Endowment Coastal Integrated”, Houston Endowment, 2011-2014, \$3,195,451

“FAS3- Operational Support”, Texas Medical Center, 2012-2015, \$96,000 per year for 3 years.

“Urban Resilience: Flooding in the Houston-Galveston Area”, Kinder. 2009-2012, \$240,003

“White Oak Bayou BMP Demonstration Project – Cottage Grove Subdivision”, City of Houston, 2009-2013, \$165,000.

“Residential Storm Surge Damage Assessment for Galveston County”, Texas General Land Office (GLO), 2012-2013, \$100,000

“Rice University FEMA: Food Analysis”, Rice, 2011-2012, \$70,000

“Amendment to Expand Development and Validation of the Online Storm Risk Calculator Tool for Public Usage”, City of Houston, 2011, \$388,030

“Hurricane Ike: Lessons Learned and Steps to the Future”, Houston Endowment, 2009-2012, \$1,250,000

“Libya AEL Training Grant”, AECOM, 2008-2010. \$1.7 million over 2 years.

“Texas OEM SSPEED Training” University of Texas, 2008, \$90,000

“Watershed Information Sensing and Evaluation System”. Houston Endowment (with UH), 2007-2010, \$400,000.

“Advanced Flood Alert System for the TXDOT for Bridge Control at 288”. HGAC, 2007-2011 \$200,000.

“Civil and Environmental Engineering for the 21st Century”. NSF Dept Reform Grant, 2005-2007, \$100,000.

“CASA – Collaborative Adaptive Sensing of the Atmosphere – the Houston Testbed”. NSF, 2003 – 2009, \$110,000, (\$90,000 for 2006-07).

“FAS2 - Operational Support”, Texas Medical Center, 2003-2012, \$69,000

“Flood Alert System (FAS2) for the Texas Medical Center and Brays Bayou”. FEMA, 2002-2003, \$300,000.

“Multi-Purpose Water Management Technology for the Texas Mexico Border”, Advanced Technology Program, 2000-2001, \$129,000.

“Analysis of Clear Creek Watershed,” Galveston Bay Preservation Foundation, 1999-2000, \$15,000.

“Flood Alert System - Maintenance and Support”. Texas Medical Center, 1998-2002, \$271,000.

“Flood Prediction System for the Texas Medical Center”. Texas Medical Center, 1997-1998, \$262,000.

“The Effects of Changing Water Quality and Market Inefficiencies on Water Resource Allocation in the Lower Rio Grande Valley”. Energy and Environmental Systems Institute, Rice University, 1996-1997, \$12,000.

"Characterization of Laguna Madre Contaminated Sediments", Environmental Protection Agency, 1995, \$68,500.

"Role of Particles in Mobilizing Hazardous Chemicals in Urban Runoff". Environmental Protection Agency, 1992-95, \$240,000. (P. B. Bedient, Co-P.I.).

"Galveston Bay Characterization Report", Galveston Bay National Estuary Program, 1991-1992, \$35,000.

"Characterization of Non-Point Sources and Loadings to Galveston Bay". Galveston Bay National Estuary Program, 1990-1991, \$125,000.

"Linkages between Sewage Treatment Plant Discharges, Lake Houston Water Quality, and Potable Water Supply during Storm Events". City of Houston, 1984-1985, \$42,200.

"Plan of Study for Upper Watershed Drainage Improvements and Flood Control - San Jacinto River Basin", subcontract from R. Wayne Smith, Engineer, 1984-85, \$120,260.

"Harris Gully Sub watershed Study", South Main Center Association, 1983-1984. \$15,000.

"Sedimentation and Nonpoint Source Study of Lake Houston". Houston-Galveston Area Council, 1981-1982, \$55,000.

"Environmental Study of the Lake Houston Watershed - Phase II", Houston-Galveston Area Council, 1980-1981, \$30,000.

"Evaluation of Effects of Storm water Detention in Urban Areas", matching grant with City of Houston Health Department, Office of Water Research and Technology (OWRT), Washington, D.C., and City of Houston Public Health Engineering, 1980-81, \$116,000.

"Environmental Management of the Lake Houston Watershed", Funded by City of Houston, Dept. of Public Health, 1978-80, \$80,000.

"A Preliminary Feasibility Report for Bear Creek, Texas, Local Protection Project", Grant to Southwest Center for Urban Research, Funded by U.S. Army Corps of Engineers, 1977-78, \$47,000.

"Environmental Study of New Iberia Navigation Port and Channel, Louisiana", Funded to Rice Center, 1979, \$50,000.

"Strategies for Flood Control on Cypress Creek, Texas", Funded by U.S. Corps of Engineers, Galveston, Texas, 1977, \$9,500.

"Water Quality Automatic Monitoring and Data Management Information System", Funded by City of Houston, Dept. of Public Health, 1977-1978, \$62,414.

"Maximum Utilization of Water Resources in a Planned Community", The Woodlands Project, 1975-1976.

GROUNDWATER PROJECTS

"A Large-Scale Experimental Investigation of the Impact of Ethanol on Groundwater Contamination", (P.J.J. Alvarez – Co-P.I.) American Petroleum Institute, 2004-2007, \$120,000.

"A Large-Scale Experimental Investigation of the Impact of Ethanol on Groundwater Contamination", Gulf Coast Hazardous Substances Research Center, 2004-2005, \$45,000.

"A Large-Scale Experimental Investigation of the Impact of Ethanol on Groundwater Contamination", Gulf Coast Hazardous Substances Research Center, 2003-2004, \$95,000.

"Chlorinated Solvent Impact and Remediation strategies in the Dry Cleaning Industry", Gulf Coast Hazardous Substances Research Center, 2000 – 2003, \$149,400.

"Design Manual for the Extraction of Contaminants from Subsurface Environments", Environmental Protection Agency, 1994-2002, \$4,500,000.

"Development of Data Evaluation/Decision Support System for Bioremediation of Subsurface Contamination", Environmental Protection Agency, 1993-1996, \$450,000.

Shell Distinguished Chair in Environmental Science, Shell Oil Company Foundation, 1988-1993, \$750,000.

"Evaluation of Nitrate-Based Bioremediation: Eglin Air Force Base", Environmental Protection Agency, 1992-1993, \$120,000.

"Decision Support System for Evaluating Remediation Performance with Interactive Pump-and-Treat Simulator", Environmental Protection Agency, 1992-1994, \$250,000.

"Characterization of Oil and Gas Waste Disposal Practices and Assessment of Treatment Costs", Department of Energy, 1992-94, \$200,000.

"Subsurface Monitoring Data for Assessing In-Situ Biodegradation of Aromatic Hydrocarbons (BTEX) in Groundwater", American Petroleum Institute, 1991-93, \$170,000.

"System 9 GIS System", Prime Computers, 1989-90, \$50,000.

"Effects of Various Pumping and Injection Schemes and Variable Source Loading on Bioremediation", American Petroleum Institute, 1988-90, \$186,000.

"Parameter Estimation System for Aquifer Restoration Model", U.S. Environmental Protection Agency, 1987-89, \$400,000.

"Distribution of BIOPLUME II", National Center for Ground Water Research (EPA), 1987-88, \$40,000.

"Development and Application of a Groundwater Modeling Data Base for Hazardous Waste Regulation", American Petroleum Institute, 1987-88, \$40,000.

"Practical Procedures for Evaluating Attenuation of Ground Water Contaminants Due to Biotransformation Process", National Center for Ground Water Research (EPA), 1986-87, \$150,000.

"Modeling and Field Testing of Contaminant Transport with Biodegradation and Enhanced In Situ Biochemical Reclamation", National Center for Ground Water Research (EPA), 1985-88, \$249,000.

"Ground Water Modeling for the Houston Water Plant", City of Houston, subcontracts from Law Engineering & Testing Co., 1985-86, \$127,000.

"Environmental Fate and Attenuation of Gasoline Components in the Subsurface", American Petroleum Institute, 1984-86, \$78,300.

"Simulation of Contaminant Transport Influenced by Oxygen Limited Biodegradation", National Center for Ground Water Research (EPA), 1984-85, \$25,500.

"Ground Water Pollutant Transport along Flow Lines for Hazardous Waste Sites", National Center for Ground Water Research (EPA), 1983-85, \$167,000.

"Math Models for Transport and Transformation of Chemical Substances in the Subsurface", National Center for Ground Water Research (EPA), Subcontract from Oklahoma State University, 1982-83, \$15,000.

"Characterization of Ground Water Contamination from Hazardous Waste Sites", National Center for Ground Water Research (EPA), 1982-83, \$113,000.

"Characterization of Ground Water Contamination from Hazardous Waste Sites". National Center for Ground Water Research (EPA), 1980-82, \$45,000.

PUBLICATIONS AND PRESENTATIONS

A. Books or Related Chapters

1. Fang, Z., Sebastian A., and Bedient, P.B. 2014. "*Modern Flood Prediction and Warning Systems.*" Handbook of Engineering Hydrology: Fundamentals and Applications (Chapter 21), Vol. 1, Taylor & Francis Inc. ISBN-10:1466552417.
2. Bedient, P. B. and W. C. Huber, 2012, "*Hydrology and Floodplain Analysis*", 5th Ed. Prentice-Hall Publishing Co., Upper Saddle River, NJ, February 2012, 800 page textbook.
3. Bedient, P. B., 2012 "*Lessons learned from Hurricane Ike*" Ed. Philip Bedient. College Station, TX: Texas A&M University Press, College Station, TX: 2012, 194 Pages

4. Rifai H.S., Borden R.C., Newell C.J. and Bedient P.B., “ *Modeling Remediation of Chlorinated solvent plumes*” In *Situ Remediation of Chlorinated solvent Plumes*, Chapter 6, H.F. Stroo, C.H. Ward Editors, Springer, N.Y. 2010, 145 pp.
5. Fang, Z., Safiolea, E., Bedient, P.B. (2006) “*Enhanced Flood Alert and Control Systems for Houston.*” In Chapter 16, *Coastal Hydrology and Processes*, Ed. By Vijay P. Singh and Y. Jun Xu, Water Resource Publications, LLC, pp. 199-210
6. Capiro, N.L. and Bedient P.B. "*Transport of Reactive Solute in Soil and Groundwater*" *The Water Encyclopedia* (2005): 524-531.
7. Horsak, R.D., Bedient, P.B., Thomas, F.B., and Hamilton, C. "*Pesticides*", *Environmental Forensics* (2005).
8. Thompson, J.F. and Bedient, P.B. "*Urban Storm Water Design and Management,*" *The Engineering Handbook*, Chapter 94, CRC Press, 2004, 21 pp.
9. Bedient, P. B., Rifai H. S., and Newell C. J., "*Ground Water Contamination: Transport and Remediation*", 2nd Ed. PTR Publ., Upper Saddle River, NJ, 1999, 605 pages.
10. Charbeneau, R. J., Bedient, P. B. and Loehr R. C., "*Groundwater Remediation*", Technomic Publishing Co., Inc., Lancaster, PA 1992, 188 pages.

B. Peer Reviewed Journal Publications

1. Bass, B., Juan, A., Gori, A., Fang, Z., and Bedient, P.B. (2015). 2015 “Memorial Day Storm Flood Impacts for Changing Watershed Conditions in Brays Bayou, Houston, TX.” *ASCE Journal of Hydrologic Engineering* (in-review).
2. Torres, Jacob M., Benjamin Bass, Nicholas Irza, Zheng Fang, Jennifer Proft, Clint Dawson, Morteza Kiani, and Philip Bedient. "Characterizing the hydraulic interactions of hurricane storm surge and rainfall–runoff for the Houston–Galveston region." *Coastal Engineering* 106 (2015): 7-19.
3. Juan, A, Fang, Z., and Bedient, P.B. "Developing a Radar-Based Flood Alert System for Sugar Land, Texas." *Journal of Hydrologic Engineering* (2015).
4. Brody, S.D., Sebastian, A., Blessing, R., & Bedient, P.B. (2015). Case-study results from southeast Houston, Texas: Identifying the impacts of residential location on flood risk and loss. *Journal of Flood Risk Management*, (accepted for publication). doi: 10.1111/jfr3.12184
5. Fang, N., Dolan G., Sebastian, A., & Bedient, P.B. (2014). Case Study of Flood Mitigation and Hazard Management at the Texas Medical Center in the Wake of Tropical Storm Allison in 2001. *ASCE Natural Hazards Review*, 15(3). doi: 10.1061/(ASCE)NH.1527-6996.0000139.
6. Christian, J, Fang, Z., Torres, J., Deitz, R. and Bedient, P.B. "Modeling the Hydraulic Effectiveness of a Proposed Storm Surge Barrier System for the Houston Ship Channel during Hurricane Events." *Natural Hazards Review* 16, no. 1 (2014): 04014015

7. Burleson, Daniel W., Hanadi S. Rifai, Jennifer K. Proft, Clint N. Dawson, and Philip B. Bedient. "Vulnerability of an industrial corridor in Texas to storm surge." *Natural Hazards* 77, no. 2 (2015): 1183-1203.
8. Sebastian, A., Proft, J., Dawson, C., & Bedient, P.B. (2014). Characterizing hurricane storm surge behavior in Galveston Bay using the SWAN+ADCIRC model. *Coastal Engineering*, 88, 171-181. doi: <http://dx.doi.org/10.1016/j.coastaleng.2014.03.002>.
9. Brody, S.D., Blessing, R., Sebastian, A., & Bedient, P.B. (2014). Examining the impact of land use/land cover characteristics on flood losses. *Journal of Environmental Planning and Management*, 57(8), 1252-1265. doi: 10.1080/09640568.2013.802228.
10. Brody, S.D., Blessing, R., Sebastian, A., and Bedient, P.B. (2013). "Delineating the Reality of Flood Risk and Loss in Southeast, TX." *ASCE Natural Hazards Review*, 14, 89-97. doi: 10.1061/(ASCE)NH.1527-6996.0000091.
11. Fang, Z., Sebastian A., and Bedient, P.B. 2014. "Modern Flood Prediction and Warning Systems." *Handbook of Engineering Hydrology: Fundamentals and Applications (Chapter 21)*, Vol. 1, Taylor & Francis Inc. ISBN-10:1466552417.
12. Teague, A., J. Christian, and P. Bedient. (2013) "Use of Radar Rainfall in an Application of Distributed Hydrologic Modeling for Cypress Creek Watershed, Texas". *Journal of Hydrologic Engineering*. DOI: 10.1061/(ASCE)HE.1943-5584.000056.
13. Doubleday, G., Sebastian, A., Luttenchlager, T., and Bedient, P.B. (2013). "Modeling Hydrologic Benefits of Low Impact Development: A Distributed Hydrologic Model of The Woodlands, TX." *Journal of American Water Resources*, 1-13. doi: 10.1111/jawr.12095.
14. Christian, J., A. Teague, L. Dueñas-Osario, Z. Fang, and P. Bedient, (2012). "Uncertainty in Floodplain Delineation: Expression of Flood Hazard and Risk in a Gulf Coastal Watershed." *Journal of Hydrological Processes*, doi: 10.1002/hyp.9360.
15. Ray, T., Stepinski, E., Sebastian, A., Bedient, P.B. (2011) "Dynamic Modeling of Storm Surge and Inland Flooding in Texas Coastal Floodplain" ", *Journal of Hydraulic Engineering*, ASCE, Vol. 137, No.10, October 2011, ISSN 0733-9429/2011/10-1103-1110
16. Fang, Z., Bedient, P. B., and Buzcu-Guven, B. (2011). "Long-Term Performance of a Flood Alert System and Upgrade to FAS3: A Houston Texas Case Study". *Journal of Hydrologic Engineering*, ASCE Vol. 16, No. 10, October 1, 2011, ISSN 1084-0699/2011/10-818-828.
17. Teague, A., Bedient, P. and Guven, B. (2010). "Targeted Application of Seasonal Load Duration Curves using Multivariate Analysis in Two Watersheds Flowing into Lake Houston" (JAWRA-10-0003-P.R1). *Journal of American Water Resources Association*. Accepted.
18. Fang, Z, Zimmer, A., Bedient, P. B, Robinson, H., Christian, J., and Vieux, B. E. (2010). "Using a Distributed Hydrologic Model to Evaluate the Location of Urban Development and Flood Control Storage". *Journal of Water Resources Planning and Management*, ASCE, Vol. 136, No. 5, September 2010, ISSN 0733-9496/2010/5-597-601.

19. Fang, Z., Bedient, P. B., Benavides J.A, and Zimmer A. L. (2008). "Enhanced Radar-based Flood Alert System and Floodplain Map Library". *Journal of Hydrologic Engineering*, ASCE, Vol. 13, No. 10, October 1, 2008, ISSN 1084-0699/2008/10-926-938.
20. Gomez, D. E., De Blanc, P. C., Rixey, W., Bedient, P.B., Alvarez, P. J.J. (2008), "Evaluation of Benzene Plume Elongation Mechanisms Exerted by Ethanol Using RT3D with a General Substrate Interaction Module" *Water Resource Research Journal*, Vol. 44, May.
21. Rifai, H.S., Borden, R. C., Newell, C. J., and Bedient, P.B. "Modeling Dissolved Chlorinated Solvents in Groundwater and Their Remediation," in SERDP monograph on Remediation of Dissolved Phase Chlorinated Solvents in Groundwater, (accepted) 2007.
22. Bedient, P. B., Holder, A., and Thompson, J. F., and Fang, Z. (2007). "Modeling of Storm water Response under Large Tailwater Conditions – Case Study for the Texas Medical Center". *Journal of Hydrologic Engineering*, Vol. 12, No. 3, May 1, 2007.
23. Capiro, N.L., Stafford, B.P., Rixey, W.G., Alvarez, P.J.J. and Bedient, P.B. "Fuel-Grade Ethanol Transport at the Water Table Interface in a Pilot-Scale Experimental Tank" *Water Research*, 41(3), pp. 656-654, 2007.
24. Bedient, P.B., Rifai, H.S., Suarez, M.P., and Hovinga, R.M. "Houston Water Issues" Chapter in *Water for Texas*. Jim Norwine and J.R. Giardino, Eds. pp. 107-121, 2005.
25. Characklis, G.W., Griffin, R.C., and Bedient, P.B. "Measuring Long-term Benefits of Salinity Reduction" *Journal of Agricultural and Resource Economics*, 30 (1) (2005): 69-93.
26. Bedient, P.B., Horsak, R.D., Schlenk, D., Hovinga, R.M., and Pierson, J.D. "Environmental Impact on Fipronil to Louisiana Crawfish Industry" *Environmental Forensics* (2005): 289-299.
27. Characklis, G. W., Griffin, R.C., and Bedient, P.B. "Measuring the Long-term Benefits of Salinity Reduction" *Journal of Agricultural and Resource Economics*, 30(1), pp.69-93, 2005.
28. Vieux, B.E. and Bedient, P.B. "Assessing urban hydrologic prediction accuracy through event reconstruction" *Journal of Hydrology*, 299(3-4), pp. 217-236. Special Issue on Urban Hydrology, 2004.
29. Thompson, J.F. and Bedient, P.B. "Urban Storm Water Design and Management" *The Engineering Handbook*, Chapter 94, CRC Press, 2004, 21 pp.
30. Capiro, N.L. and Bedient P.B. "Transport of Reactive Solute in Soil and Groundwater" *The Encyclopedia of Water*, John Wiley and Sons, Inc., New York, NY, USA pp. 524-531, 2005.
31. Bedient, P.B., Holder, A., and Benavides, J. "Advanced Analysis of T.S. Allison's Impacts" submitted to *Jn. of American Water Resources Assn.*, 2004.
32. Bedient, P. B., A. Holder, J. Benavides, and B. Vieux "Radar-Based Flood Warning System applied to TS Allison, *ASCE Journal of Hydrologic Engineering*, 8(6), pp 308-318, Nov, 2003.
33. Glenn, S., Bedient, P.B., and B. Vieux "Ground Water Recharge Analysis Using NEXRAD in a GIS Framework" submitted to *Ground Water*, October 2002.
34. Bedient, P.B., Vieux, B.E., Vieux, J.E., Koehler, E.R., and H.L. Rietz "Mitigating Flood Impacts of Tropical Storm Allison" accepted by *Bulletin of American Meteorological Society*, 2002.
35. El-Beshry, M., Gierke, J.S., and P.B. Bedient "Practical Modeling of SVE Performance at a Jet-Fuel Spill Site" *ASCE Journal of Environmental Engineering* pp. 630-638, (127) 7, July 2001.
36. El-Beshry, M.Z., Gierke, J.S., and P.B. Bedient "Modeling the Performance of an SVE Field Test" in Chapter 7, *Vadose Zone Science and Technology Solutions*, Brian B. Looney and Ronald W. Falta Editors, Vol. II, pp. 1157-1169, (2000).
37. Rifai, H.S., Brock, S.M. Ensor, K.B., and P.B. Bedient "Determination of Low-Flow

- Characteristics for Texas Streams" ASCE Journal of Water Resources Planning and Management, (126)5, pp.310-319, September-October 2000.
38. Bedient, P.B., Hoblit, B.C., Gladwell, D.C., and B.E. Vieux "NEXRAD Radar for Flood Prediction in Houston" ASCE Journal of Hydrologic Engineering, 5(3), pp. 269-277, July 2000.
 39. Hamed, M.M., Nelson, P.D., and P.B. Bedient "A Distributed Site Model for Non-equilibrium Dissolution of Multicomponent Residually Trapped NAPL" Environmental Modeling and Software, (15), pp. 443-450, September 2000.
 40. Holder, A.W., Bedient, P.B., and C.N. Dawson "FLOTRAN, a Three-dimensional Ground Water Model, with Comparisons to Analytical Solutions and Other Models" Advances in Water Resources, pp. 517-530. 2000.
 41. Rifai, H.S., Bedient, P.B., and G.L. Shorr "Monitoring Hazardous Waste Sites: Characterization and Remediation Considerations" Journal of Environmental Monitoring, 2(3), pp. 199-212, June 2000.
 42. Hoblit, B.C., Baxter, E.V., Holder, A.W., and P.B. Bedient "Predicting With Precision" ASCE Civil Engineering Magazine, 69(11), pp. 40-43, November 1999.
 43. Bedient, P.B., Holder, A.W., Enfield, C.G., and A.L. Wood "Enhanced Remediation Demonstrations at Hill Air Force Base: Introduction" Innovative Subsurface Remediation: Field Testing of Physical, Chemical, and Characterization Technologies, Mark L. Brusseau, et al., eds., pp. 36-48, American Chemical Society, Washington, DC, 1999.
 44. Holder, A.W., Bedient, P.B., and J.B. Hughes "Modeling the Impact of Oxygen Reaeration on Natural Attenuation" Bioremediation Journal, 3(2): 137-149, June 1999.
 45. Characklis, G.W., Griffin, R.C., and P.B. Bedient "Improving the Ability of a Water Market to Efficiently Manage Drought" Water Resources Research, (35) 3, 823-831, March 1999.
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Conference Proceedings and Other Technical Publications (since 1995)

1. Juan, A., Fang, Z., and Bedient, P. B. (2012). "Flood Warning Indicator: Establish a Reliable Radar-Based Flood Warning System for Sugar Land, Texas", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
2. Deitz, R., Christian, J. K., Wright, G., Fang, Z., and Bedient, P. B. (2012). "Linkage of Rainfall-Runoff and Hurricane Storm Surge in Galveston Bay", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
3. Bedient, P. B., Doubleday, G., Sebastian, A., and Fang, Z. (2012). "Distributed Hydrologic Modeling of LID in the Woodlands, Texas", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
4. Burcham, M., Bedient, P. B., McGuire, T., Adamson, D., New Ch., (2012) Occurrence of Sustained Treatment Following Enhanced Anaerobic Bioremediation at Chlorinated Solvent Sites, AGU Fall Meeting, San Francisco, California, December 3-7 2012
5. Fang, Z. and Bedient, P., Performance Evaluation of a NEXRAD-Based Flood Warning during Recent Events in 2012, AGU Fall Meeting, San Francisco, California, December 3-7 2012
6. Juan, A., Fang, Z. and Bedient, P., Radar-based Flood Warning Indicator for the Upper Oyster Creek Watershed in Sugar Land, Texas, AGU Fall Meeting, San Francisco, California, December 3-7 2012
7. Environmental and Water Res. Inst. (EWRI) 2012 Congress, Organized three sessions for SSPEED research results. Albuquerque, New Mexico, May 20-24 2012.
8. Fang, Z. and Bedient, P. B. (2012). "Creating Flood Alert Systems in Coastal Areas", SSPEED Conference – Gulf Coast Hurricanes: Mitigation and Response, Houston, Texas, April 10.
9. Fang, Z. and Bedient, P. B. (2012). "Advanced Radar-Based Flood Warning System for Urban

Areas and its Performance Evaluation”, SSPEED Conference – Gulf Coast Hurricanes: Mitigation and Response, Houston, Texas, April 11.

10. Teague, A, and Bedient, P. B. (2011). “Visualization of Hydrologic Simulations with Pollutant Load Estimation for Cypress Creek Watershed, Houston, Texas”. 2011 World Environmental and Water Resources Congress. Palm Springs California 22-26 May 2011.
11. Christian, J. K., Fang, Z., and Bedient, P. B. (2011). “Probabilistic Floodplain Delineation”, 2011 World Environmental and Water Resources Congress, Palm Springs, California. May 22-26
12. Fang, Z., Juan, A., Bedient, P. B., Kumar, S., and Steubing, C. (2011). “Flood Warning Indicator: Establishing a Reliable Radar-Based Flood Warning System for the Upper Oyster Creek Watershed”, ASCE/TFMA, TFMA 2011 Annual Conference, Sugar Land, Texas, April 11- 14.
13. Bedient, P. B. and Fang, Z. (2010). "Advanced Radar-based Flood Warning System for Hurricane-prone Urban Areas and Performance during Recent Events", 2nd International Conference on Flood Recovery, Innovation and Response (FRIAR), Milano, Italy, May 26-28.
14. Fang, Z., Juan, A., Bedient, P. B., Kumar, S., and Steubing, C. (2010). "Flood Alert System for Upper Oyster Creek Watershed in Sugar Land, Texas using NEXRAD, HEC-HMS, HEC-RAS, and GIS", ASCE/TFMA, TFMA 2010 Annual Conference, Fort Worth, Texas, June 7- 10.
15. Fang, Z. and Bedient, P. B. (2010). "Radar Applications in Flood Warning System for an Urban Watershed in Houston, Texas", Remote Sensing and Hydrology 2010 Symposium - Special Session on Flood Forecasting and Management with Remote Sensing and GIS, Jackson Hole, WO, September 27 -30.
16. Bedient, P. B., Fang, Z., and Vieux, B. E. (2010). "Radar-based Flood Warning System for the Texas Medical Center and Performance Evaluation", National Flood Workshop, Houston, Texas, October 24-26.
17. Teague, A. and Bedient, P. 2010. “Distributed Modeling of Water Quality in Cypress Creek Watershed, Houston, Texas”. 21st Century Watershed Technology: Improving Water Quality and the Environment, EARTH University, Costa Rica, February 21-24, 2010.
18. Teague, A. and Bedient, P. 2010. “Visualization of Hydrologic Simulations in Support of Water Quality Applications for Cypress Creek, Houston, Texas”. Conference Proceedings. Annual Water Resources Conference, American Water Resources Association. November 1-4, 2010, Philadelphia, PA.
19. Teague, A. and Bedient, P. 2010. “Distributed Water Quality Modeling for a Drinking Water Source Watershed for the City of Houston, Texas”. Conference Proceedings. World Environmental and Water Resources Congress. May 16-20, 2010, Providence, RI.
20. Fang, Z. and Bedient, P.B. (2009). “Radar-based Flood Warning System for Houston and Its Performance Evaluation”. American Geophysical Union (AGU) 2009 Fall Meeting, December 14-18, San Francisco, CA.
21. Fang, Z. and Bedient, P.B. (2009). “Radar-based Flood Alert System for Coastal Area and Collaborated Efforts for Disaster Prevention and Risk Management”. IRCD 34th Annual Natural Hazards Research and Applications Workshop – Hazards and the Economy: Challenges and Opportunity, July 15-18, Boulder, CO.

22. Fang, Z. and Bedient, P.B. (2009). "Flood Inundation Prediction and Performance during Hurricane Ike". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Kansas City, Missouri, May 17-21.
23. Robinson, H., Fang, Z. and Bedient, P.B. (2009). "Distributed Hydrologic Modeling of the Yuna River Watershed in the Dominican Republic". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Kansas City, Missouri, May 17-21.
24. Ray, T., Fang, Z., and Bedient, P.B. (2009). "Assessment of Flood Risk Due to Storm Surge in Coastal Bayous Using Dynamic Hydraulic Modeling". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Kansas City, Missouri, May 17-21.
25. Fang, Z. and Bedient, P.B. (2009). "Advanced Radar-based Flood Forecasting Systems for a Highly Urbanized Coastal Area and SSPEED Center", ASCE/TFMA Flood Awareness and Flood Response Workshop, April 29, San Marcos, TX.
26. Fang, Z. and Bedient, P.B. (2009). "Flood Warning Systems for Urban Flooding". Grand Challenges in Coastal Resiliency I: Transforming Coastal Inundation Modeling to Public Security, January 20-21, Baton Rouge, LA.
27. Fang, Z. and Bedient, P.B. (2008). "NEXRAD Radar-based Hydraulic Flood Prediction System for a Major Evacuation Routes in Houston". American Geophysical Union 2008 Fall Meeting, December 15-19, San Francisco, CA.
28. Fang, Z. and Bedient, P.B. (2008). "Advanced Flood Alert System with Hydraulic Prediction for a Major Evacuation Route in Houston". Proceedings of American Water Resources Association (AWRA) Annual Conference 2008, New Orleans, Louisiana, November 17-20.
29. Fang, Z. and Bedient, P.B. (2008). "Flood Inundation Prediction and Performance during Hurricane Ike". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
30. Bedient, P.B. and Fang, Z. (2008). "Predicting and Managing Severe Storms in the Gulf Coast through University Research". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
31. Robinson, H., Fang, Z. and Bedient, P.B. (2008). "Distributed Hydrologic Model Development in the Topographically Challenging Yuna River Watershed, Dominican Republic". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
32. Ray, T., Fang, Z. and Bedient, P.B. (2008). "Assessment of Flood Risk Due to Storm Surge in Coastal Bayous Using Dynamic Hydraulic Modeling". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
33. Fang, Z. and Bedient, P.B. (2008). "Floodplain Map Library (FPML): Innovative Method for Flood Warning System for Urban Watershed in Houston, TX". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Honolulu, Hawaii, May 13-16.
34. Bedient, P.B., "Foresight Panel on Environmental Effects" Houston-Galveston Area Council,

Houston, Texas, February 5, 2008

35. Bedient, P.B., Fang, Z., Hovinga, R, M., "Flood Warning System (FAS₂) Rice University Training, Houston, Texas, January 15, 2008
36. Bedient, P.B., Fang, Z., Hovinga, R, M., SSPEED Meeting, Houston, Texas, November 16, 2007
37. Fang, Z. and Bedient, P.B. "Real-time Hydraulic Prediction Tool – Floodplain Map Library (FPML)". American Water Resources Association 2007 Annual Conference, Albuquerque, New Mexico, November 12-15, 2007
38. Fang, Z. and Bedient, P.B. "Enhanced NEXRAD Radar-based Flood Warning System with Hydraulic Prediction Feature: Floodplain Map Library (FPML)". American Geophysical Union 2007 Fall Meeting, San Francisco, CA. December 10-14, 2007
39. Fang, Z. and Bedient, P.B. "The Future of Flood Prediction in Coastal Areas" Severe Storm Prediction, Evacuation, and Education from Disasters Conference, Rice University, Houston Texas, May 8-10, 2007
40. Bedient, P.B. and Fang, Z. "Radar-based Flood Warning System Using Dynamic Floodplain Map Library." Proceedings of World Environmental & Water Resources Congress 2007, Environmental and Water Resources Institute (EWRI), ASCE, Tampa, Florida, May 15-19, 2007
41. Bedient, P.B., and C. Penland "A Radar Based FAS for Houston's Texas Medical Center" IDRC Conference, Davos, Switzerland, Aug 2006.
42. Safiolea, E. and P.B. Bedient "Comparative Analysis of the Hydrologic Impact of Land Use Change and Subsidence in an Urban Environment" Proceedings of AWRA GIS Conference, Houston, TX, May 8-10, 2006.
43. Bedient, P.B., Fang, Z., and R. Hovinga "Prediction for Severe Storm Flood Levels for Houston Using Hurricane Induced Storm Surge Models in GIS Frame" Proceedings of AWRA GIS Conference, Houston, TX, May 8-10, 2006.
44. Fang, Z., Safiolea, E., and P.B. Bedient "Enhanced Flood Alert and Control Systems for Houston" Proceedings of 25th American Institute of Hydrology Conference, Baton Rouge, LA, May 21-24, 2006.
45. Gordon, R. and P.B. Bedient "Rice University Engineers Without Borders: An Exercise in International Service Learning" Proceedings of the ASE Education Conference, Chicago, June 18-21, 2006.
46. Gordon, R., Benavides, J.A., Hovinga, R., Whitko, A.N., and P.B. Bedient "Urban Floodplain Mapping and Flood Damage Reduction Using LIDAR, NEXRAD, and GIS" Proceedings of the 2006 AWRA Spring Specialty Conference: GIS and Water Resources IV, Houston, TX, May 8-10, 2006.
47. Fang, Z. and P.B. Bedient "IP2 Houston Flood Alert and Response-2006" CASA Meeting, Estes Park, Co, October 16-17, 2006.
48. Safiolea, E., Bedient, P.B., and B.E. Vieux "Assessment of the Relative Hydrologic Effects of Land Use Change and Subsidence Using Distributed Modeling" (July 2005).

49. Holder, A.W., Hoblit, B., Bedient, P.B., and B.E. Vieux "Urban Hydrologic Forecasting Application Using the NEXRAD Radar in Houston" Proceedings of the Texas Section American Society of Civil Engineers, Austin, TX, pp. 279-288, April 5-8, 2000.
50. Benavides, J.A., Pietruszewski, B., Stewart, E., and P.B. Bedient "A Sustainable Development Approach for the Clear Creek Watershed" Proceedings of the Texas Section American Society of Civil Engineers, Austin, TX, pp. 269-278, April 5-8, 2000.
51. Bedient, P.B., Rifai, H.S., and C.W. Newell "Decision Support System for Evaluating Pump-and-Treat Remediation Alternatives" Pollution Modeling: Vol. 1, Proceedings for Envirosoft 94, November 16-18, 1994, San Francisco, CA, Edited by P. Zannetti, Computational Mechanics Publications, Wessex Inst of Technology, Southampton, UK.
52. Hamed M.M. and P.B. Bedient "Uncertainty Analysis of Natural Attenuation in Groundwater Systems," Proceedings of the In Situ and On-Site Bioremediation Symposium, New Orleans, LA, 1997, 1:43-48.
53. Hamed, M.M., Holder, A.W., and P.B. Bedient "Evaluation of Reaeration Using a 3-D Groundwater Transport Model" Proceedings of the In Situ and On-Site Bioremediation Symposium, New Orleans, LA, 1997, 1:75-80.
54. Holder, A.W., Bedient, P.B., and J.B. Hughes "TCE and 1,2-DCE Biotransformation Inside a Biologically Active Zone" Proceedings of the First International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 18-21, 1:219-224, 1998.
55. Hamed M.M. and P.B. Bedient "Uncertainty Analysis of Natural Attenuation in Groundwater Systems" Proceedings of the In Situ and On-Site Bioremediation Symposium, New Orleans, LA, 1997, 1:43-48.
56. Hamed, M.M., Holder, A.W., and P.B. Bedient "Evaluation of Reaeration Using a 3-D Groundwater Transport Model" Proceedings of the In Situ and On-Site Bioremediation Symposium, New Orleans, LA, 1997, 1:75-80.
57. Hamed, M.M., Bedient, P.B., and J.P. Conte "Probabilistic Modeling of Contaminant Transport in the Subsurface" Proceedings of the International Association of Hydro geologists Conference Solutions '95", Edmonton, Canada, June 4-10, 1995.

Invited Lectures (Recent)

1. The Resilience and Adaptation to Climate Risks Workshop: NASA Johnson Space Center and the Houston/Galveston Area, March 8, 2012, Houston, Texas
2. Bedient, P.B., SSPEED Conference. Chair and Organizer, "*Hurricane Ike, Revisited*," September 14, 2009, Houston, Texas.
3. Bedient, P.B., SSPEED Conference. Chair and Organizer, "*Severe Storm Prediction and Global Climate Impact in the Gulf Coast*," Sponsored by American Institute of Hydrology. October 29-31, 2008, Houston, Texas. (Attended by over 150 guests and speakers).
4. Bedient, P.B., SSPEED Conference. Chair and Organizer, "*Severe Storm Prediction and Global Climate Impact in the Gulf Coast*," Sponsored by American Institute of Hydrology. October 29-31, 2008, Houston, Texas. (Attended by over 150 guests and speakers).

5. Bedient, P.B., Robinson, and H., Fang, Z. (2008). "Distributed Hydrologic Model Development in the Topographically Challenging Yuna River Watershed, Dominican Republic". Meeting in Dominican Republic before the President October 20, 2008.
6. Bedient, P.B. (June, 2008) Plan for the Dominican Republic Flood Study, before the Ministers of Education, Environment, and Economic Development.
7. Bedient, P.B. "Advanced Flood Alert Systems in Texas" International Disaster Response Conference, Daves, Switzerland, August 28, 2006.
8. Bedient, P.B. "IP2 Flood Alert System for Houston" CASA Meeting NSF Review, UMASS. April, 2006.
9. Bedient, P.B. "Severe Storm Impacts in the Gulf Coast" Severe Storm Impacts and Disaster Response in Gulf Coast, Houston, Rice University, March 15-16, 2006.
10. Bedient, P.B. "Living with Severe Storms in the Gulf Coast- Scientia Lecture" Rice University, Houston, TX. (September 2005).
11. Bedient, P.B., Fang, Z., Safiolea, E., and B.E. Vieux "Enhanced Flood Alert System for Houston" 2005 National Hydrologic Council Conference: Flood Warning Systems, Technologies and Preparedness, Sacramento, California. (May 16-20)
12. Fang, Z. and Bedient, P.B. "Enhanced Flood Alert and Control Systems for Houston" Proceedings of the 25th American Institute of Hydrology Conference: Challenges of Coastal Hydrology and Water Quality. Baton Rouge, Louisiana, May 21-24, 2006.
13. Fang, Z., Bedient, P.B., and R. Hovinga "Prediction of Severe Storm Flood Levels for Houston Using Hurricane Induced Storm Surge Models in a GIS Frame" Proceedings of AWRA 2006 Spring Specialty Conference: GIS and Water Resources IV. Houston, Texas, May 8-10, 2006.
14. Bedient, P.B. "Impacts of Climate Change on Transportation Systems and Infrastructure" Gulf Coast Study, Lafayette, LA. (May 2005)
15. Capiro, N.L., Da Silva, M.L.B., Stafford, B.P., Alvarez, P.J.J., and P.B. Bedient "Changes in Microbial Diversity Resulting from a Fuel-Grade Ethanol Spill" Eighth International Symposium on In Situ and On-Site Bioremediation, Baltimore, MD. (June 2005).
16. Safiolea, E. and P. B. Bedient "Assessment of the Relative Hydrologic Effect of Land Use Change and Subsidence Using Distributed Modeling" EWRI Watershed Management Conference, Williamsburg, VA. (July 9-22, 2005)
17. Capiro, N.L., Stafford, B., He, X., Rixey, W.G., and P.B. Bedient "A Large-Scale Experimental Investigation of Ethanol Impacts on Groundwater Contamination" Presentation at the Fourth International Conference on Remediation of Chlorinated and Recalcitrant Compounds; Monterey, CA; May 2004.
18. Capiro, N.L., Da Silva, M.L.B., Stafford, B.P., Alvarez, P.J.J., and P.B. Bedient "Changes in Microbial Diversity Resulting from a Fuel-Grade Ethanol Spill" Accepted for Presentation at The Eighth International Symposium on In Situ and On-Site Bioremediation; Baltimore, MD. June 2005.
19. Safiolea, E. and P.B. Bedient "Analysis of Altered Drainage Patterns and Subsidence Impact Using a Distributed Hydrologic Model" AWRA Annual Water Resources Conference in Orlando

FL, November 2004.

20. Safiolea, E. and Philip B. Bedient "Assessment of the Relative Hydrologic Effect of Land Use Change and Subsidence using Distributed Modeling" EWRI Watershed Management Conference in Williamsburg VA, Jul19-22, 2005.
21. Bedient, P.B. and J.A. Benavides "Use of QPE and QPF for Flood Alert (FAS2) in the Houston, TX Test Bed" CASA NSF ERC Conference, "Estes Park, CO, October, 2004.
22. Capiro, N.L., Adamson, D.T., McDade, J.M., Hughes, J.B., and P.B. Bedient "Spatial Variability of Dechlorination Activity Within a PCE DNAPL Source Zone" Presentation The 7th International Symposium In Situ and On-Site Bioremediation; Orlando, FL; June 2003
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