

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

ADDRESS:

Herman Brown Professor of Engineering
Department of Civil and Environmental Engineering
Rice University
6100 Main St. /MS - 317
Houston, Texas 77005
(713) 348-4953 or fax (713) 348-5239

P.B. Bedient and Assoc., Inc.
13910 Wilde Forest Court
Sugar Land, TX 77498
(281) 491-3911

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
International Water Resources Association
Association of Environmental Engineering Professors
National Ground Water Association

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 2007-2009
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:

ABET Committee, Undergraduate Curriculum Committee, Space Committee, 2005-2009
 Center for Civic Engagement Committee, 2007-2009
 Parking Committee, 2007-2009
 Search Committee, Civil and Environmental Engineering, (2001-2002)
 Chair, Dean of Engineering Search Committee, (1988)
 Computer Committee, Parking Committee, Athletics Committee, 1998-2000
 School of Engineering Advisory Council.

LICENSES:

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

RESEARCH INTERESTS:

Floodplain Management - Analysis of effects of land use changes and development patterns on flood hydrographs and floodplain boundaries; use of lumped and distributed hydrologic models; detailed modeling of alternative flood control strategies and dynamic floodplain models. Analysis of the severe storm impacts in urban watershed areas using radar rainfall data, combined with GIS techniques for digital terrain and hydraulic modeling in Houston and other coastal areas in Texas.

Flood Alert Systems with Radar - The development of a real-time flood ALERT system (FAS) for Brays Bayou and the Texas Medical Center in Houston, TX has been completed. The FAS currently uses NEXRAD radar for application to flood prediction and real-time flood alert systems. FAS2 is a second-generation system being implemented with funding from FEMA after TS Allison. TXDOT funded a new FAS for inundated bridge crossings (2008).

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%)
- 11 Ph.D. and 53 M.S. degrees since 1975

RESEARCH STATEMENT:

Dr. Philip B. Bedient is the 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 55 research projects over the past 33 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, 4th ed., 2008) used in over 75 universities across the U.S. He also has a second text on "Groundwater Contamination" (Prentice Hall, 2nd ed., 1999). 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 has worked on surface water problems for over 33 years including major floodplain studies, water quality assessments, and hydrologic modeling for a number of watersheds in Texas, Florida, and Louisiana. He has been actively involved in the area of hydrologic analysis for flood prediction and warning, and recently teamed with others to develop a real-time flood alert system for the Texas Medical Center. It is based on converting NEXRAD radar directly to rainfall via a GIS system, which is then used in hydrologic models for predicting peak floods. The system is currently delivered real-time on a web site that has been tested on major flood events in Houston, including T.S. Allison.

Dr. Bedient has been continuously supported by federal, state, and local research grants for the past 33 years at Rice University. Rice University and University of Houston were recently funded by the Houston Endowment to develop a prototype system, Watershed Information Sensing and Evaluation **WISE**, which encompass use of existing and expanding radar technology; automated real-time flow and water quality sensors and forecasting models in local Bayous in Houston. It is envisioned that **WISE** will be delivered via Internet to the broader Houston Community, and that significant training and educational programs related to the mission of watersheds for the future will be an integral component of the proposed effort. He is also funded by HGAC (TxDOT) to develop a real time flood alert system for bridge inundation within the Houston area.

Dr. Bedient organized the Houston flood testbed for the Center for Collaborative Adaptive Sensing of the Atmosphere (CASA), an NSF Engineering Research Center led by UMass Amherst, and the Univ. of Oklahoma, Colorado State Univ. as core academic partners, and Rice Univ. as a strategic outreach partners. The new technology is expected to increase the warning time for tornadoes, flash floods, and other severe weather events with greater accuracy than existing systems.

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.

Dr. Bedient has lead "The AECOM Knowledge Transfer program" which supports the education of Libyan engineers in the areas of civil and environmental engineering. These engineers will work with AECOM, a large American engineering company, to rebuild the country of Libya in terms of civil infrastructure (i.e., roads, water systems, and housing). Over 20 instructors from major Texas universities provide the teaching faculty for this important training program.

SURFACE WATER PROJECT

“SSPEED Center Proposal to the Houston Endowment”, Houston Endowment, 2011-2014, \$3.2 million

“White Oak Bayou BMP Demonstration Project – Cottage Grove Subdivision”, City of Houston, 2009-2012, \$240,000.

“Hurricane Ike: Lessons learned and steps to the future”, Houston Endowment, 2009-2011, \$1.25 million

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

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

“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, 2007-09, \$100,000.

“Civil and Environmental Engineering for the 21st Century”, NSF Dept Reform Grant, 2005-07, \$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, 2003-2009, \$280,000.

“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, 1991-92, \$35,000.

"Characterization of Non-Point Sources and Loadings to Galveston Bay", Galveston Bay National Estuary Program, 1990-91, \$125,000.

"Linkages between Sewage Treatment Plant Discharges, Lake Houston Water Quality, and Potable Water Supply during Storm Events", City of Houston, 1984-85, \$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, 1983-84. \$15,000.

"Sedimentation and Nonpoint Source Study of Lake Houston", Houston-Galveston Area Council, 1981-82, \$55,000.

"Environmental Study of the Lake Houston Watershed - Phase II", Houston-Galveston Area Council, 1980-81, \$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, 1977-78, \$62,414.

"Maximum Utilization of Water Resources in a Planned Community", The Woodlands Project, 1975-76.

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, subcontract 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. Lindner, J., Schwertz, D., Bedient, P. B., and Fang, Z., "Flood Prediction and Flood Warning Systems". In Chapter 4, *Severe Storm and Hurricane Prediction and the Impacts in the Gulf Coast*, Ed. by Philip B. Bedient and Jim Blackburn (2010 in Review).
2. 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.
3. Bedient, P. B. and Huber W. C., "*Hydrology and Floodplain Analysis*", 4th Ed. Prentice-Hall Publishing Co., Upper Saddle River, NJ, 2008, 795 pp.
4. Fang, Z., Safiolea, E., Bedient, P.B. "*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, 2006, pp. 199-210
5. Capiro, N.L. and Bedient P.B. "*Transport of Reactive Solute in Soil and Groundwater*" The Water Encyclopedia 2005, 524-531 pp.
6. Horsak, R.D., Bedient, P.B., Thomas, F.B., and Hamilton, C. "*Pesticides*", Environmental Forensics, 2005
7. Thompson, J.F. and Bedient, P.B. "*Urban Storm Water Design and Management,*" The Engineering Handbook, Chapter 94, CRC Press, 2004, 21 pp.
8. 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 pp.
9. Charbeneau, R. J., Bedient, P. B. and Loehr R. C., "*Groundwater Remediation*", Technomic Publishing Co., Inc., Lancaster, PA 1992, 188 pp.

B. Peer Reviewed Journal Publications

1. Ray, T., Stepinski, E., Sebastian, A., Bedient, P.B. "*Dynamic Modeling of Storm Surge and Inland Flooding in Texas Coastal Floodplain*" ", Journal of Hydrologic Engineering, ASCE, Vol. 137, No.10, October 2011, ISSN 0733-9429/2011/10-1103-1110
2. Fang, Z. Bedient, P. B., Guven, B. "*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.

3. Fang, Z., Bedient, P. B., Guven, B. “*Performance of an Operational Flood Alert System with Floodplain Map Library for Houston, Texas*”. Journal of Hydrologic Engineering, ASCE. (2011 in Press).
4. Teague, A., Bedient, P. and Guven, B. “*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. (2010 accepted.)
5. Fang, Z., Zimmer, A., Bedient, P. B., Robinson, H., Christian, J., and Vieux, B. E., “*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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. Thompson, J.F. and Bedient, P.B. “*Urban Storm Water Design and Management*” The Engineering Handbook, Chapter 94, CRC Press, 2004, 21 pp.
17. 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.
18. 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.
19. 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.
20. Glenn, S., Bedient, P.B., and B. Vieux “*Ground Water Recharge Analysis Using NEXRAD in a GIS Framework*” submitted to *Ground Water*, October 2002.

21. 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.
22. 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.
23. 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).
24. 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.
25. 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.
26. 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.
27. Holder, A.W., Bedient, P.B., and C.N. Dawson "FLOTTRAN, a Three-dimensional Ground Water Model, with Comparisons to Analytical Solutions and Other Models" *Advances in Water Resources*, pp. 517-530, 2000.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. Vieux, B.E. and P.B. Bedient "Estimation of Rainfall for Flood Prediction from WSR-88D Reflectivity: A Case Study, 17-18 October 1994" *Weather and Forecasting*, 1998 American Meteorological Society, 13:2, 407-415, June 1998.
34. Bedient, P.B. "Hydrology and Transport Processes" *Subsurface Restoration*, C.H. Ward, J.A. Cherry and M.R. Scalf, editors, Ann Arbor Press, Chelsea, MI, 59-73, 1997.
35. Hamed, M.M. and P.B. Bedient "On the Performance of Computational Methods for the Assessment of Risk from Ground-Water Contamination" *Ground Water*, 35(4), 638-646, July-August 1997.
36. Hamed, M.M. and P.B. Bedient "On the Effect of Probability Distributions of Input Variables in Public Health Risk Assessment" *Risk Analysis*, 17(1), 97-105, 1997.
37. Hamed, M.M., Bedient, P.B., and J.P. Conte "Numerical Stochastic Analysis of Groundwater Contaminant Transport and Plume Containment" *Journal of Contaminant Hydrology*, 1996, 24 pp.
38. Hamed, M.M., Bedient, P.B., and C.N. Dawson "Probabilistic Modeling of Aquifer Heterogeneity Using Reliability Methods" *Advances in Water Resources*, 19(5), 277-295, 1996.

39. Sweed, H., Bedient, P.B., and S.R. Hutchins "Surface Application System for In-Situ Bioremediation: Site Characterization and Modeling" *Groundwater Journal*, 34(2), 211-222, 1996.
40. Hamed, M.M., Conte, J.P., and P.B. Bedient "Uncertainty Analysis of Subsurface Transport of Reactive Solute Using Reliability Methods" *Groundwater Models for Resources Analysis and Management*, CRC Press, Inc., Chapter 8:123-135 1995.
41. Hamed, M.M., Conte, J.P., and P.B. Bedient "Probabilistic Screening Tool for Groundwater Contamination Assessment" *ASCE Journal of Environmental Engineering*, 121(11): 767-775, (1995).
42. Rifai, H.S. and P.B. Bedient "A Review of Biodegradation Models: Theory and Applications" *Groundwater Models for Resources Analysis and Management*, CRC Press, Inc., Chapter 16:295-312 (1995).
43. Rifai, H. S., Newell, C. J., Bedient, P.B., Shipley, F.S., and R.W. McFarlane, *The State of the Bay*, The Galveston Bay National Estuary Program, Webster, TX, 232 pp. (1994).
44. Rifai, H.S. and P.B. Bedient "Modeling Contaminant Transport and Biodegradation in Ground Water" *Advances in Environmental Science Groundwater Contamination, Volume I: Methodology and Modeling*, Springer-Verlag, New York, NY (1994).
45. Bedient, P.B. and H.S. Rifai "Modeling in Situ Bioremediation" *In Situ Bioremediation, When Does It Work?* National Academy Press, pp. 153-159 (1993).
46. Rifai, H. S., Bedient, P.B., Hendricks, L.A., and K. Kilborn "A Geographical Information System (GIS) User Interface for Delineating Wellhead Protection" *Ground Water*, 31:3, pp. 480-488 (1993).
47. H. S. Rifai, Newell, C. J., and P.B. Bedient "Getting to the Nonpoint Source with GIS" *Civil Engineering*, June, pp. 44-46 (1993).
48. H. S. Rifai, Newell, C. J., and P.B. Bedient "GIS Enhances Water Quality Modeling" *GIS World*, August, pp. 52-55 (1993).
49. Bedient, P.B., Schwartz, F.W., and H.S. Rifai "Hydrologic Design for Groundwater Pollution Control" *Handbook of Hydrology*, McGraw Hill, pp. 29.1-29.47 (1993).
50. Wise, W.R., Robinson, G.C., and P.B. Bedient "Chromatographic Evidence for Nonlinear Partitioning of Aromatic Compounds Between Petroleum and Water" *Ground Water*, 30(6): 936-944. (Nov. - Dec. 1992).
51. Charbeneau, R.J., Bedient, P.B., and R.C. Loehr, *Groundwater Remediation*, Technomic Publishing Co., Inc., Lancaster, PA, 188 pages (1992).
52. Bedient, P.B. and H.S. Rifai "Ground Water Contaminant Modeling for Bioremediation: A Review" *Journal of Hazardous Materials*, 32:225-243 (1992).
53. Kilborn, K., Rifai, H.S., and P. B. Bedient "Connecting Groundwater Models and GIS" *Geo Info Systems*, pp. 26-31, (February 1992).
54. Rifai, H. S. and P. B. Bedient "Modeling Contaminant Transport and Biodegradation in Ground Water" To be published in Textbook: *Advances in Environmental Science Groundwater Contamination, Volume I: Methodology and Modeling*, Springer Verlag, (In Press) (September 1991).
55. Newell, C.J., Rifai, H.S., and P.B. Bedient "Characterization of Non-Point Sources and Loadings to Galveston Bay" Galveston Bay National Estuary Program, Houston, Texas, 150 pp (October 1991).
56. Rifai, H.S., Long, G.P., and P.B. Bedient "Modeling Bioremediation: Theory and Field Application" *In Situ Bioreclamation Applications and Investigations for Hydrocarbon and*

Contaminated Site Remediation, Ed. by R. E. Hinchee and R. F. Olfenbittel, Battelle Memorial Institute, Butterworth-Heinemann, Boston, (1991).

57. Kilborn, K., Rifai, H.S., and P.B. Bedient "The Integration of Ground Water Models with Geographic Information Systems (GIS)" 1991 ACSM/ASPRS 10 Annual Convention, Baltimore, Maryland, In *Technical Papers*, vol. 2, pp. 150-159, (March 1991).
58. Wise, W.R., Chang, C.C., Klopp, R.A., and P. B. Bedient "Impact of Recharge Through Residual Oil Upon Sampling of Underlying Ground Water" *Ground Water Monitoring Review*, pp. 93-100 (Spring 1991).
59. Rifai, H.S. and P.B. Bedient "Comparison of Biodegradation Kinetics with an Instantaneous Reaction Model for Ground Water" *Water Resource. Res.* 26:637-645 (1990).
60. Newell, C.J., Hopkins, L.P., and P.B. Bedient "A Hydrogeologic Database for Ground Water Modeling" *Ground Water* 28:703-714 (1990).
61. Newell, C.J., Haasbeek, J.F., and P.B. Bedient "OASIS: A Graphical Decision Support System for Ground Water Contaminant Modeling" *Ground Water* 28:224-234 (1990).
62. Chiang, C.Y., Wheeler, M.F., and P.B. Bedient "A Modified Method of Characteristics Technique and Mixed Finite Elements Method for Simulation of Ground Water Contaminant Transport" *Water Resource. Res.* 25:1541-1549 (1989).
63. Todd, D.A., Bedient, P.B., Haasbeek, J.F., and J. Noell "Impact of Land Use and NPS Loads on Lake Water Quality" *ASCE J. Environmental Engr. Div.* 115:633-649 (1989).
64. Borden, R.C., Lee, M.D., Thomas, J.M., Bedient, P.B., and C.H. Ward "In Situ Measurement and Numerical Simulation of Oxygen Limited Biotransformation" *Ground Water Monit. Rev.* 9:83-91 (1989).
65. Rifai, H.S., Bedient, P.B., Wilson, J.T., Miller, K.M., and J.M. Armstrong "Biodegradation Modeling at an Aviation Spill Site" *ASCE J. Environmental Engr. Div.* 114:1007-1019 (1988).
66. Satkin, R.L. and P.B. Bedient "Effectiveness of Various Aquifer Restoration Schemes under Variable Hydrogeologic Conditions" *Ground Water*, 26:488-498 (1988).
67. Todd, D.A. and P B. Bedient "Stream Dissolved Oxygen Analysis and Control" (Closure), *ASCE J. Environmental Engr. Div.* 113:927-928 (1987).
68. Freeberg, K.M., Bedient, P.B., and J.A. Connor "Modeling of TCE Contamination and Recovery in a Shallow Sand Aquifer" *Ground Water* 25:70-80 (1987).
69. Borden, R.C. and P.B. Bedient "In Situ Measurement of Adsorption and Biotransformation at a Hazardous Waste Site" *Water Resour. Bull.* 23(4): 629-636 (1987).
70. Borden, R.C., Bedient, P.B., Lee, M.D., Ward, C.H., and J.T. Wilson " Transport of Dissolved Hydrocarbons Influenced by Oxygen Limited Biodegradation: 2. Field Application" *Water Resour. Res.* 22:1983-1990 (1986).
71. Borden, R.C. and P.B. Bedient "Transport of Dissolved Hydrocarbons Influenced by Reaeration and Oxygen Limited Biodegradation: 1. Theoretical Development" *Water Resour. Res.* 22:1973-1982 (1986).
72. C.H. Ward, Tomson, M.B., Bedient, P.B., and M.D. Lee "Transport and Fate Processes in the Subsurface" In R. C. Loehr, and J.F. Malina, Jr., eds., *Land Treatment, A Hazardous Waste Management Alternative*, Center for Research in Water Resources, University of Texas, Austin, TX, pp. 19-39. (1986).
73. Wilson, J.T., McNabb, J.F., Cochran, J.W., Wang, T.H., Tomson, M.B., and P.B. Bedient "Influence of Microbial Adaptation on the Fate of Organic Pollutants in Ground Water" *Environ. Toxicol. Chem.* 4:721-726 (1985).
74. Bedient, P.B. "Overview of Subsurface Characterization Research" In Ward, C.H., Giger, W., and

- P. L. McCarty, eds., *Ground Water Quality*, John Wiley & Sons, Inc., New York, NY, pp. 345-347 (1985).
75. Bedient, P.B., Flores, A., Johnson, S., and P. Pappas "Floodplain Storage and Land Use Analyses at the Woodlands, Texas" *Water Resour. Bull.* 21:543-551 (1985).
 76. Hutchins, S.R., Tomson, M.B., Bedient, P.B., and C.H. Ward "Fate of Trace Organics During Land Application of Municipal Wastewater" *CRC Crit. Rev. Environ. Control* 15:355-416 (1985).
 77. Todd, D.A. and P.B. Bedient "Stream Dissolved Oxygen Analysis and Control" *ASCE J. Environmental Engr. Div.* 111:336-352 (June 1985).
 78. Chiang, C.Y. and P.B. Bedient "PIBS Model for Surcharged Pipe Flow" *ASCE J. Hydraulics Div.* 112:181-192 (1985).
 79. Bedient, P.B., Borden, R.C., and D.I. Leib "Basic Concepts for Ground Water Transport Modeling" In Ward, C.H., Giger, W., and P.L. McCarty, eds., *Ground Water Quality*, John Wiley & Sons, Inc., New York, NY, pp. 512-531, (1985).
 80. Bedient, P.B., Rodgers, A.C., Bouvette, T.C., and M.B. Tomson "Ground Water Quality at a Creosote Waste Site" *Ground Water* 22:318-319 (1984).
 81. Bedient, P.B. and P.G. Rowe, eds., *Urban Watershed Management: Flooding and Water Quality*, Rice University Studies, 205 pp. (March 1979).
 82. Bedient, P.B., Huber, W.C., and J. Heaney "Environmental Model of the Kissimmee River Basin" *ASCE Water Resources Planning and Management*, Vol. 103, No. WR2, (1977).

Conference Proceedings and Other Technical Publications

1. Christian, J. K., Fang, Z., and Bedient, P. B. (2011). "Probabilistic Floodplain Delineation", 2011 World Environmental and Water Resources Congress, Palm Springs, CA. May 23-25
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.

20. Fang, Z. and Bedient, P.B. (2008). "Flood Inundation Prediction and Performance during Hurricane Ile". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
21. 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.
22. 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.
23. 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.
24. 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.
25. Bedient, P.B., "Foresight Panel on Environmental Effects" Houston-Galveston Area Council, Houston, Texas, February 5, 2008
26. Bedient, P.B., Fang, Z., Hovinga, R.M., "Flood Warning System (FAS₂) Rice University Training, Houston, Texas, January 15, 2008
27. Bedient, P.B., Fang, Z., Hovinga, R.M., SSPEED Meeting, Houston, Texas, November 16, 2007
28. 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
29. 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
30. 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
31. 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
32. Bedient, P.B., and C. Penland "A Radar Based FAS for Houston's Texas Medical Center" IDRC Conference, Davos, Switzerland, Aug, 2006.
33. 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.

34. 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.
35. 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.
36. Gordon, R. and P.B. Bedient "Rice University Engineers Without Borders: An Exercise in International Service Learning" *Proceedings of the ASEducation Conference*, Chicago, June 18-21, 2006.
37. 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.
38. Fang, Z. and P.B. Bedient "IP2 Houston Flood Alert and Response-2006" CASA Meeting, Estes Park, Co, October 16-17, 2006.
39. 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).
40. 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.
41. 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.
42. 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.
43. 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.
44. 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.
45. 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.
46. 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.
47. 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.

48. Hamed, M.M., Bedient, P.B., and J.P. Conte "Probabilistic Modeling of Contaminant Transport in the Subsurface" *Proceedings of the International Association of Hydrogeologists Conference Solutions '95*, Edmonton, Canada, June 4-10, 1995.
49. 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 Institute of Technology, Southampton, UK.
50. Burgess, K. S., Rifai, H. S., and P. B. Bedient "Flow and Transport Modeling of a Heterogeneous Field Site Contaminated with Dense Chlorinated Solvent Waste" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Restoration*, Houston, TX (Nov. 10-12, 1993).
51. Hamed, M., Conte, J., and P. B. Bedient "Reliability Approach to the Probabilistic Modeling of Ground Water Flow and Transport" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Restoration*, Houston, TX (Nov. 10-12, 1993).
52. Rifai, H.S. and P.B. Bedient "Ground Water Contaminant Modeling for Bioremediation: A Review" *Proceedings of the 4th Annual Symposium on Ground Water: The Problem and Some Solutions*, The Gulf Coast Hazardous Substance Research Center, Lamar University, Beaumont, Texas, 101-121 (April 2-3, 1992).
53. Thomas, J.M., Duston, K.L., Bedient, P.B., and C.H. Ward "In Situ Bioremediation of Contaminated Aquifers and Hazardous Waste Sites in Texas" *Proceedings for the Petro-Safe 92*, 3rd Annual Environmental and Safety Conference for the Oil, Gas & Petrochemical Industries, Houston, TX, Vol. 3, pp. 889-898 (1992).
54. Bedient, P.B., Long, G.P., and H.S. Rifai "Modeling Natural Biodegradation with BIOPLUME II" *Proceedings of the 5th International Conference, Solving Ground Water Problems with Models*, Dallas, Texas, pp 699-714. (February 11-13, 1992).
55. Robinson, G.C. and P.B. Bedient "Modeling a Time-Variant Source of Contamination" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Restoration*, Houston, Texas, pp. 531-540. (November 20-22, 1991).
56. Chang, C. and P. B. Bedient "Multiphase Unsaturated Zone Flow and Transport Model for Ground Water Contamination by Hydrocarbon" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Restoration*, Houston, Texas, pp. 515-529 (November 20-22, 1991).
57. Bedient, P.B., Vance, L.A., and H.S. Rifai "Implementation of Wellhead Protection Programs Utilizing Geographical Information Systems" *Proceedings of the Eighth National Conference on Microcomputers in Civil Engineering*, University of Central Florida and The American Society of Civil Engineers, Orlando, Florida, pp. 87-90 (October 1990).
58. Rifai, H.S., Bedient, P.B., and C.J. Newell "Review and Analysis of the Toxicity Characteristics Composite Landfill Model" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration*, The Association of Ground Water Scientists and Engineers (NWWA), Houston, Texas, pp.143-157 (October 1990).
59. Rifai, H.S. and P.B. Bedient "A TC Model Alternative for Production Waste Scenarios" *Proceedings of the First International Symposium on Oil and Gas Exploration and Production Waste Management Practices*, U.S. Environmental Protection Agency, New Orleans, LA, pp.

955-965 (September 1990).

60. Chang, C.C., Wise, W.R., Klopp, R.A., and P.B. Bedient "In Situ Source Release Mechanism Study at an Aviation Gasoline Spill Site: Traverse City, Michigan" *Proceedings of the Fourth National Outdoor Action Conference on Aquifer Restoration, Ground Water Monitoring and Geophysical Methods*, Las Vegas, NV, pp. 459-473 (May 1990).
61. Hopkins, L.P., Newell, C.J., and P.B. Bedient "A Hydrogeologic Database for the Hazardous Waste Regulatory Modeling" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water Conference*, National Water Well Association, Houston, TX, pp. 265-279 (November 1989).
62. Alder-Schaller, S.E. and P.B. Bedient "Evaluation of the Hydraulic Effect of Injection and Pumping Wells on In Situ Bioremediation" *Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water Conference*, National Water Well Association, Houston, TX, pp. 191-201 (November 1989).
63. Smythe, J.M., Bedient, P.B., and R.A. Klopp "Cone Penetrometr Technology for Hazardous Waste Site Investigations" *Proceeding of the Second National Outdoor Action Conference on Aquifer Restoration, Ground Water Monitoring and Geophysical methods*, Association of Ground Water Scientists and Engineers, Las Vegas, NV, pp. 71-94 (1989).
64. Rifai, H.S. and P.B. Bedient "Bioremediation Modeling of a Pilot Scale Field Experiment" *Proceedings of the National Water Well Association on Solving Ground Water Problems with Models*, Indianapolis, IN, pp. 1187-1203 (1989).
65. Wheeler, M.F., Dawson, C., and P.B. Bedient "Numerical Modeling of Subsurface Contaminant Transport with Biodegradation Kinetics" *Proceedings of the NWWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water*, Houston, TX, pp. 471-489 (1987).
66. Newell, C.J. and P.B. Bedient "Development and Application of a Ground Water Modeling Database and Expert System" *Proceedings of the NWWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water*, Houston, TX, pp. 559-578 (1987).
67. Rifai, H.S. and P. B. Bedient "BIOPLUME II - Two Dimensional Modeling for Hydrocarbon Biodegradation and *In Situ* Restoration" *Proceedings of the NWWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water*, Houston, TX, pp. 431-450 (1987).
68. Wheeler, M.F., Dawson, C.N., and P.B. Bedient "Numerical Simulation of Microbial Biodegradation of Hydrocarbons in Ground Water" *Proceedings of the NWWA/IGWMC Conference on Solving Ground Water Problems with Models*, Denver, CO, February 10-12, Vol. 1, pp. 92-109 (1987).
69. Chiang, C.Y. and P.B. Bedient "Simplified Model for a Surcharged Stormwater System" *Proceedings of the Third Int'l Conf. on Urban Storm Drainage*, Goteborg, Sweden, pp. 387-396 (1985).
70. Wang, T.H., Curran, C.M., Bedient, P.B., and M.B. Tomson "Ground Water Contamination at Conroe Creosote Waste Disposal Site" *Proceedings of the Second Int'l Conf. on Ground Water Quality Research*, OSU University Printing Services, Stillwater, OK, pp. 50-52 (1985).
71. Borden, R.C., Bedient, P.B., and T. Bouvette "Modeling Ground Water Transport at Conroe Creosote Waste Site" *Proceedings of the Second Int'l Conf. on Ground Water Quality Research*, OSU University Printing Services, Stillwater, OK, p. 88-90 (1985).

72. Todd, D.A. and P.B. Bedient "Use of Qual-II to Model Stream Protection Alternatives" *Proceedings of the ASCE 1984 National Conference on Environmental Engineering*, Los Angeles, CA, June 1984, pp. 60-65 (1984).

Invited Lectures (Recent)

1. Bedient, P.B., SSPEED Conference. Chair and Organizer, "*Hurricane Ike, Revisited*," September 14, 2009, Houston, Texas.
2. 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).
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., 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.
5. Bedient, P.B. (June, 2008) Plan for the Dominican Republic Flood Study, before the Ministers of Education, Environment, and Economic Development.
6. Bedient, P.B. "Advanced Flood Alert Systems in Texas" International Disaster Response Conference, Daves, Switzerland, August 28, 2006.
7. Bedient, P.B. "IP2 Flood Alert System for Houston" CASA Meeting NSF Review, UMASS. April, 2006.
8. 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.
9. Bedient, P.B. "Living with Severe Storms in the Gulf Coast- Scientia Lecture" Rice University, Houston, TX. (September 2005).
10. 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)
11. 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.
12. 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.
13. Bedient, P.B. "Impacts of Climate Change on Transportation Systems and Infrastructure" Gulf Coast Study, Lafayette, LA. (May 2005)
14. 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).

15. 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)
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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
22. Benavides, J.A. and P.B. Bedient "Improving the Lead-Time and Accuracy of a Flood Alert System in an Urban Watershed" 2003 AWRA Annual Conference, San Diego, California, November 2003.
23. Whitko, A.N. Bedient, P.B., and S. Johnson "Sustainable Flood Control Strategies in the Woodlands – Thirty Years Later" 2003 AWRA Annual Conference, San Diego, California, November 2003.
24. Safiolea E., Hovinga, R., and P.B. Bedient "Impact of Development Patterns on Flooding in Northwest Houston using LIDAR Data" 2003 AWRA Annual Conference, San Diego, California, November 2003
25. Benavides, J.A. and P.B. Bedient "Improving the Performance of a Flood Alert System Designed for a Rapidly Responding Urban Watershed" 2003 Conference on Flood Warning Systems Technologies and Preparedness, Dallas, Texas. October 2003.
26. Bedient, P.B., Holder, A., and Baxter Vieux "A Radar-Based Flood Alert System (FAS) Designed for Houston, TX" *International Conference on Urban Storm Drainage*, Portland, OR, September 2002.
27. Holder, A., Stewart, E., and P.B. Bedient "Modeling an Urban Drainage System with Large Tailwater Effects under Extreme Rainfall Conditions" *International Conference on Urban Storm Drainage*, Portland, OR, September 2002.
28. Glenn, S., Bedient, P.B., and B. Vieux "Analysis of Recharge in Ground Water Using NEXRAD in a GIS Format" *AWRA Summer Specialty Conference*, Keystone, CO, July, 2002.

29. Bedient, P.B. "Flood ALERT System (FAS) for Brays Bayou and the TMC" T.S. Allison: A Brays Bayou Event, Rice University Conference Presentation, November 13, 2001.
30. Bedient, P.B. "Flood ALERT System for the Texas Medical Center" Hurricanes and Industry, Houston Conference Presentation, November 7, 2001.
31. Bedient, P.B. and J.A. Benavides "Analyzing Flood Control Alternatives for the Clear Creek Watershed in a Geographic Information Systems Framework" presented at ASCE's EWRI Spring 2001 World Water & Environmental Resources Congress Conference.
32. Hoblit, B.C., Bedient, P.B., B.E. Vieux, and A. Holder "Urban Hydrologic Forecasting: Application Issues Using WSR-88D Radar" *Proceedings American Society of Civil Engineers Water Research, Planning and Management 2000 Conference*, Minneapolis, MN, August 2000.
33. Spexet, A., Bedient, P.B., and M. Marcon "Biodegradation and DNAPL Issues Associated with Dry Cleaning Sites" *Proc. Natural Attenuation of Chlorinated Solvents, Petroleum and Hydrocarbons Conference*, Bruce Alleman and Andrea Leeson eds., 5(1), pp. 7-11, Battelle Press, Columbus, Ohio, 1999.