

# CURRICULUM VITAE

July 2008

## NAME

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Professor

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## EDUCATION

Ph. D.	Rice University	1989	Environmental Engineering <i>Dissertation: Numerical Techniques for Modeling In Situ Bioremediation and Biodegradation of Organic Contaminants in Ground Water</i>
M. S.	Rice University	1985	Environmental Engineering <i>Thesis: Optimization of Lake Conroe Operations for Downstream Flood Control</i>
B. E.	American University of Beirut	1982	Civil Engineering

## PROFESSIONAL EXPERIENCE

2007 – present	Professor, Department of Civil and Environmental Engineering, Cullen College of Engineering, University of Houston, Houston, TX  Interim Associate Dean for Undergraduates – Fall 2007  Co-Director, SSPEED Center (Severe Storm Prediction, Education, Evacuation from Disaster)
2001 – 2007	Associate Professor, Department of Civil and Environmental Engineering, Cullen College of Engineering, University of Houston, Houston, TX
1997 – 2001	Assistant Professor, Department of Civil and Environmental Engineering, Cullen College of Engineering, University of Houston, Houston, TX

- 1997 – 1998      Adjunct Assistant Professor, Department of Environmental Science and Engineering, Rice University, Houston, TX
- 1994 – 1997      Executive Director, Energy and Environmental Systems Institute, Rice University, Houston, TX
- 1994 – 1997      Faculty Fellow, Department of Environmental Science and Engineering, Rice University, Houston, TX
- 1989 – 1994      Research Associate, Department of Environmental Science and Engineering, Rice University, Houston, TX
- 1986 – 1989      Doctoral Research Assistant, Department of Environmental Science and Engineering, Rice University, Houston, TX
- 1985 – 1986      Senior Design Engineer, Edminster, Hinshaw, Russ & Associates, Houston, TX
- 1984 – 1985      Consultant, Houston, TX
- 1983 – 1984      Masters Research Assistant, Department of Environmental Science and Engineering, Rice University, Houston, TX
- 1983  
(Spring/Summer)      Masters Research Assistant, Oklahoma State University, Stillwater, OK
- 1980 (Summer)      Trainee Engineer, Midmac Engineering Co., Houston, TX

## **CONTINUING EDUCATION**

Co-Organizer and Presenter, *Gulf Coast Severe Storm and Hurricane Preparedness Workshops*, May, June, September, and October 2008.

Co-Organizer and Presenter, *AE Libya Knowledge Transfer Program*, 2008 – 2009.

Lecturer and Course Organizer, *Natural Attenuation of Fuel Hydrocarbons and Chlorinated Solvents: Processes, Monitoring and Modeling with BIOSCREEN and BIOPLUME III*, UH Training Course, February, May 2004, and May 2006, held at University of Houston, Houston, Texas.

Lecturer and Course Organizer, *Remediation by Natural Attenuation*, ASTM Training Course, March, May, September, December 2001, Mar, May, Sept. and Nov. 2002, held at University of Houston, Houston, Texas.

Lecturer, *Risk Based Corrective Action for USTs: The ASTM Guidelines*, ASTM Training Course presented to Exploration and Production Audience, August 2001, Houston, Texas.

Presenter, *NEXRAD Radar Applications in Engineering Hydrology and Water Resources*, Short course at Rice University, Oct 26-27, 2000, Houston, Texas.

Course Organizer, *The Texas Risk Reduction Rules*, Offerings in 5 cities in Texas (Houston, Dallas, San Antonio, Corpus Christi and Midland), April – May 2000.

Lecturer, *Natural Attenuation of Fuel Hydrocarbons and Chlorinated Solvents: Processes, Monitoring and Modeling with BIOSCREEN and BIOPLUME III*, National Ground Water Association Training Course, Jan. 99, May 99 and Sept. 99.

Lecturer, *Remediation by Natural Attenuation*, ASTM Training Course, Nov. 98.

Lecturer, *Modeling Natural Attenuation Using the BIOPLUME III Decision Support System*, Air Force Center for Environmental Excellence, Nov 98, San Antonio, Texas.

Course Organizer, *Risk Based Corrective Action for USTs: The ASTM Guidelines*, June 98, Nov. 98, Mar. 99 and June 99, held at University of Houston, Houston, Texas.

Course Organizer and Lecturer, *Risk Based Corrective Action for USTs: The ASTM Guidelines*, June 96, Aug. 96, Sept. 96 (2 courses), Dec. 96, March 97, Nov. 97, Mar. 98, held at Rice University (1996 courses and Mar 97) and University of Houston (Nov 97 and Mar 98), Houston, Texas.

Course Co-Organizer, *Train the Trainer: the ASTM RBCA Toolkit*, ASTM Training Course, Jan. 98.

Lecturer, *Modeling Natural Attenuation Using the BIOPLUME III Decision Support System*, (2,1-day sessions), Air Force Center for Environmental Excellence, Oct. 97, San Antonio, Texas.

Lecturer, *Risk Based Corrective Action Applied at Petroleum Release Sites*, ASTM Training Course, April 96, November 96, January 97, August 97, Nov. 97, Dec. 98, Mar. 99.

Lecturer, *Intrinsic Remediation: Principles, Applications and Case Studies*, INET Training Course, October 1995, February 96.

Course Organizer and Lecturer, *BIOPLUME II Modeling*, U. S. Corps of Engineers, May 1995.

Lecturer, *U. S. Air Force Environmental Restoration Technology Transfer Symposium*, January 1993 and November 1994, San Antonio, Texas.

Lecturer, *BIOPLUME II Modeling*, Nov. 93, held at Engineering Science headquarters, Houston, Texas.

Lecturer, *Bioremediation of Contaminated Ground Water*, Superfund University Training Institute, May 1993.

Lecturer, *Subsurface and Ground Water Modeling*, Superfund University Training Institute, September 1991, March and November 1992, March 1993.

Lecturer, *Biodegradation Modeling*, May 1988, held at Dow Chemical Company headquarters, Houston, Texas.

Lecturer, *Transport and Fate of Contaminants in Subsurface*, Superfund University Training Institute, January and June 1991, October and December 1992, May 1993.

Lecturer, *Ground Water Modeling*, November 1987, March 1988, November 1988, March 1989, held at Rice University, Houston, Texas.

Lecturer, *Introduction to Ground Water*, March 1987, March 1988, held at Rice University, Houston, Texas.

### **Student Awards**

PhD student **Nathan Howell** won 3<sup>rd</sup> place student paper award, WEAT/AWWA (Texas Section) Texas Water 2008 Conference University Forum Technical Session, Mar 25 – 28, San Antonio, TX, 2008.

PhD student **Nathan Howell** was awarded the National Association of Energy Engineers Foundation and the Malloy Endowed Graduate Fellowship, 2007.

Master's student **Yaa Amoah** was awarded a \$3,000 scholarship from the Gulf Coast Chapter of the Air and Waste Management Association (AWMA) for fall 2007 and Spring 2008.

Master's student **Lisa Grecho** received a \$1,000 scholarship from the Civil and Environmental Engineering Department at the University of Houston for Spring 07, Fall 08, and Spring 08.

PhD student **Anuradha Desai** received a \$3,000 Environmental Science Scholarship from Air and Waste Mgmt Association for 2007-2008 and a \$1,000 graduate leadership scholarship from Civil and Environmental Engineering at the University of Houston for 2007-2008.

Ph. D. student **Anuradha Desai** won 1st place award for her paper: *Bacteria Characterization in Houston Metropolitan Area* at the TAEP (Texas Association of Environmental Professionals) 1<sup>st</sup> Annual Conference *Environmental Challenges and Innovations Conference: Gulf Coast 2007*, Feb 15, Houston, Texas, 2007.

Ph. D. student **Tina Petersen** received a \$1,000 graduate fellowship from Civil and Environmental Engineering at University of Houston for 2004.

Masters student **Paul LaWare** won third place in the 2002 Statewide Texas Water Pollution Control Federation Student Paper Contest.

Undergraduate student **Doug Haude** won second place in the technical paper presentation competition held at the Spring State ASCE convention held in Arlington, TX, 2002.

**Five students** recognized in the 2000 edition of *Who's Who Among Students in American Universities* (Feras Alkasab, Kevin R. Collins, Paul R. LaWare, Monica P. Suarez, and Charelle B. Webb).

Masters student **Monica Suarez** won 3rd place in the 1999 Statewide Texas Water Pollution Control Federation Student Paper Contest.

Undergraduate Research Assistant **Kevin Collins** won a UH Scholar Award for the academic year 2000.

## AWARDS, HONORS, AND RECOGNITION

Member, Texas Commission on Environmental Quality (TCEQ) Task Force on Bacteria TMDLs, 2006-2007.

Editor-in-Chief, *Bioremediation Journal*, Taylor and Francis, January 2002-present

Recipient of the 2001 Wesley W. Horner Award for Best Paper from the American Society of Civil Engineers for *Rifai et al., Modeling Natural Attenuation of Fuels with BIOPLUME III, ASCE Journal of Environmental Engineering, 126(5):428-438, 2000.*

Member of the Texas Natural Resource and Conservation Commission (TNRCC) Committee developing Natural Attenuation Guidance under the Texas Risk Reduction Rules (TRRP) program (TRRP-33), 2000-2001.

Member of the U. S. EPA Science Advisory Board Environmental Engineering Committee (FY00) – Natural Attenuation Subcommittee, 2000-01.

Invited Panelist, DuPont Workshop on Modeling and Management of Emerging Environmental Issues, Simulation of Halogenated Hydrocarbons in the Subsurface Panel, 2000.

Guest Editor, Special 3-Part Issue on Natural Attenuation, *Bioremediation Journal*, 1998-1999.

Associate Editor, *Bioremediation Journal*, CRC Press, 1997-2001.

Co-Chair, ASTM Committee on Remediation by Natural Attenuation Standard for Chlorinated Solvents and other Compounds, 1998-date.

Peer Review Panel Member for Lawrence Livermore National Laboratory Study *Behavior of Chlorinated Volatile Organic Compound Plumes: Data Collection and Analysis Methods*, 1997-1998.

National trainer for the *ASTM Remediation by Natural Attenuation Standard*, 1998-date.

National trainer for the *ASTM Risk Based Corrective Action Standard*, 1996-date.

Eleanor and Mills Bennett Fellowship in Hydrology, Rice University fellowship awarded to outstanding graduate students, 1987-1989.

Ralph Budd Award for Best Dissertation in Engineering, Rice University highest award to graduating Ph.D. students in engineering, 1989.

## **SPECIAL HONORS FOR RESEARCH**

Union Carbide Unrestricted Research Grant \$25,000 annually for 1997, 1998, 1999 and 2000.

## **PUBLICATIONS**

### **Refereed Journals**

Petersen, T. M., H. S. Rifai, and R. Stein, Bacteria Load Estimator Spreadsheet Tool (BLEST) for Modeling Spatial Escherichia Coli Loads to an Urban Bayou, *ASCE Journal of Environmental Engineering*, Accepted, 2008.

Howell, N., M. P. Suarez, H. S. Rifai, and L. Koenig, Concentrations of Polychlorinated Biphenyls in Water, Sediment, and Aquatic Biota in the Houston Ship Channel, Texas, *Chemosphere*, 70(4), 593-606, 2008.

Yeager, K. M., Santschi, P. H., H. S. Rifai, M. P. Suarez, R. Brinkmeyer, C-C. Hung, K. Schindler, M. Andres, and E. Weaver, Dioxin Chronology and Fluxes in Sediments of the Houston Ship Channel, Texas: Influences of Non-Steady State Sediment Transport and Total Organic Carbon, *Environmental Science and Technology*, 41, 5291-5298, 2007.

Ling, M., and H. S. Rifai, Modeling Natural Attenuation with Source Control at a Dry-Cleaner Site, *Groundwater Monitoring Review and Remediation*, 27 #1, 108-121, 2007.

Suarez, M. P., H. S. Rifai, J. Schimek, M. Bloom, P. Jensen, and L. Koenig, Dioxin in Stormwater Runoff in Houston, TX, *ASCE Journal of Environmental Engineering*, v. 132, #12, 1633-1643, 2006.

Petersen, T., M. P. Suarez, H. S. Rifai, P. Jensen, Y-C. Su, and R. Stein, Status and Trends of Fecal Coliform Indicator Bacteria in Two Urban Watersheds, *Water Environment Research*, v78, #12, 2340-2355, 2006.

LaWare, P. and H. S. Rifai, Modeling Fecal Coliform Contamination from Non Point Sources in the Rio Grande, *Journal of the American Water Resources Association*, v42, #2, 337-356, 2006.

Correa, O. E., L. Raun, H. S. Rifai, M. P. Suarez, T. Holsen, and L. Koenig, Depositional Flux of Polychlorinated Dibenzofurans in an Urban Setting, *Chemosphere*, 64, 1550-1561, 2006.

Hausman, S., and H. S. Rifai, Modeling Remediation Time Using Natural Attenuation at a Dry Cleaner Site, *Remediation*, vol 16, No. 1, 5-31, 2005.

Suarez, M. P., H. S. Rifai, R. Palachek, K. Dean, and L. Koenig, Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans in Houston Ship Channel Tissue and Sediment, *Environmental Engineering Science*, vol 2, No. 6, 891-906, 2005.

Suarez, M. P., H. S. Rifai, R. Palachek, K. Dean, and L. Keonig, Distribution of Polychlorinated Dibenzo-P-Dioxins and Dibenzofurans in Suspended Sediments, Dissolved Phase and Bottom Sediment in the Houston Ship Channel, *Chemosphere*, vol 62, No.3, 417-429, 2005.

Petersen, T., H. S. Rifai, M. P. Suarez, and R. Stein, Bacteria Loads from Point and Non-Point Sources in an Urban Watershed, *ASCE Journal of Environmental Engineering*, vol. 131, No. 10, 1414-1425, 2005.

Raun, L., O. Correa, O., H. Rifai, M. Suarez and L. Koenig, Statistical Investigation of Polychlorinated Dibenzo-pdioxins and Dibenzofurans in the Ambient Air of Houston, Texas, *Chemosphere*, 60:973-989, 2005.

Ling, M., H. S. Rifai, and C. J. Newell, Optimizing Long-Term Monitoring Networks Using Delaunay Triangulation Spatial Analysis Techniques, *Environmetrics*, 16:635-657, 2005.

Rifai, H. S., and T. Rittaler, Modeling Natural Attenuation of BTEX with Analytical and Numerical Models, *Biodegradation*, 16 (4): 291-304, 2005.

Ling, M. H. S. Rifai, J. J. Aziz, C. J. Newell, J. R. Gonzales, and J. M. Santillan, Strategies and Decision-Support Tools for optimizing Long-Term Groundwater Monitoring Plans-MAROS 2.0, *Bioremediation Journal*, vol. 8, 3-4, 109-128, 2004.

Correa, O. H. S. Rifai, L. Raun, M. P. Suarez, and L. Koenig, Concentrations and Vapor-Particle Partitioning of Polychlorinated Di-benzo-p-dioxins and Dibenzofurans in Ambient Air of Houston, TX, *Atmospheric Environment*, 38: 6687-6699, 2004.

Suarez, M. P., H. S. Rifai, T. J. Rittaler, and S. Hausman, Natural Attenuation of Chlorinated Solvent Plumes at Texas Dry-Cleaners, *Remediation*, v. 14, No. 3, 7 – 31, 2004.

Mehdizadeh, F. and H. S. Rifai, Modeling Point Source Plumes at High Altitudes Using a Modified Industrial Source Complex Model, *Atmospheric Environment*, 38, 821-831, 2004.

Fiorenza, S. and H. S. Rifai, Review of MTBE Biodegradation and Bioremediation, *Bioremediation Journal*, 7(1):1-35, 2003.

Aziz, J. J., M. Ling, H. S. Rifai, C. J. Newell, and J. R. Gonzales, MAROS: a Decision Support System for Optimizing Monitoring Plans, *Ground Water*, v41, No. 3, 355-367, 2003.

Ling, M., Rifai, H. S., Newell, C. J., Aziz, J. J. and Gonzales, J. R., Groundwater Monitoring Plans at Small Scale Sites—An Innovative Spatial and Temporal Methodology, *Journal of Environmental Monitoring*, vol. 5, No. 1, 126-134, 2003.

Fiorenza, S., M. P. Suarez and H. S. Rifai, MTBE in Groundwater: Status and Remediation, *ASCE Journal of Environmental Engineering*, vol. 128, No. 9, 773 – 781, 2002.

Suarez, M. P. and H. S. Rifai, Evaluation of BTEX Remediation by Natural Attenuation at a Coastal Facility, *Ground Water Monitoring and Remediation*, 22(1):62-77, 2002.

Suarez, M. P. and H. S. Rifai, Modeling Natural Attenuation of Total BTEX and Benzene Plumes with Different Kinetics, *Ground Water Monitoring and Remediation*, 24(3):53-68, 2002.

Rifai, H. S., P. B. Bedient, and G. L. Shorr, Monitoring Hazardous Waste Sites: Characterization and Remediation Considerations, *Journal of Environmental Monitoring*, 2(3): 199-212, 2000.

Rifai, H. S., C. J. Newell, J. R. Gonzales, and J. T. Wilson, Modeling Natural Attenuation of Fuels with BIOPLUME III, *ASCE Journal of Environmental Engineering*, 126(5): 428-438, 2000.

Rifai, H. S., S. M. Brock, K. B. Ensor, and P. B. Bedient, Determination of Low-Flow Characteristics for Texas Streams, *ASCE Journal of Water Resources Planning*, 126(5): 310-319, 2000.

Hopkins, L. P., K. B. Ensor and H. S. Rifai, Empirical Evaluation of Ambient Ozone Interpolation Procedures to Support Exposure Models, *Journal of the Air and Waste Management Association*, v. 49: 839-846, 1999.

Suarez, M. P. and H. S. Rifai, Biodegradation Rates for Fuel Hydrocarbons and Chlorinated Solvents in Groundwater, *Bioremediation Journal*, 3(4): 337-362, 1999.



Rifai, H. S., L. A. Hendricks, K. Kilborn, and P. B. Bedient, A Geographical Information System (GIS) User Interface for Delineating Wellhead Protection Areas, *Ground Water*, 31(3): 480-488, 1993.

Bedient, P. B., and H. S. Rifai, Ground Water Contaminant Modeling for Bioremediation: A Review, *Journal of Hazardous Materials*, 32:225-243, 1992.

Rifai, H. S., and P. B. Bedient, Comparison of Biodegradation Kinetics with an Instantaneous Reaction Model for Groundwater, *Water Resources Research*, 26 (4), 637-645, 1990.

Rifai, H. S., P. B. Bedient, J. T. Wilson, K. M. Miller, and J. M. Armstrong, Biodegradation Modeling at Aviation Fuel Spill Site, *ASCE Journal of Environmental Engineering*, 114 (5), 1007-1029, 1988.

### **Pending Refereed Journals**

Petersen, T. M., H. S. Rifai, and R. Stein, Modeling Escherichia Coli and its Sources in an Urban Bayou with Hydrologic Simulation Program in Fortran (HSPF), *ASCE Journal of Environmental Engineering*, Submitted, July 2007.

### **Editorials and Journal Discussions**

Rifai, H. S., Dehalococoides Ethenogenes as Indicators for Natural Attenuation, Monitored Natural Attenuation Forum Panel Discussion, *Remediation*, 109-116, Winter 2003.

Rifai, H. S., A Continued Vision for Bioremediation, *Bioremediation Journal*, 2002.

Rifai, H. S., One Hundred Years of Natural Attenuation, *Bioremediation Journal*, 2 (3&4): 217-219, 1998.

### **Invited Papers**

Jensen, P., H. Rifai, T. Battenfield, and S. Payne, Lessons Learned from Texas Bayous: Identifying Bacteria Sources, *Public Works*, October 2001.

Rifai, H. S. and M. P. Suarez, The RBCA Success Story, *Environmental Protection*, 26-30, December 2000.

Rifai, H. S. and P. LaWare, A Woody Invader: Mapping the Spread of Chinese Tallow in South Houston Using Landsat MultiSpectral Scanner Data, *Geospatial Solutions*, 29-30, November 2000.

Rifai, H. S., C. J. Newell, and P. B. Bedient, Getting to the Nonpoint Source with GIS, *Civil Engineering*, 44-46, 1993.

Rifai, H. S., C. J. Newell, and P. B. Bedient, GIS Enhances Water Quality Modeling, *GIS World*, 52-55, 1993.

Kilborn, K., H. S. Rifai, and P. B. Bedient, Connecting Groundwater Models and GIS, *Geo Info Systems*, 26-31, 1992.

### **Peer-Reviewed Government and Industry Reports**

Co-authored TNRCC Regulatory Guidance, Remediation Division, RG-366/TRRP-33, Monitored Natural Attenuation Demonstrations, October 2001.

Co-Authored EPA SAB Report, Monitored Natural Attenuation: *USEPA Research Program—An EPA Science Advisory Board Review*, EPA-SAB-EEC-01-004, May 2001, 46 pp., 2001.

Newell, C. J., H. S. Rifai, J. T. Wilson, J. A. Connor, J. A. Aziz, and M. P. Suarez, Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies, EPA/540/S-02/500, 27 pp, Nov. 2002.

Rifai, H. S., and C. J. Newell, Estimating First Order Decay Coefficients for Petroleum Hydrocarbon Biodegradation, *API (American Petroleum Institute) Technical Brief*, in press, American Petroleum Institute (API), Washington, DC, 16 pp., 2000.

Newell, C. J., H. S. Rifai, P. B. Bedient, F. Shipley, and R. McFarlane, *The State of the Bay: A Characterization of the Galveston Bay Ecosystem*, Galveston Bay National Estuary Program (GBNEP-44), Clear Lake, TX, 232 p., 1994.

Newell, C. J., H. S. Rifai, and P. B. Bedient, *Characterization of Non-Point Sources and Loadings to Galveston Bay*, Galveston Bay National Estuary Program (GBNEP-15), Clear Lake, Houston, 33 pp., 1992.

Newell, C. J., J. F. Haasbeek, L. P. Hopkins, S. E. Alder-Schaller, H. S. Rifai, P. B. Bedient, G. A. Gorry, OASIS: Parameter Estimation System For Aquifer Restoration Models, User's Manual Version 2.0, EPA/600/S8-90/039, 1990.

Rifai, H. S., P. B. Bedient, and J. T. Wilson, BIOPLUME Model for Contaminant Transport Affected by Oxygen Limited Biodegradation, EPA/600/M-89/019, 1989.

### **Conference Proceedings**

Suarez, M. P., Dean, K. Patek, J., Palachek, R., Rifai, H. S., and Izquierdo, A., Development of a Sediment-Water Model for Dioxin in the Houston Ship Channel, Texas, *Proceedings of Water Environment Federation TMDL 2007 Conference*, June 24-27, Bellevue, WA, 2007.

Rifai, H. S., T. Petersen, G. C. Villareal, and R. Stein, Load Estimates Modeling and Allocations for Bacteria TMDL Development, *Proceedings of Water Environment Federation TMDL 2007 Conference*, June 24-27, Bellevue, WA, 2007.

Rifai, H. S., C. J. Newell, A. M. Spexet, and J. T. Wilson, Development of Bioplume 4 Model for Fuels and Chlorinated Solvent Biordegradation, *Proceedings of the 8<sup>th</sup> In Situ and On-Site Bioremediation Conference*, June 6-9, Baltimore, MD, 2005.

Dean, K. E., R. M. Palachek, H. S. Rifai, M. P. Suarez, S. Hausman, and L. Koenig, Site-Specific Water Quality Target for a Fish Contaminant: Application of Sediment, Water, and Tissue Targets based on measured Dioxin Partitioning relationships, in *Proceedings of Water Environment Federation (WEF) TMDL 2003 Conference*, Nov. 16-18, Chicago, IL, 2003.

Rifai, H. S., M. P. Suarez, T. Petersen, P. Jensen, Y-c. Su, and R. Stein, Development of An Urban Indicator Bacteria TMDL: Modeling and Allocations, in *Proceedings of Water Environment Federation (WEF) TMDL 2003 Conference*, Nov. 16-18, Chicago, IL, 2003.

Bloom, M. F., P. Jensen, M. Heaney, H. S. Rifai, M. P. Suarez, and L. Koenig, Assessment of Particulate and Dissolved Dioxin Concentrations in Storm Water Runoff to Houston-Area Waterways Using High Volume Sampling, in *Proceedings of Water Environment Federation (WEF) TMDL 2003 Conference*, Nov. 16-18, Chicago, IL, 2003.

Rifai, H. S., M. P. Suarez, R. palachek, K. Dean, P. Jensen, M. Bloom, and L. Koenig, Development of a dioxin TMDL for the Houston Ship Channel in Texas, in *Proceedings of Water Environment Federation (WEF) TMDL 2003 Conference*, Nov. 16-18, Chicago, IL, 2003.

Rifai, H. S., G. L. Shorr, and A. Bagga, MTBE Behavior at Field Sites and Plume Characterization, in *Proceedings 2003 NGWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration*, Aug. 19-22, Costa Mesa, CA, National Ground Water Association, Westerville, OH, 2003.

Ling, M., H. S. Rifai, J. J. Aziz, C. J. Newell, and J. R. Gonzales, Groundwater Monitoring Plans for BTEX and MTBE Plumes, in *Proceedings 2003 NGWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration*, Aug. 19-22, Costa Mesa, CA, National Ground Water Association, Westerville, OH, 2003.

Ling, M., and H. S. Rifai, Assessing Uncertainty in Groundwater Model Predictions at a Chlorinated Solvents Contaminated Site, in *Proceedings of the EWRI World Water and Environmental Resources Conference 2003*, Philadelphia, PA, June 22 - 26, 2003.

Su, Y. C., P. Jensen, T. Petersen, H. S. Rifai, and R. Stein, Bacteria Total Maximum Daily Load Modeling for Buffalo and Whiteoak Bayous in Houston, in *Proceedings, Texas Water 2003*, Corpus Christi, TX, April 1-3, 2003.

M. Ling, J. J. Aziz, C. J. Newell, H. S. Rifai, J. R. Gonzales, and J. Santillan, LTM: Spatial / Temporal Data Management, Analysis, and Visualization, in *Proceedings of the EWRI World Water and Environmental Resources Conference 2003*, Philadelphia, PA., June 22 - 26, 2003.

Aziz, J. J., C. J. Newell, H. S. Rifai, M. Ling, and J. Gonzales, Effective and Efficient LTM: Spatial/temporal Data Analysis and Visualization, in *Proceedings 7th International In Situ and On-Site Bioremediation Symposium Orlando, Florida*, June 2-5, 2003.

Rifai, H. S., M. P. Suarez, T. Petersen, P. Jensen, Y.C. Su, and R. Stein, Urban Indicator Bacteria TMDL Development, in *Proceedings National TMDL Science and Policy Conference*, Phoenix, AZ, November 13-16, 2002.

Aziz, J. J., C. J. Newell, H. S. Rifai, M. Ling, and J. Gonzales, MAROS: Monitoring and Remediation Optimization System Decision Support Tool and Application, in *Proceedings of the 2002 NGWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration*, Nov. 6-8, Atlanta, GA, National Ground Water Association, Westerville, OH, 2002.

Ling, M., H. S. Rifai, C. J. Newell, J. J. Aziz, and J. R. Gonzales, A Methodology for Ground Water Monitoring Plan Optimization at Small-Scale Natural Attenuation Sites, in *Proceedings of the 2002 NGWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration*, Nov. 6-8, Atlanta, GA, National Ground Water Association, Westerville, OH, 2002.

Ling, M., H. S. Rifai, C. J. Newell, J. J. Aziz, and J. R. Gonzales, An Integrated Optimization Methodology for Designing Groundwater Monitoring Plans, in *Proceedings, 1<sup>st</sup> Annual Environmental and Water Resources Systems Analysis (EWRSA) Symposium*, Roanoke, Virginia, May 19-22, 2002.

Shorr, G. L. and H. S. Rifai, Characterizing the Intrinsic Remediation of MTBE at Field Sites in Texas, in *Proceedings of 3<sup>rd</sup> International Conference on Remediation of Chlorinated and Recalcitrant Compounds*, Editors: A. R. Gavaskar and A. S. C. Chen, Monterrey, California, May 20-23, 2002.

Shorr, G. L., and H. S. Rifai, Assessing the Potential of MTBE Natural Attenuation at Field Sites in Texas, in *Proceedings of the National Conference on Environmental Science and Technology*, Greensboro, NC, September 8-10, 2002.

Shorr, G. L., and H. S. Rifai, A Closer Look at MTBE Behavior within the Subsurface, in *Proceedings of the International Petroleum Environmental Conference*, Albuquerque, NM, October 22-25, 2002.

Bagga, A., and H.S. Rifai, *In Situ Aerobic Bioremediation of MTBE*, in *Proceedings of the National Conference on Environmental Science and Technology*, Greensboro, NC, September 8-10, 2002.

Bagga, A., and H.S. Rifai, *In Situ Aerobic Bioremediation of MTBE: A Pilot Scale Field Study*, in *Proceedings of 9th International Petroleum Environmental Conference*, Albuquerque, NM, October 21-25, 2002.

Rifai, H. S., M. P. Suarez, and C. Webb, Natural Attenuation of Chlorinated Solvents at Dry Cleaner Sites, in *Proceedings, 8<sup>th</sup> International Petroleum Environmental Conference*, Houston, Texas, November 6-9, 2001.

Aziz, . J. J., C. J. Newell, H. S. Rifai, M. Ling, and J. Gonzales, MAROS: Decision Support Software for Designing Monitoring Plans, *AIChE Topical Conference on Remedial Process Optimization*, Atlanta, GA, March 2000.

Aziz, J. J., C. J. Newell, H. S. Rifai, Ling, M., and J. R. Gonzales, MAROS: Decision Support Software for Designing Monitoring Plans, in *Proceedings, ASCE 2000 Joint Conference on Water Resources Engineering and Water Resources Planning and Management*, Minneapolis, Minnesota, July 30-August 2, 2000.

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Suarez, M. P. and H. S. Rifai, Estimation of Biodegradation Rates for Natural Attenuation at Hazardous Waste Sites, in *Proceedings, National Conference on Environmental Remediation Science and Technology*, Sept. 8-10, Greensboro, NC, pp. 223-231, Battelle, Dublin, OH, 1998.

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### **Invited Presentations**

Rifai, H. S., Modeling Water Quality Using GIS, ESRI User Conference, University of Houston, Nov 13, Houston, Texas, 2007.

Rifai, H. S., Water-Borne Pollution Hazards in Urban Areas, Texas Homeland Security Conference, December 3-7, San Antonio, Texas 2007.

Rifai, H. S. (Plenary), Water Quality Challenges, 8<sup>th</sup> Biennial State of the Bay Symposium, January 23-25, Galveston, Texas 2007.

Rifai, H. S., Characterizing and Modeling Industrial and Pathogenic Pollutants in Urban Waterways, Presentation to the Engineering Leadership Board, November 10, College of Engineering, University of Houston, 2006.

Rifai, H. S., Dioxin Sources and Loads in the Houston Ship Channel, Seminar, October 10, Texas A&M Galveston, Galveston, Texas 2006.

Rifai, H. S., Houston Bayous: Issues and Concerns, Severe Storms – Impacts and Disaster Response in Gulf Coast Communities Conference, March 15 – 17, Rice University, Houston, Texas, 2006.

Rifai, H. S., Sources and Distribution of PCBs and Dioxins in the Houston Ship Channel, Seminar, November 14, Department of Civil and Environmental Engineering, Rice University, Houston, Texas, 2005.

Rifai, H. S., Bioremediation Journal: Past, Present and Future, Keynote Speaker, 8<sup>th</sup> In Situ and On Site Bioremediation Symposium, June 6-9, Baltimore, MD, 2005.

Rifai, H. S., PCBs and Dioxins in the Houston Ship Channel and Upper Galveston Bay, Citizen's State of the Bay Conference, September 10, Houston, Texas, 2005.

Rifai, H. S., Bacteria in Our Bayous and Dioxin in the Houston Ship Channel, Seminar November 4, Department of Civil and Environmental Engineering, Rice University, Houston, Texas, 2004.

Rifai, H. S., M. P. Suarez, R. Palachek, K. Dean, P. Jensen, M. Bloom, and L. Koenig, Dioxin Contamination in the Houston Ship Channel, Board Meeting of the Galveston Bay Estuary Program, April 22, Armand Bayou Nature Center, Texas, 2004.

Rifai, H. S., M. P. Suarez, R. Palachek, K. Dean, P. Jensen, M. Bloom, and L. Koenig, Dioxin Contamination in the Houston Ship Channel, Haden Road Community Advisory Panel, March 22, Houston, Texas, 2004.

Rifai, H. S., M. P. Suarez, R. Palachek, K. Dean, P. Jensen, M. Bloom, and L. Koenig, Baytown Area Community Advisory Panel, May 17, Houston, Texas, 2004.

Raun, L., O. Correa, H. S. Rifai, M. P. Suarez, and L. Koenig, Dioxin in Air, U. S. EPA Region 6 13<sup>th</sup> Annual Quality Assurance Conference, October 20-24, Dallas, Texas, 2003.

Rifai, H. S., Indicator Bacteria and their Causes and Sources in Houston Bayous, Texas A&M TWRI (Texas Water Resources Institute) Workshop on Identifying Bacterial Source Tracking Needs in Texas, May 6, Austin, TX, 2003.

Rifai, H. S., A. Bagga, Y. Choi, and G. Shorr, Characterizing the Intrinsic Remediation of MTBE at Chevron Sites, Presentation at Chevron Oxygenate Technology Transfer Workshop, May 15, Houston, TX, 2003.

Rifai, H. S., G. Shorr, and A. Bagga, Natural Attenuation and In Situ Bioremediation of MTBE, Presentation at Chevron Oxygenate Technology Transfer Workshop, June 25, Houston, TX, 2002.

Rifai, H. S., GIS Challenges in Hydrology, Mitigating Severe Weather Impacts in Urban Areas, National Symposium held in Houston, Texas, April 15-17, 2002.

Rifai, H. S., Evolutionary Trends in Environmental Research: Water Resources, Seminar at Rice University's Environmental Science and Engineering Department's 30-yr Anniversary Celebration, November 2, 2000.

Rifai, H. S., State-of-the-Art Techniques in Natural Attenuation of Groundwater Contamination, WEAT SE Section Meeting, November 16, 2000.

Rifai, H. S., Natural Attenuation of Fuels and Chlorinated Solvents, Seminar at Rice University, Department of Environmental Science and Engineering, March 28, 2000.

Rifai, H. S., Natural Attenuation of Fuels and Chlorinated Solvents, Seminar at University of Houston, Geosciences Department, March 31, 2000.

Rifai, H. S. and M. P. Suarez, Estimating Biodegradation Rates for Fuel Hydrocarbons and Chlorinated Solvents, NGWA/API Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration, November 17-19, Houston, TX, 1999.

Rifai, H. S., Natural Attenuation of Fuels and Chlorinated Solvents: Similarities and Differences, Presentation at the Texas Natural Resource Conservation Commission (TNRCC), Natural Attenuation of Chlorinated Solvents Seminar, August 12, Austin, TX, 1999.

Rifai, H. S., The Role of Intrinsic Remediation in Aquifer Cleanup, SETAC 19th Annual Meeting, Nov. 15 - 19, Charlotte, NC, 1998.

Rifai, H. S., Environmental and Infrastructure Applications with Remote Sensing and GIS, URISA Meeting, Aug. 27, Houston, TX, 1998.

Rifai, H. S., Intrinsic Remediation of Mixed Fuel/Chlorinated Solvent Sites, Union Carbide 5th Annual Technology Symposium, Jun10, S. Charleston, West Virginia, 1998.

Rifai, H. S., Natural Attenuation for Remediating Sites Contaminated with Fuels and Chlorinated Solvents, Texas Hazardous Waste Management Society Meeting, Jan 22, Houston, TX, 1998.

Rifai, H. S., Natural Attenuation Processes and Modeling, 3rd Annual Florida Remediation Conference, Nov. 12 - 13, Orlando, Florida, 1997.

Rifai, H. S., Natural Attenuation Processes and Modeling, Seminar in Chemical Engineering, University of Houston, Sept 26, Houston, Texas, 1997.

Rifai, H. S., Natural Attenuation of Fuels and Chlorinated Hydrocarbons in Ground Water, Seminar presented at the City of Houston Department of Public Works and Engineering, March 24, Houston, TX, 1997.

Rifai, H. S., Natural Attenuation of Fuels and Chlorinated Organics in Ground Water, Seminar in Civil and Environmental Engineering, Feb 27, University of Houston, Houston, Texas, 1997.

Rifai, H. S., Research in Environmental Science and Engineering, Presentation at Department of Natural Sciences of the University of Houston - Downtown Campus, April 4, Houston, Texas, 1996.

Rifai, H. S., Evaluation of a Pump-and-Treat Remediation System at the Plant 44 Site in Tucson, Arizona, Lawrence Livermore National Laboratory, Dec 10, Oakland, CA, 1996.

Rifai, H. S., Integration of Natural Attenuation and Risk Assessment: Modeling and Case Studies, *IBC's 2nd Annual International Symposium on Intrinsic Bioremediation*, Dec 3 - 4, Annapolis, MD, 1996.

Rifai, H. S., P. B. Bedient, and K. S. Burgess, Case Study: Plant 44, Tucson, Arizona, *EPA's Symposium on Natural Attenuation of Chlorinated Organics in Ground Water*, September 11 - 13, Dallas, TX, 1996.

Rifai, H. S., Modeling the Prediction and Validation of Intrinsic Remediation, Union Carbide 3rd Annual Technology Symposium, S. Charleston, West Virginia, November 6, 1996.

Rifai, H. S., Environmental Applications of Geographical Information Systems, Houston Area Chapter of the American Statistical Association, August, Houston, Texas, 1995.

Rifai, H. S., Modeling and Intrinsic Bioremediation, Intrinsic Bioremediation, Strategies for Effective Analysis, Monitoring and Implementation, *IBC's 1st Annual International Symposium on Intrinsic Bioremediation*, Oct 16 - 17, Annapolis, MD, 1995.

Rifai, H. S., C. J. Newell, J. Wilson, R. N. Miller, J. Gonzales, Modeling Natural Attenuation with Multiple Electron Acceptors, *1995 SIM Annual Meeting*, August 6 - 11, San Jose, CA, 1995.

Rifai, H. S., R. C. Borden, J. T. Wilson, and C. H. Ward, Intrinsic Bioattenuation for Substance Restoration," *In Situ and On-Site Bioreclamation*, The Third International Symposium, Apr. 24 - 27, San Diego, CA, 1995.

Rifai, H. S., Modeling of Ground Water Remediation Systems, 1995 SIAM Conference on Mathematical and Computational Issues in the Geosciences, Feb. 8 - 10, San Antonio, Texas, 1995.

Rifai, H. S., and J. Blackburn, Sustainable Development and the Two Llagunas, Water for Texas, Jan. 26 - 27, Austin, Texas, 1995.

Rifai, H. S., The Role of Universities in Data Acquisition and Sharing: The Two Llagunas Project, Texas GIS Forum, Nov. 30 - Dec. 1, Austin, Texas, 1994.

Rifai, H. S., Decision Support Systems in the Public Domain: Issues and Considerations, EPA Conference on Decision Support Systems, June 28 - 29, Seattle, Washington, 1994.

Rifai, H. S., and P. B. Bedient, Decision Support System for Evaluating Remediation Performance with Interactive Pump-and-Treat Simulator, EPA Annual Seminar, June 1 - 3, Ada, OK, 1994.

Rifai, H. S., A Decision Support System for Pump-and-Treat Remediation, 1994 EPA NARPM Conference, May 24 -26, Kansas City, Missouri, 1994.

Rifai, H. S., Geographical Information System and Decision Support System Applications in Groundwater, Seminar at Rice University, September 21, Houston, TX, 1993.

Rifai, H. S., Characterization of Non-Point Sources of Pollution in Galveston Bay, Woodward-Clyde Seminar Series, May 20, Houston, TX, 1992.

Rifai, H. S., Evolution of Geographical Information Systems for Site Management, Waste Management's Fall Technical Conference, September, Chicago, IL, 1991.

Rifai, H. S., and P. B. Bedient, GIS for Wellhead Protection, Association of Engineering Geologists 36th Annual Meeting, October 9-15, San Antonio, TX, 1993.

Rifai, H. S., and P. B. Bedient, Information Systems for Ground Water Protection, API Health and Environmental Meeting, Oct. 29, New Orleans, LA, 1991.

Rifai, H. S., Hydrogeologic Considerations for Site Design, EPA Seminar on Bioremediation, Aug. 1-2, Palm Beach, FL, 1990.

### **Research Presentations**

Rifai, H. S., 2007, Environmental and Infrastructure Impacts along the Gulf Coast in Texas, SSPEED Conference May 8-10, Rice University, Houston, Texas, 2007.

Desai, A. M., H. S. Rifai, and R. Stein, Bacteria Characterization in the Houston Metropolitan Area, TAEP Environmental Challenges and Innovations Conference: Gulf Coast 2007, Feb 15, Houston, Texas, 2007.

Villareal, G. C., H. S. Rifai, and R. Stein, Effectiveness of Dry and Wet Basins for Bacteria Control in Runoff, TAEP Environmental Challenges and Innovations Conference: Gulf Coast 2007, Feb 15, Houston, Texas, 2007.

Rifai, H. S., Characterizing E. Coli Loads into Houston Bayous, 8<sup>th</sup> Biennial State of the Bay Symposium, January 23-25, Galveston, Texas, 2007.

Correa, O., and H. S. Rifai, M. P. Suarez, and L. Koenig, Atmospheric Concentrations and Deposition of Polychlorinated Dibenzo-p-Dioxins (PCDDs) and Dibenzofurans (PCDFs) in Houston, TX, TCEQ-NUATRC (Mickeyl Leland National Urban Air Toxics Research Center) Air Toxics Workshop, October 17-18, 2005, Houston, TX (Poster Presentation).

Suarez, M. P., Rittaler, T., H. S. Rifai, and S. Hausman, Natural Attenuation of Chlorinated Solvents, 10<sup>th</sup> International Petroleum Environmental Conference (IPEC), Nov 11-14, Houston, TX, 2003.

Ling, M., H. S. Rifai, J. Aziz, C. J. Newell, J. Gonzales, J. Santillan, Decision Support Software for Designing Groundwater Monitoring Plans, 10<sup>th</sup> International Petroleum Environmental Conference (IPEC), Nov 11-14, Houston, TX, 2003.

Bagga, A., H. S. Rifai, and W. Rixey, Oxygen Release Characteristics of ORC, 10<sup>th</sup> International Petroleum Environmental Conference (IPEC), Nov 11-14, Houston, TX, 2003.

Petersen, T., M. P. Suarez, H. S. Rifai, P. Jensen, Y-C. Su, and R. Stein, Modeling and Allocation Development for an Urban Indicator Bacteria TMDL, AWRA Annual Conference, Nov. 2-5, San Diego, CA, 2003.

Suarez, M., H. S. Rifai, R. Palachek, K. Dean, P. Jensen, M. Bloom, and L. Koenig, TMDL for Dioxin in the Houston Ship Channel, SETAC Local Chapter Conference, April 25, Houston, Texas, 2003.

Bagga, A. and H. S. Rifai, Aerobic Bioremediation of MTBE – In-Situ Remediation Technology, 2003 NGWA Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration, Aug. 19-22, Costa Mesa, CA, National Ground Water Association, Westerville, OH, 2003 (Poster Presentation).

Bagga, A., and H. S. Rifai, In-Situ Aerobic Bioremediation – MTBE Remediation Strategy, 7th International In Situ and On-Site Bioremediation, June 2-5, Orlando, Florida, 2003.

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### **Professional Engineering Registration**

Professional Engineer, State of Texas, Registration No: 71207 (since 1991).

The Department of Civil & Environmental Engineering offers majors, minors and concentrations for a wide range of undergraduate students, as well as master's and PhD programs at multiple locations. Undergraduate Programs. Civil Engineering (BS). Clarkson University Assistant Professor of Civil and Environmental Engineering Behzad Behnia has been awarded a National Science Foundation grant for more than \$150,000. Read More. Thomas Holsen, Professor of Civil and Environmental Engineering, and Selma Mededovic, Associate Professor of Chemical and Biomolecular Engineering at Clarkson University's Wallace H. Coulter School of Engineering, have received a Small Business Innovation Research grant from the EPA. Read More. Civil and Environmental Engineering Professor Hanadi Rifai has been named the Environmental Professional of the Year by the Texas Association of Environmental Professionals (TAEP). Engineering, Camp-Style. Posted on June 14, 2013. Research grant and contract expenditures by University of Houston Cullen College of Engineering faculty totaled more than \$21.8 million in fiscal year 2009, the largest ever on record. Up some 50 percent from the previous fiscal year's total, primarily the federal government—the National Institutes of Health, the National Science Foundation and the U.S. Department of Energy—supported the research. NSF Grant to Fund Programs Boosting Interest, Pursuit of STEM Fields. Posted on August 28, 2009. Environmental engineering is concerned with the study of clean technologies that have no or as little impact on the environment as possible. An environmental engineer is involved in research and development of alternative energy sources, water reclamation, waste treatment and recycling. Environmental engineering also focuses on protecting public health, thus contributing to a sustainable development. Sub-disciplines of environmental engineering include: geotechnical engineering, structural engineering, transportation engineering. ENVS offers graduate work leading to Ph.D. degree in Soil, Water and Environmental Science at University of Arizona United States. Ph.D. Geospatial Science and Engineering - Geography Specialization.