

## **JEJAL REDDY BATHI, Ph.D., P.E.**

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### **RESEARCH INTERESTS**

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- Develop and advance science-based environmental models and decision support tools to simulate the impacts of land use, climate, and human influences and their interactions on hydrology and ecological response of the watershed.

### **COMPUTATIONAL SKILLS**

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Advanced experiences with hydrologic, hydraulic and water quality models (EPA BASINS, HSPF, WinSLAMM, S WMM, PRMS, HEC-HMS, HEC-RAS, EFDC, WASP7, PLOAD, BATHTUB).  
Operational experience with Arcview GIS and MapWindow. Some experience of programming with Fortran, C++, MATLAB, R statistics package for water resources management.

### **EDUCATION AND CERTIFICATIONS**

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**Ph.D., Civil Engineering, December 2008**

The University of Alabama, Tuscaloosa, Alabama

**M.S., Environmental Engineering, December 2007**

The University of Alabama, Tuscaloosa, Alabama

**M.S., Environmental Engineering, January 2005**

National University of Singapore, Singapore

**B.S., Chemical Technology, April 2000**

Osmania University, Hyderabad, India

**Professional Engineer (PE), AL, May 2012 (License No: 32720)**

National Trade Certificate (NTC-2) in Chemical Process Technology, November 2002, Institute of Technical Education, Singapore

### **ACADEMIC EXPERIENCE**

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**Research Scientist, Civil and Environmental Engineering, May 2014 – June 2015**

Jackson State University, MS

**Adjunct Faculty, Civil and Environmental Engineering, January 2013 – May 2015**

Jackson State University, MS

**Post-Doctoral Researcher, Civil Engineering, May 2013 – June 2014**

University of Alabama, Tuscaloosa, AL

**Research & Teaching Assistant, Civil Engineering, January 2006 – November 2008**

University of Alabama, Tuscaloosa, AL

## **INDUSTRIAL EXPERIENCE**

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### **Project Manager, Global Systems International, LLC, Chattanooga, TN, October 2009 – Present**

- Hydrodynamic modeling of Village Creek watershed, Alabama
- Hydrodynamic modeling of Medina River, Texas (Headwater section of San Antonio River)
- Pollutant loading and in lake pollutant fate modeling of Village Creek watershed, Texas
- Hydrodynamic modeling of Big Bear Lake, California
- Three dimensional flow and pollutant transport fluid dynamic modeling of Black Warrior River, Alabama

### **Senior Staff Engineer, Geosyntec, Inc, Santa Barbara, CA, November 2008 – August 2009**

- Hydrodynamic modeling of surface water quality treatment control

### **Process Engineer, DuPont Singapore Private Ltd, Singapore, May 2001 – August 2005**

## **REPRESENTATIVE PROJECT FUNDING IN LEAD ROLE**

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1. Valley Creek Watershed Master Planning, City of Birmingham, AL (Oct 2016 – Sep 2018): \$221,000.00
2. Village Creek Master Planning, City of Birmingham, AL (2013 – 2016): \$182,840.00
3. Birmingham Water Works Board, AL (2012 – 2014): \$113,475.00
4. Investigating Watershed Water Quality Benefits under New Site Design Stormwater Standards, submitted to United States Geological Survey (USGS), 104b Grant: \$75,001.92 (Not Funded)
5. Review Site Post-development Stormwater Requirements, Submitted proposal on behalf City of Birmingham and secured funding in 2014: \$42,000.00
6. Medina River Holistic Watershed Master Planning, San Antonio River Authority, TX (2011 – 2014): \$228,200.00
7. MS4 NPDES Permit and Stormwater Management Program (SWMP) Development, City of Birmingham, AL (2010 – 2013): \$255,000.00
8. Big Bear Lake Watershed TMDL Modeling, San Bernardino County, CA (2012): \$26,000
9. Ecosystem Restoration Study, Settingdown Creek, Forsyth County, GA (2010): \$23,000

## **REPRESENTATIVE RESEARCH AND ENVIRONMENTAL PROJECT EXPERIENCE**

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- 1). **Research Scientist, Impacts of Climate Stressors on Environment and Public Health (Funding Agency: Through Environmental Institute at Jackson State University, National Institute of Health (NIH); PI: Dr. Himangshu Das)**
  - Reviewed Federal Emergency Management Agency (FEMA) flood models for rain depth versus flood response for coastal Mississippi counties

- Developed a statistical model to explore the risks and sensitivities of coastal Mississippi's critical infrastructure, environment and public health due to flooding under current and future climate change scenarios.
- Developed project technical report for a NIH and published a peer reviewed journal article

**2). Post-Doc, Enhanced Stormwater Treatment at Scrap Metal Facilities (Funding Agency: Institute of Scrap Recycling Industries, Inc. ISRI; PI: Dr. Robert Pitt).**

- Lead research efforts of a research study unit of multi-institutional and multi study units project to characterize scrap metal industrial runoff pollution and evaluate performance of effluent treatment units for controlling sediments and heavy metals.
- Assisted with development of a detail source pollution simulation model (WinSLAMM) for the research site
- Mentored doctoral student with dissertation research (Student Name: Dr. Vijay Eppakayala, Major Professor: Dr. Robert Pitt).
- Developed three manuscripts that are waiting for funding agency approval for submission to journals

**3). Dissertation, Associations of Polycyclic Aromatic Hydrocarbons (PAHs) with Urban Creek Sediments, (Funding Support: National Science Foundation (NSF); Research Advisor: Dr. Robert Pitt) (2005 – 2008).**

- Developed a laboratory technique that coupled thermal desorption to Gas Chromatography/Mass Spectrophotometry for rapid analysis of semi-volatile toxicants.
- Studied influence of pollution source area land uses on partitioning fates of PAHs.
- Developed pollutant fate model based on fugacity concept to verify field observed partitioning fates of PAHs in the environment and examined possible impact of selected environmental factors on pollutant partitioning.
- Results were published in peer-reviewed journals and in proceedings of national and international conferences.

**4). Lake Arlington Master Plan Development, Arlington, TX (Funding Support: City of Arlington) (2010 - 2011) (Lead: Jejal Bathi)**

- Developed Geographical Interface System (GIS) enabled PLOAD model (a pollutant loading model) to simulate watershed hydrology and non-point source pollution. Land use GIS data, watershed boundary data along with Digital Elevation Model (DEM) data was processed to establish the watershed model to simulate nutrients, sediments and E.Coli pollution in the watershed.
- Developed a detail BATHTUB – an empirical model for lake and reservoir eutrophication- to investigate watershed management strategies.

**6). Medina River Holistic Watershed Master Planning (Funding Source: San Antonio River Authority, San Antonio, TX) 2011 – 2015) (Lead: Jejal Bathi)**

- Developed calibrated hydrodynamic surface runoff and receiving water hydrology-water quality models (suite of models together HSPF, SARA LRT, CEV and Enhanced BMP Tool application) to simulate 1,100 square miles, including a reservoir, for five continuous years at 5 minute intervals to investigate watershed water balance, nutrients and bacterial fate and transport.

**7). Water Pollution Sources and Transport Modeling (Funding Support: City of Birmingham, AL) (2014 - 2015) (Lead: Jejal Bathi)**

- Investigated impacts of urban development on local flooding, water infrastructure and receiving water quality. Research focused project tasks included continuous simulation of 100 square mile Village Creek watershed, spanning across several municipalities, using EPA Stormwater Management Model (SWMM). Pollutants of study focus were heavy metals, E. Coli and Sediments.
- Generated color coded thematic GIS maps illustrating pollution load rate potential for about 1 square-mile spatial area sub-basins which were helpful in targeting areas for management controls over the watershed.

**8). Black Warrior Pollutant Transport Modeling (Funding Support: Birmingham Water Works Board, AL) (2012 – 2014) (Lead: Jejal Bathi)**

- Three dimensional Environmental Fluid Dynamic Code (EFDC) based river simulation model was developed to investigate fate and transport of metals and sediments in about 2.5 mile stretch of Black Warrior River in Walker County, AL.
- Simulation results were used to negotiate with Alabama Department of Environmental Management (ADEM) to review point source pollution source discharge permit limits.

**9). Big Bear Lake Watershed TMDL Modeling (Funding Source: City of San Bernardino and San Bernardino County, CA) (2012) (Lead: Jejal Bathi)**

- Updated hydrodynamic watershed hydrology and water quality models to assess Total Maximum Daily Load (TMDL) compliance.
- Surface watershed loading Hydrology Simulation Program – Fortran (HSPF) model was coupled to receiving water pollutant fate and transport Water Quality Analysis Simulation Program (WASP) model for the watershed simulation.
- The time varying processes of advection, dispersion, point and diffuse mass loading and boundary exchange are represented in the WASP model and it was linked to hydrodynamic and sediment transport models that provided flows, depths velocities, temperature, salinity and sediment fluxes of the Big Bear Lake.

## **TEACHING ASSIGNMENTS**

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**1). Adjunct Faculty, Civil and Chemical Engineering, University of Tennessee at Chattanooga (January 2017 – Present)**

- Develop and teach Civil Engineering courses for students majoring in Environmental Engineering

**2). Adjunct Faculty, Civil and Environmental Engineering, Jackson State University (January 2013 – May 2015)**

- Developed and taught *Water Resources Engineering* class, a three credit hour course for juniors in spring semesters of 2013, 2014 and 2015.
- Average IDEA Student Instructional Research Survey (SIRS) evaluation score is 4.0
- Mentored senior civil engineering students (Major in Environmental Engineering) in their final engineering design projects

**3). Teaching Assistant, Civil, Environmental and Construction Engineering, The University of Alabama, (January 2006 – November 2008)**

Assisted with and taught environmental and water resources engineering courses at undergraduate and graduate level. The teaching assignments include classroom lectures during the absence of professor, development of laboratory demonstrations and experiments that illustrate core engineering concepts introduced in the classroom.

Teaching assignments were relevant to the following Courses:

- Fate and Transport of Contaminants (Air and Aqueous Medium)
- Water Resources Engineering
- Experimental Design and Field Sampling
- International Urban Water Systems

**4). Engineering Math Advancement Program (E-MAP), Environmental Institute, The University of Alabama; (Summers of 2006, 2007 and 2008)**

Taught Engineering Mathematics; Taught an Environmental Engineering Laboratory; Organized and led several educational field trip for freshmen students focusing on the environmental engineering science and aspects.

## **AWARDS AND RECOGNITIONS**

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- Marquis' Who's Who in America (2015 Edition)
- Alabama EPSCoR Graduate Research Scholar Program (GRSP) funding for 2007 and 2008
- American Water Works Association Alabama/Mississippi Graduate Scholarship Award (2007 - 2008)
- Silver Prize, Alabama Graduate Scholar Program, National Science Foundation's National EPSCoR Meeting, Hawaii, 2007
- State of Alabama: Recognition of Outstanding Work in Developing Cutting-Edge Technology and Research Performed on Behalf of the State of Alabama, 2007. Certifying officials: Senator Steve French and State Representative Richard J. Lindsey and Lt. Governor, Jim Folsom

## PROFESSIONAL AFFILIATIONS AND ACTIVITIES

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- Reviewer, U.S. Environmental Protection Agency (EPA) Science to Achieve Results ([STAR](#)) Fellowship Program, 2015
- Member, Urban Watershed Management Committee, Environmental and Water Resources Institute of the American Society of Civil Engineers, 2009
- Member, Publications Committee, Water Environment Federation, 2009
- Member, Students and Young Professional Committee, Water Environment Federation, 2007 – 2015
- Founding Member, Secretary/Treasurer of Black Warrior Environmental Association (BWEA), Student chapter of Alabama Water Environmental Federation and WEF, 2007 – 2008
- Chi Epsilon Honor Society, Inducted in 2007
- Reviewer, Water Environmental Research

## PUBLICATIONS

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### Peer-Reviewed Journal Articles

1. Pitt, R. Pitt., S. E. Clark, Y. Cai, M. Renee and Jejal, Bathi. Southeastern United States Observations of Stormwater Pollutant Strengths by Particle Size. *Journal of Water Management Modeling*, 2017, DOI: 10.14796/JWMM.C418.
2. **Bathi, J.R.**, and H.S. Das. Vulnerability of Coastal Communities from Storm Surge and Flood Disasters. *Int. J. Environ. Res. Public Health*, 2016, 13, 239.
3. **Bathi, J. R.**, R. E. Pitt, and S. E. Clark. Effects of Sediment Characteristics and Location on Polycyclic Aromatic Hydrocarbon (PAH) Associations. *International Journal of Environmental Pollution and Solutions*, 2013, 1.3 (2013): 110-130.
4. **Bathi, J. R.**, R.E. Pitt, and S.E. Clark. Polycyclic aromatic hydrocarbons in urban stream sediments. *Advances in Civil Engineering*, 2012.

### Book Chapters and Research Reports

1. Gadhamshetty, V.; Shrestha, N.; Chilkoor, G.; **Bathi, J.R.** Emerging Environmental Impacts of Unconventional Oil Development in the Bakken Formation in the Williston Basin of Western North Dakota. In *Hydraulic Fracturing: Environmental Issues*; Drogos, D. L., Ed.; ACS Symposium Series 1216; American Chemical Society: Washington, DC, 2015; Chapter 7.
2. Pitt, R., K. Goodson, O. Ogburn, V. Eppakayala, **J. Bathi**, B. Wilson, S. Subramaniam, and S. Clark. *Identification and Treatment of Emerging Contaminants in Wet Weather Flows*. EPA Contract: EP-C-07-014. Office of Research, EPA, 2013.

### Conference Proceedings

1. **Bathi, J. R.**, R. Samual. "Introduction to Changing Site Design Standards for Stormwater Management." Annual Mississippi Water Resources Conference, Jackson, MS, April 2-3, 2013.

2. **Bathi, J. R.**, R. Pitt, S. E. Clark. "Associations of PAHs with Size Fractionated Sediment Particles." World Environmental & Water Resources Congress 2009, American Society of Civil Engineers (ASCE) - EWRI. Kansas City, MO. May 17 – 21, 2009.
3. **Bathi, J. R.**, R. Pitt, R. Findlay, S. E. Clark and S. Mirov. 2008. Distribution of Polycyclic Aromatic Hydrocarbons among Sediment Size Fractions Determined by Thermal Desorption Gas Chromatography Mass Spectrometry. WEFTEC'08, Water Environmental Federation, Chicago, IL. October 18-22, 2008.
4. **Bathi, J. R.**, R. Pitt, R. Findlay, S. E. Clark. "Analyses of PAHs in Urban Stormwater Particulates." 11th International Conference on Urban Drainage, 11ICUD. Edinburgh, Scotland, UK, August and September 2008.
5. Clark, S. E., C. Y. S. Siu, C. D. Roenning, D. P. Treese, R. Pitt, and **J. R. Bathi**,. "Automatic Sampler Efficiency for Stormwater Solids". Presented at the 2007 Pennsylvania Stormwater Management Symposium. Villanova, October 17-18, 2007.
6. **Bathi, J. R.**, and R. Pitt. "Fates of Polycyclic Aromatic Hydrocarbons (PAHs) Affect Treatability." World Environmental & Water Resources Congress 2007. ASCE - EWRI. Tampa, FL. May 15 – 19, 2007.
7. **Bathi, J. R.**, R. Pitt, and R. Findlay. "Standardization of Thermal Desorption GC/MS Analysis for Polycyclic Aromatic Hydrocarbons and Comparison of Recoveries for Two Different Sample Matrices." Annual Mississippi Water Resources Conference, Jackson, MS, April 2007.
8. Peters, R. W., P. Sharma, and **J. R. Bathi**. "Benchmarking the Integration of Sustainability into Engineering Curricula at US Institutions of Higher Education" AIChE Annual Meeting San Francisco, CA, 2006.

#### Conference Presentations and Posters

1. Eppakayala, V.J., **Bathi, J. R.**, R. Pitt, S. E. Clark. "Stormwater Treatment at an Industrial Site using a Dry Infiltration Pond with Pre-Treatment". International Low Impact Development Conference 2015, Houston, TX, January 19 – 21, 2015.
2. Eppakayala, V.J., **Bathi, J. R.**, R. Pitt, S. E. Clark. "Stormwater Performance Monitoring of a Hydrodynamic Device and a Infiltrating Dry Pond at an Industrial Site". 2014 Alabama Water Resources Conference and Alabama Section of AWRA Symposium, Orange Beach, AL, September 3 – 5, 2014.
3. **Bathi, J.R.**, Ruggs., B. "Site Stormwater Standards and Supporting Modeling Tools". 25<sup>th</sup> Annual Nonpoint Source Conference, Alabama Department of Environmental Management, Montgomery, AL, January 22, 2014.
4. Revell, E., **Bathi, J.R.**, Ruggs., B. "A Case Study of an Integrated Approach for City Stormwater Management". New Water Quality Regulations – Change is in the Air!, SESWA 2011 Annual Conference, Asheville, NC, October 3 – 5, 2011.
5. **Bathi, J. R.** (Presenter), R. Pitt, S. E. Clark. "Associations of PAHs with Size Fractionated Sediment Particles." World Environmental & Water Resources Congress 2009, ASCE - EWRI. Kansas City, MO. May 17 – 21, 2009.
6. **Bathi, J. R.**(Presenter), R. Pitt, R. Findlay, S. E. Clark and S. Mirov. 2008. Distribution of Polycyclic Aromatic Hydrocarbons among Sediment Size Fractions Determined by

- Thermal Desorption Gas Chromatography Mass Spectrometry. WEFTEC'08, Water Environmental Federation, Chicago, IL. October 18-22, 2008
7. **Bathi, J. R.**(Presenter), R. Pitt, R. Findlay, S. E. Clark. "Analyses of PAHs in Urban Stormwater Particulates." 11th International Conference on Urban Drainage, 11ICUD. Edinburgh, Scotland, UK, August and September 2008.
  8. **Bathi, J. R.**(Presenter), R. Pitt. "Thermal Desorption Analytical Technique for PAHs Analyses". ALEPSCoR Annual Conference and Stakeholder Symposium, Montgomery, AL, July 2008.
  9. **Bathi, J. R.**(Presenter), R. Pitt, S. Mirov. "Understanding the Fates of PAHs using Thermal Desorption as an Analytical Tool." National NSF EPSCoR Meeting, Waikola, Hawaii, November, 2007.
  10. Pitt, R., **J. R. Bathi**, C. Greer, K. Boykin, and R. Rogers, "Multi-Disciplinary Collaborative Sustainable Environmental Land-Related Research at the University of Alabama". Presented at the 2007 Gulf Coast Forum: "Gulf States Alliance: Network Science and Recovery", Biloxi, MS, August, 2007.
  11. **Bathi, J. R.**(Presenter), and R. Pitt. "Fates of Polycyclic Aromatic Hydrocarbons (PAHs) Affect Treatability." World Environmental & Water Resources Congress 2007. ASCE - EWRI. Tampa, FL. May 15 – 19, 2007.
  12. **Bathi, J. R.**(Presenter), R. Pitt, and R. Findlay. "Standardization of Thermal Desorption GC/MS Analysis for Polycyclic Aromatic Hydrocarbons and Comparison of Recoveries for Two Different Sample Matrices." Annual Mississippi Water Resources Conference, Jackson, MS, April 2007.
  13. **Bathi, J. R.** (Presenter), and R. Pitt. "Fate of Emerging Contaminants in Stormwater: A case Study of Polycyclic Aromatic Hydrocarbons (PAHs)." Alabama's Water Environment Association 2007 Technical Conference. Orange Beach, AL, April 15 – 18, 2007.
  14. **Bathi, J. R.** (Presenter), Pitt. R. "Sample Preparation for GC/MS Analysis to Study the Partition of Organic Contaminants in Water". Alabama EPSCoR Annual Conference, Tuskegee, AL, February 2006.