Bhavna Arora

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Research Interests: Understanding the influence of heterogeneities in the subsurface, reactive transport modeling, hot spots and hot moments analysis, and scaling of biogeochemical parameters/ properties.

Education

2006 - 2012	Ph.D., Water Management & Hydrologic Sciences Texas A&M University, College Station, TX
2001 - 2006	M. Tech., Water Resources Development & Management B.Tech. (Hons), Agricultural & Food Engineering Minor, Mathematics & Computing Indian Institute of Technology (IIT), Kharagpur, India

Professional Positions

2012 - Present	Postdoctoral Fellow, Lawrence Berkeley National Laboratory
2006 - 2012	Research & Teaching Assistant, Texas A&M University
2004 - 2004	Water Quality Intern, Jumbo International
2003 - 2003	Software Development Intern, Indian Agricultural Research Institute

Honors and Awards

2014	AAAS/Science Program for Excellence in Science Membership Award, American Association for the Advancement of Science
2012	Biological & Agricultural Engineering Graduate Scholarship, Texas A&M University
2011	Bill and Rita Stout International Graduate Student Achievement Award, Texas A&M University
2010	Outstanding Student Paper Award, AGU Fall Meeting
2010	Graduate Student Research and Presentation Grant, Texas A&M University
2010-2011	Regents' Scholarship, Texas A&M University
2009-2010	TWRI Mills Scholarship, Texas Water Resources Institute
2009	Graduate Student Council Travel Grant, Texas A&M University
2006	Institute Silver Medalist, IIT Kharagpur
2006	A. A. Hakim Memorial Endowment Prize, IIT Kharagpur
2003	Vinod Gupta Leadership award, IIT Kharagpur

Publications

- **Arora, B.**, D. Dwivedi, S. S. Hubbard, C. I. Steefel, and K. H. Williams (2015), Identifying geochemical hot moments and their controls on a contaminated river floodplain system using wavelet and entropy approaches, *Submitted, Environmental Modelling & Software*.
- **Arora, B.**, B. P. Mohanty, and J. T. McGuire (2015), An integrated Markov chain Monte Carlo algorithm for upscaling hydrological and geochemical parameters from column to field scale, *Science of the Total Environment, 512-513*, 428-443, doi:10.1016/j.scitotenv.2015.01.048.
- Wainwright, H. M., S. Molins, J. A. Davis, **B. Arora**, B. Faybishenko, H. Krishnan, S. S. Hubbard, G. Flach, M. Denham, C. Eddy-Dilek, D. Moulton, K. Lipnikov, C. W. Gable, T. A. Miller, and M. Freshley (2015), Using ASCEM modeling and visualization to inform stakeholders of contaminant plume evolution and remediation efficacy at F-Basin Savannah River, SC, *15156*, *Proceedings of WM 2015 Conference*.
- Mayer, K. U., P. Alt-Epping, D. Jacques, **B. Arora,** and C. I. Steefel (2014), Benchmark problems for reactive transport modeling of the generation and attenuation of acid rock drainage, *In review, Computational Geosciences*.
- **Arora, B.**, S. S. Sengör, N. F. Spycher, and C. I. Steefel (2014), A reactive transport benchmark on heavy metal cycling in lake sediments, *Computational Geosciences*, DOI: 10.1007/s10596-014-9445-8.
- Steefel, C. I., C. A. J. Appelo, **B. Arora**, D. Jacques, T. Kalbacher, O. Kolditz, V. Lagneau, P. C. Lichtner, K. U. Mayer, J. C. L. Meussen, S. Molins, D. Moulton, H. Shao, J. Simunek, N. Spycher, S. B. Yabusaki, and G. T. Yeh (2014), Reactive transport codes for subsurface environmental simulation, *Computational Geosciences,* DOI:10.1007/s10596-014-9443-x.
- **Arora, B.**, B. P. Mohanty, J. T. McGuire, and I. M. Cozzarelli (2013), Temporal dynamics of biogeochemical processes at the Norman Landfill site, *Water Resources Research*, *49*, 1-18, doi: 10.1002/wrcr.20484.
- **Arora, B.**, B. P. Mohanty, and J. T. McGuire (2012), Uncertainty in dual permeability model parameters for structured soils, *Water Resources Research*, *48*, W01524, doi: 10.1029/2011WR010500.
- **Arora, B.**, B. P. Mohanty, and J. T. McGuire (2011), Inverse estimation of parameters for multidomain flow models in soil columns with different macropore densities, *Water Resources Research*, 47, W04512, doi: 10.1029/2010WR009451. **(Note:** *This publication was a featured article in EOS, Transactions of the American Geophysical Union*)

Recent Conference Abstracts

- **Arora, B.**, D. Dwivedi, S. S. Hubbard, C. I. Steefel, and K. H. Williams (2015), Towards improved characterization of geochemical hot moments: A combined wavelet-entropy approach, SIAM Conference on Mathematical and Computational Issues in the Geosciences, Stanford, June 29 – July 2, 2015. *(submitted abstract)*
- Wainwright, H. M., S. Molins, H. Krishnan, **B. Arora**, J. A. Davis, A. Romosan, B. Faybishenko, S. S. Hubbard, G. Flach, M. Denham, C. Eddy-Dilek, D. Moulton, K.

Lipnikov, T. A. Miller, C. W. Gable, and M. Freshley (2015), Using ASCEM modeling and visualization to inform stakeholders of contaminant plume evolution and remediation efficacy at F-Basin Savannah River, *MODFLOW and More Conference*, Phoenix, May 31- Jun. 3, 2015. *(submitted abstract)*

- **Arora, B.**, N. F. Spycher, S. Molins, and C. I. Steefel (2014), Modeling the biogeochemical response of a flood plain aquifer impacted by seasonal temperature and water table variations, AGU Fall Meeting, San Francisco, Dec. 15-19, 2014.
- Conrad, M., **B. Arora**, K. H. Williams, M. Bill, N. F. Spycher, C. I. Steefel, T. T. Tokunaga and S. S. Hubbard (2014), Using concentrations and isotopic compositions of CO_2 to distinguish microbial production of CO_2 in unsaturated zone sediments in hydrogeochemical models, AGU Fall Meeting, San Francisco, Dec. 15-19, 2014.
- Druhan, J., Y. Cheng, **B. Arora**, and C. I. Steefel (2014), Carbon isotope partitioning in natural and labeled systems: A reactive transport modeling benchmarking study, Subsurface Environmental Simulation Benchmarking Workshop IV, Château de Cadarache, Oct. 6-8, 2014.
- Yabusaki, S., Y. Fang, **B. Arora**, N. Spycher, and H. Wainwright (2014), Benchmark problem for field-scale variably-saturated flow and biogeochemical reactive transport, Subsurface Environmental Simulation Benchmarking Workshop IV, Château de Cadarache, Oct. 6-8, 2014.
- **Arora, B.**, K. U. Mayer, C. I. Steefel, N. F. Spycher, S. Sengor, D. Jacques, and P. Alt-Epping (2014), Reactive transport benchmarks on heavy metal cycling, Goldschmidt Conference, Sacramento, Jun. 8-13, 2014.

Service and Synergistic Activities

Peer Reviewer for the Following Journals:

Reviewed manuscripts for *Computational Geosciences*, *Environmental Modelling and Software*, *Science of the Total Environment*, *Transactions of the ASABE*, *Water, Air, & Soil Pollution*, and *Water Resources Research*.

Professional Affiliations:

American Association for the Advancement of Science
Geological Society of America
American Geophysical Union
Soil Science Society of America
Alpha Epsilon
Phi Kappa Phi

Other Contributions:

- Session Chair, Characterizing Spatial and Temporal Variability of Hydrological and Biogeochemical Processes across Scales, AGU Fall Meeting, Dec. 15-19, 2014. Co-

conveners: Haruko Wainwright (LBNL) and Susan Hubbard (LBNL).

- Breakout Session Coordinator, Upscaling constructs: approaches to identify, interrogate and model functional zones and associated biogeochemical reactive transport across the genome, plot, floodplain, watershed and basin scales, SFA 2.0 Retreat, Oct. 22-24, 2014.
- Community Outreach Volunteer, Lawrence Berkeley National Laboratory, 40th Annual Solano Avenue Stroll, Sept. 14, 2014.
- Session Co-Chair, Soil organic matter dynamics in the Anthropocene, AGU Fall Meeting, Dec. 9-13, 2013. Co-conveners: Kate Lajtha (Oregon State University), Dipankar Dwivedi (LBNL), and William Riley (LBNL).
- Treasurer & Founding Member, Water Without Boundaries, student society of the Water program, 2007-2009
- Pre-conference Volunteer, Bi-National Water Congress held in Saltillo, Mexico, Nov. 2007