

ANDREW J. GUSWA

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ACADEMIC EMPLOYMENT

Director, Center for the Environment, Ecological Design, and Sustainability
Smith College, 2009 – present

Associate Professor, Picker Engineering Program
Smith College, 2007 – present

Assistant Professor, Picker Engineering Program
Smith College, 2001 - 2007

Post-Doctoral Teaching Fellow, Department of Civil and Environmental Engineering
Princeton University, 2000 – 2001

EDUCATION

Ph.D., Stanford University, 2000
Dept. of Civil and Env. Engineering, Environmental Fluid Mechanics and Hydrology

M.S., Stanford University, 1995
Dept. of Civil and Env. Engineering, Environmental Fluid Mechanics and Hydrology

B.S.E., Princeton University, 1994
Summa cum laude
Dept. of Civil Engineering and Operations Research, Environmental Engineering

AWARDS AND HONORS

New Century Scholar Workshop for Junior Faculty in Engineering
National Science Foundation, 7/02

Council on Science and Technology Post-Doctoral Teaching Fellowship
Princeton Environmental Institute Post-Doctoral Fellowship
Department of Civil and Environmental Engineering, Princeton University, 9/00-8/01

National Research Council Post-Doctoral Research Associateship
(Awarded in 2000, but declined)

Achievement Rewards for College Scientists Fellowship
Department of Civil and Environmental Engineering, Stanford University, 9/98-8/99

National Science Foundation Fellowship
Department of Civil and Environmental Engineering, Stanford University, 9/95-8/98

Departmental Fellowship
Department of Civil and Environmental Engineering, Stanford University, 9/94-6/95

Calvin Dodd MacCracken Senior Thesis / Project Award
School of Engineering, Princeton University, recognizing the senior thesis or project work that is most distinctive for its inventiveness and technical accomplishment, June 1994

Accepted into Phi Beta Kappa, Tau Beta Pi, and Sigma Xi honor societies
Princeton University, 1994

GRANT FUNDING (PI OR CO-PI)

Natural Capital Project, Senior Hydrology Advisor, 12/1/2011-11/30/2012, \$44,000.

Stephen Bechtel Fund, Center for the Environment, Ecological Design and Sustainability, 7/1/2011-6/30/2012, \$100,000.

S. D. Bechtel, Jr. Foundation, *Development of the MacLeish Field Station for Environmental Education*, project includes the design and construction of a 2300-square-foot environmental classroom, 9/10/10-9/9/13, amount kept confidential at the request of the granting agency.

Stephen Bechtel Fund, *Center for the Environment, Ecological Design and Sustainability*, 7/9/2010-7/8/2011, \$100,000.

US Geological Survey, Water Resources Annual Institute Program, *Impact of the hemlock woolly adelgid on the water cycle in New England: Differences in hydrologic fluxes between hemlock and deciduous forest stands*, dates, 5/1/10-12/31/10, \$5000.

Mellon Foundation Summer Stipend Grant, *The Role of Dry-Season Precipitation in the Cloud Forests of Monteverde, Costa Rica*, co-PI, 2005, \$8000.

PEER-REVIEWED PUBLICATIONS (undergraduate authors indicated by graduation year)

Guswa, Andrew J., in review. Canopy versus roots: Production and destruction of variability in soil moisture and hydrologic fluxes, submitted to *Vadose Zone Journal*.

Guswa, Andrew J. and C. M. Spence '11, 2011. Effect of throughfall variability on recharge: Application to hemlock and deciduous forests in western Massachusetts, *Ecohydrology*, doi: 10.1002/eco.281.

Shah, S. H. H., R. W. Vervoort, S. Suweis, **A. J. Guswa**, A. Rinaldo, A. E. A. T. M. van der Zee, 2011. Stochastic modeling of salt accumulation in the root zone due to capillary flux from brackish groundwater, *Water Resources Research*, 47, W09506, doi:10.1029/2010WR009790.

Jenerette, G. D., G. A. Barron-Gafford, **A. J. Guswa**, J. J. McDonnell, J. Villegas, 2011. Organization of complexity in water-limited ecohydrology, *Ecohydrology*, doi: 10.1002/eco.217.

Gerecht '10, K. E., M. B. Cardenas, **A. J. Guswa**, J. D. Nowinski, A. H. Sawyer, and T. E. Swanson, 2011. Dynamics of hyporheic flow and heat transport across a bed-to-bank continuum in a large regulated river, *Water Resources Research*, 47, W03524, doi: 10.1029/2010WR009794.

Guswa, Andrew J., 2010. Effect of plant-uptake strategy on the water-optimal root depth, *Water Resources Research*, 46, W09601, doi:10.1029/2010WR009122.

Rhodes, Amy L., **A. J. Guswa**, and S. E. Newell '04, 2010. Using stable isotopes to identify orographic precipitation events in Monteverde, Costa Rica. In: Bruijnzeel, L.A., Scatena, F.N., and Hamilton, L.S., (eds), *Tropical Montane Cloud Forests: Science for Conservation and Management*, Cambridge University Press, Cambridge, UK.

Rhodes, Amy L., **A. J. Guswa**, S. Dallas, E. M. Kim '02, S. Katchpole '02, A. Pufall, 2010. Human impacts on stream-water chemistry in a tropical montane cloud forest watershed, Monteverde, Costa Rica. In: Bruijnzeel, L.A., Scatena, F.N., and Hamilton, L.S., (eds),

Tropical Montane Cloud Forests: Science for Conservation and Management, Cambridge University Press, Cambridge, UK.

Guswa, Andrew J., 2008. The influence of climate on root depth: A carbon cost-benefit analysis, *Water Resources Research*, 44, W02427, doi:10.1029/2007WR006384.

Guswa, Andrew J., A. L. Rhodes, and S. E. Newell '04, 2007. Importance of orographic precipitation to the water resources of Monteverde, Costa Rica, *Advances in Water Resources*, 30, 2098-2112, doi:10.1016/j.advwatres.2006.07.008.

Puma, Michael J., I. Rodriguez-Iturbe, M. A. Celia, and **A. J. Guswa**, 2007. Implications of rainfall temporal resolution for soil-moisture and transpiration modeling, *Transport in Porous Media*, 68(1), 37-67.

Rhodes, Amy L., **A. J. Guswa**, and S. E. Newell '04, 2006. Seasonal variation in the stable isotopic composition of precipitation in the tropical montane forests of Monteverde, Costa Rica, *Water Resources Research*, 42, W11402, doi:10.1029/2005WR004535.

Guswa, Andrew J., 2005. Soil-moisture limits on plant uptake: An upscaled relationship for water-limited ecosystems, *Advances in Water Resources*, 28(6), 543-552.

Puma, M. J., M. A. Celia, I. Rodriguez-Iturbe, and **A. J. Guswa**, 2005. Functional relationship to describe temporal statistics of soil moisture averaged over different depths, *Advances in Water Resources*, 28(6), 553-566.

Guswa, Andrew J., M. A. Celia, and I. Rodriguez-Iturbe, 2004. Effect of vertical resolution on predictions of transpiration in water-limited ecosystems, *Advances in Water Resources*, 27(5), 467-480.

Celia, M.A. and **A.J. Guswa**, 2002. Hysteresis and Upscaling in Two-Phase Flow through Porous Media, *Proc. Joint Summer Research Conference on Fluid Flow and Transport in Porous Media: Mathematical and Numerical Treatment*, Chen and Ewing (Eds.), American Mathematical Society, 93-104.

Guswa, Andrew J., M. A. Celia, and I. Rodriguez-Iturbe, 2002. Models of soil-moisture dynamics in ecohydrology: A comparative study, *Water Resources Research*, 38(9).

Guswa, Andrew J., and D. L. Freyberg, 2002. On using the equivalent conductivity to describe solute spreading in geologic environments with low-permeability lenses, *Water Resources Research*, 38(8).

Bruant, Jr., R. G., **A. J. Guswa**, M. A. Celia, and C. A. Peters, 2002. Safe Storage of CO₂ in Deep Saline Aquifers, Feature article in *Environmental Science and Technology*, 36(11), 240A-245A.

Guswa, Andrew J., and D. L. Freyberg, 2000. Slow advection and diffusion through low permeability inclusions, *Journal of Contaminant Hydrology*, 46 (3-4), 205-232.

ABSTRACTS, CONFERENCE PROCEEDINGS, AND TECHNICAL REPORTS

Guswa, Andrew J., Creation and destruction of soil moisture variability by vegetation, Abstract H11E-1096 presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.

Guswa, Andrew J., E. Armstrong, M. Barresi, A. Leone, C. McCune, D. Riley, S. Sayre, E. Spelman, 2011. A Case for Integration: The Deepwater Horizon Oil Spill, Annual meeting of the Association of Environmental Sciences and Studies, University of Vermont, 23-26 June.

Guswa, Andrew J., 2011. Effect of vegetation on throughfall patterns and recharge: Application to hemlock and deciduous forests in western Massachusetts (invited), *Ecohydrology and Sustainability in Seasonally Dry Ecosystems, International Workshop*, Duke University, 13-14 June.

Guswa, Andrew J., E. Armstrong, A. Leone, S. Sayre, 2011. Fostering Integration: Faculty Learning Communities, 4th Annual Symposium on Engineering and Liberal Education, Union College, 3-4 June.

Spence '11, C. and **A. J. Guswa**, 2011. Biotic and abiotic factors affecting throughfall volume and spatial variability in a New England forest, *MA Water Resources Research Center, 8th Annual Conference*, University of Massachusetts, Amherst, MA, 7 April 2011.

Guswa, Andrew J., M. Mussehl '12, A. Pecht '12, and C. Spence '11, 2010. Spatial pulses of water inputs in deciduous and hemlock forest stands, *Eos Trans. AGU*, Fall Meeting Suppl., Abstract B24B-08.

Gerecht, '10 K. E., M. B. Cardenas, **A. J. Guswa**, A. H. Sawyer, T. E. Swanson, J. D. Nowinski, 2010. Hyporheic flow and heat transport in a large regulated river, *Eos Trans. AGU*, Fall Meeting Suppl., Abstract H21B-1049.

Guswa, Andrew J., 2010. The Simplest in Hypothesis and Richest in Phenomena: Vegetation Structure and Hydrologic Fluxes (invited), Latsis International Symposium on Ecohydrology, EPFL Lausanne, Switzerland, 17-20 October 2010.

Guswa, Andrew J., J. Bellemare, R. Bertone-Johnson, S. Froehlich, R. Newton, D. Renfrow, A. Rhodes, and P. Voss, 2010. Environmental Monitoring: the Ada and Archibald MacLeish Field Station, Smith College, Whately, MA, *MA Water Resources Research Center, 7th Annual Conference, Monitoring and Responding to Water Resources Challenges*, University of Massachusetts, Amherst, MA, 8 April 2010.

Gerecht '10, K. E., A. H. Sawyer, T. E. Swanson, J. D. Nowinski, **A. J. Guswa**, and M. B. Cardenas, 2010. Dam release impacts on stream-groundwater interactions, *MA Water Resources Research Center, 7th Annual Conference, Monitoring and Responding to Water Resources Challenges*, University of Massachusetts, Amherst, MA, 8 April 2010 [First place in student poster competition].

Spence '11, C. and **A. J. Guswa**, 2010. Exploiting temporal persistence for efficient throughfall measurement, *MA Water Resources Research Center, 7th Annual Conference, Monitoring and Responding to Water Resources Challenges*, University of Massachusetts, Amherst, MA, 8 April 2010.

Klein, J. D., J. J. Krupczak, I. Baker, J. S. Rossman, **A. J. Guswa**, 2010. Engineering and Liberal Education, 96th Annual Meeting of the Association of American Colleges and Universities: The Wit, the Will, and the Wallet, January 20-23.

Guswa, Andrew J., A. L. Rhodes, J. McNicholas '11, S. Mehter '11, and C. Spence '11, 2009. Ecohydrologic implications of differences in throughfall between hemlock and deciduous forest plots, West Whately, MA, *Eos Trans. AGU*, 90(52), Fall Meeting Suppl., Abstract H33D-908.

Rhodes, A. L., **A. J. Guswa**; J. McNicholas '11; S. Mehter '11; C. Spence '11, 2009. Effect of hemlock and deciduous forest canopy on chemistry of throughfall, West Whately, Massachusetts. *Eos Trans. AGU*, 90(52), Fall Meeting Supplement, Abstract H34E-01.

Guswa, Andrew J., 2009. Spatial variability of throughfall and implications for root architecture, Chapman Conference on Examining Ecohydrological Feedbacks of Landscape Change along Elevation Gradients in Semiarid Regions, 5-9 October 2009.

Guswa, Andrew J. and A. L. Rhodes, 2009. Out in the Field: A Natural Integration of Landscape, History, Engineering, and the Environment. 2009 Symposium on Engineering and Liberal Education: Educating Stewards of a Sustainable Future, Union College.

Rhodes, A. L., **A. J. Guswa**, A. Pufall, 2009. Fate and transport of road salt contamination through a calcareous fen: Kamposoa Bog, Stockbridge, MA, *GSA Abstracts with Programs*, Vol 41., No 3.

Guswa, Andrew J., 2008. Effect of plant-uptake representation on the water-optimal root depth, *Eos Trans. AGU*, 89(53), Fall Meeting Suppl., Abstract H13E-0967.

Rhodes, A. L., **A. J. Guswa**, 2008. Geochemical response of a calcareous fen to road salt contamination during snow melt and precipitation events: Kamposoa Bog, Stockbridge, MA, *Eos Trans. AGU*, 89(53), Fall Meeting Suppl., Abstract H33F-1084.

Guswa, Andrew J., and A. L. Rhodes, 2008. Meteorology of Monteverde, Costa Rica, 2007. Technical Report submitted to the Monteverde Institute, 29 pages.

Guswa, Andrew J., 2008. Response of root depth to climate: A hydrologist's view of the critical zone, Geological Society of America Annual Meeting, Abstracts with Programs, 40(6), 56-4.

Rhodes, A. L., **A. J. Guswa**, A. Pufall, 2008. Hydrogeochemistry of Kamposoa Bog, Final Report to the Massachusetts Environmental Trust, 15 June 2008, 75 pages.

Guswa, Andrew J., 2008. The effect of precipitation variability on root depth and the partitioning of hydrologic fluxes, *MA Water Resources Research Center, 5th Annual Conference, Integrating Water Resources Management*, Proceedings, University of Massachusetts, Amherst, MA, 8 April 2008.

Rhodes, A. L., **A. J. Guswa**, A. Pufall, 2008. Fate and transport of road salt during snowmelt through a calcareous fen: Kamposoa Bog, Stockbridge, Massachusetts, *MA Water Resources Research Center, 5th Annual Conference, Integrating Water Resources Management*, Proceedings, University of Massachusetts, Amherst, MA, 8 April 2008.

Alex Webster '08, **A. J. Guswa**, V. Hayssen, 2008. Effect of stand characteristics on throughfall in a New England forest, *MA Water Resources Research Center, 5th Annual Conference, Integrating Water Resources Management*, Proceedings, University of Massachusetts, Amherst, MA, 8 April [Honorable mention in student poster competition].

Rhodes, A. L., **A. J. Guswa**, and A. Pufall, 2007. Fate and transport of road salt during snowmelt through a calcareous fen: Kamposoa Bog, Stockbridge, Massachusetts, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract H21I-03.

Guswa, Andrew J., and A. L. Rhodes, 2007. Meteorology of Monteverde, Costa Rica, 2006. Technical Report submitted to the Monteverde Institute, 33 pages.

Guswa, Andrew J. and A. L. Rhodes, 2007. Ecohydrology and Water Resources of Monteverde, Costa Rica: Implications of a Changing Climate, *MA Water Resources Research Center, 4th Annual Conference, Sustainable Waters in a Changing World: Research to Practice*, Proceedings, University of Massachusetts, Amherst, MA, 9 April 2007.

June K. Yeung '07 and **A. J. Guswa**, 2007. Rainfall-runoff modeling for a small headwater catchment in Monteverde, Costa Rica, *MA Water Resources Research Center, 4th Annual Conference, Sustainable Waters in a Changing World: Research to Practice*, Poster, University of Massachusetts, Amherst, MA, 9 April.

Guswa, Andrew J., 2006. The influence of climate on root depth, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract B41E-0235.

Yeung, June K. '07, **A. J. Guswa**, A. L. Rhodes, 2006. Streamflow report for the Quebrada Cuecha in Monteverde, Costa Rica, June 2004 – April 2006. Technical report submitted to the Monteverde Institute.

Guswa, Andrew J., and A. L. Rhodes, 2006. Meteorology of Monteverde, Costa Rica, 2005. Technical Report submitted to the Monteverde Institute, 34 pages.

Guswa, Andrew J., and A. L. Rhodes, 2005. Importance of dry-season precipitation to the water resources of Monteverde, Costa Rica, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H54C-03.

- Rhodes, Amy L., **A. J. Guswa**, and S. E. Newell '04, 2005. Seasonal variation in the stable isotopic composition of precipitation in the tropical montane forests of Monteverde, Costa Rica, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H43E-0533.
- Puma, Michael A., I. Rodriguez-Iturbe, M. A. Celia, J. M. Nordbotten, and **A. J. Guswa**, 2005. Effects of spatial heterogeneity in rainfall and vegetation on the space-time scaling of soil-moisture and evapotranspiration, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract B33D-1056.
- Guswa, Andrew J.**, 2005. Implementation of "Structures and the Urban Environment" at Smith College: Doing Design, *Proceedings of the Summer Symposium on Teaching and Scholarship in the Grand Tradition of Modern Engineering*, Princeton University, NJ, August 7-10, 2005.
- Celia, M. A., I. Rodriguez-Iturbe, **A. J. Guswa**, J. M. Nordbotten, and M. J. Puma, 2005. Representation of soil moisture, evapotranspiration, and solute transport across different length and time scales, *Eos Trans. AGU*, 86(18), Joint Meeting, Abstract H42A-01.
- Guswa, Andrew J.**, 2005. Mountains in the mist: Characterization of hydrologic fluxes in Monteverde, Costa Rica. *Proceedings of the 3rd CNR-Princeton Workshop on New Frontiers in Hydrology*, Princeton, NJ, May 17-20, 2005.
- Johnson, Ilona R. '06, **A. J. Guswa**, and A. L. Rhodes, 2005. Meteorology of Monteverde, Costa Rica, November 2003 – November 2004. Technical Report submitted to the Monteverde Institute, 23 pages.
- Guswa, Andrew J.**, and A. L. Rhodes, 2004. Wet-season throughfall in primary and secondary tropical montane cloud forests, Monteverde, Costa Rica. *Eos Trans. AGU*, 85(47), Fall Meeting Suppl., Abstract H54C-08.
- Rhodes, Amy L., **A. J. Guswa**, and S. E. Newell '04, 2004. Using stable isotopes to trace orographic precipitation in a tropical montane cloud forest, Monteverde, Costa Rica. *Eos Trans. AGU*, 85(47), Fall Meeting Suppl., Abstract H54C-05.
- Guswa, Andrew J.**, 2004. Implementation of "Structures and the Urban Environment" at Smith College: Development of a Digital Image Database, *Proceedings of the Summer Symposium on Teaching and Scholarship in the Grand Tradition of Modern Engineering*, Princeton, NJ, August 8-13, 2004.
- Guswa, Andrew J.**, A. L. Rhodes, 2004. Unique Benefits of Involving Undergraduates in Tropical Montane Cloud Forest Research: A Case Study from Smith College, *Forests in the Mist: 2nd Intl. Symp. on Tropical Montane Cloud Forests*, July 27 – August 2, 2004.
- Rhodes, A. L., **A. J. Guswa**, S. Dallas, E. M. Kim '02, S. Katchpole '02, S. E. Newell '04, A. Pufall, 2004. Water quality of a tropical montane cloud forest watershed, Monteverde, Costa Rica, *Eos Trans. AGU*, 85 (17), Joint Assembly Suppl., Abstract H23B-13.
- Guswa, Andrew J.**, M. A. Celia, and I. Rodriguez-Iturbe, 2003. Effect of model resolution on predictions of vegetation health in water-limited ecosystems, *Eos Trans. AGU*, 84 (46), Fall Meeting Suppl., Abstract H42H-01.
- Guswa, Andrew J.**, and A. L. Rhodes, 2003. Successful undergraduate research: Creating win-win-win, *Eos Trans. AGU*, 84 (46), Fall Meeting, Abstract ED11B-0105.
- Puma, Michael J., M. A. Celia, I. Rodriguez-Iturbe, **A. J. Guswa**, 2003. Functional relationship to describe temporal statistics of soil moisture averaged over different depths, *Eos Trans. AGU*, 84(46), Fall Meeting Suppl., Abstract H42H-02.
- Guswa, Andrew J.**, 2003. Soil-moisture limits on plant water uptake: A multivalued upscaled relationship for water-limited ecosystems, *Proceedings of the 2nd CNR-Princeton Workshop on New Frontiers in Hydrology*, Capri, Italy, October 22-24, 2003.
- Guswa, Andrew J.**, I. Rodriguez-Iturbe, and M. A. Celia, 2002. Soil-moisture dynamics and plant uptake in water-limited ecosystems: Process representation and model scale, *Proceedings of the*

1st CNR-Princeton Workshop on New Frontiers in Hydrology, Princeton University, October 23-25, 2002.

Rodriguez-Iturbe, I., M. A. Celia, and **A. J. Guswa**, 2002. Climate, soil, and vegetation: A dynamical perspective of ecohydrology, invited plenary talk, 14th *International Conference on Computational Methods in Water Resources*, June 2002, Delft, Chapter 47 in *Computational Methods in Water Resources*, S. M. Hassanizadeh, R. J. Schotting, W. G. Gray, and G. F. Pinder, editors, Elsevier, pp. 1459-1470.

Guswa, Andrew J., Celia, M. A., and Rodriguez-Iturbe, I., 2001. Comparison of infiltration models for evaluating vegetation stress in water-controlled ecosystems, [Abstract], *Eos Trans. American Geophysical Union*, Vol 82, No 20.

Guswa, Andrew J., Bruant, Jr., R. G., and Celia, M. A., 2001. Hydraulic Controls on Carbon Dioxide Injection in Deep Saline Aquifers, [Abstract], *Eos Trans. American Geophysical Union*, Vol. 82, No. 20.

Guswa, Andrew J., and D. L. Freyberg, 2000. Evaluation of the Need for a Mass-Transfer Model to Describe Solute Tailing due to Low-Permeability Lenses, [Abstract], *Eos Trans. American Geophysical Union*, Vol. 81, No. 48, F435.

Guswa, Andrew J., 2000. *Modeling Solute Transport: Tailing Due to Low-Permeability Lenses*, Ph.D. dissertation, Stanford University.

Guswa, Andrew J., J. A. Cunningham, and D. L. Freyberg, 1999. A Two-Region Model to Account for Slow Advection through Low Permeability Lenses, [Abstract], *Eos Trans. American Geophysical Union*, Vol. 80, No. 46, p. F389.

Guswa, Andrew J., and D. L. Freyberg, 1998. Transport Effects of Diffusion and Slow Advection Through a Low Permeability Inclusion, [Abstract], *Eos Trans. American Geophysical Union*, Vol. 79, No. 45, p. F392.

Cunningham, J. A., **A. J. Guswa**, D. L. Freyberg, and P. V. Roberts, 1998. Use of temporal moment analysis to determine the importance of sorption kinetics for contaminant transport through heterogeneous groundwater aquifers, [Abstract], *Eos Trans. American Geophysical Union*, Vol. 79, No. 45, p. F257.

Guswa, Andrew J., D. L. Freyberg, and P. V. Roberts, 1997. Characterization of Regions of Low Peclet Number in Complex Geologic Environments, [Abstract], *Eos Trans. American Geophysical Union*, Vol. 78, No. 46, p. F293.

Guswa, Andrew J., 1994. *Design and Application of a Three-Dimensional Multiphase Finite Difference Numerical Model for Investigation of the Effects of Geologic Heterogeneities on Subsurface Flow*, undergraduate thesis, Princeton University.

OTHER INVITED PRESENTATIONS

October 2011, "Quenching our Thirst: Sustainable Water Resources for a Changing World", Smith in the City, presentation to Smith College alumnae in New York, NY.

April 2011, "Smith by Design: Environment, Action and Liberal Education," Smith Alumnae Club of Northeast Massachusetts, Rockport, MA.

December 2010, "Smith by Design: Environment, Action, and Liberal Education," Smith Alumnae group in San Francisco, CA.

November 2010, "Water, Climate, and Vegetation: Ecohydrology for a Changing World," New England Faculty Colloquium: Impacts of Climate Change, Univ. of Massachusetts, Amherst, MA.

October 2010, "Smithies in Action: Environment, Engineering, and Liberal Education," Smith Alumnae Club of Cambridge, MA.

October 2010, "Smithies in Action: Environment, Engineering, and Liberal Education," Smith Alumnae Club and Smith JYA of Geneva, Switzerland.

July 2010, "Smithies in Action: Environment, Engineering, and Liberal Education," Smith Alumnae Club of Boulder, CO.

May 2010, "Smithies in Action: Environment, Engineering, and Liberal Education," Smith Alumnae Club of Princeton, NJ.

March 2010, "Specialization is for Insects: Integration, Action, and Liberal Education," Smith Alumnae Club of Washington, DC.

February 2010, "The Importance of Dry-Season Precipitation to the Cloud Forests of Monteverde, Costa Rica," Department of Geosciences, University of Texas, Austin, TX.

July 2009, "Robert Maillart and the Inescapable Art of Bridges," given at a workshop for local middle-school teachers: "A Blueprint For Teaching Tomorrow's Engineers Today," Smith College.

February 2009, "Quenching our Thirst: Sustainable Water Resources for a Changing World," Landscape Studies, Smith College.

February 2009, "Climate Change and Water: Flood or Drought?" National Teach-in on Global Climate Change, Smith College.

November 2008, "Quenching our Thirst: Sustainable Water Resources and a Changing World," Smith College Alumnae Club of Greenwich, CT.

October 2008, "The Importance of Orographic Precipitation to the Cloud Forests of Monteverde, Costa Rica," Department of Earth Sciences, Boston University, Boston, MA.

October 2008, "Quenching our Thirst: Sustainable Water Resources and Smith College," Smith College Alumnae Club of Houston, TX.

September 2008, "Ecohydrology for a Changing World: Plant Uptake, Root Depth, and Climate," Department of Civil and Environmental Engineering, University of Massachusetts, Amherst.

May 2008, "Can Hamlet help engineers? Liberal arts and the education of engineering students," Princeton Alumni Association of Western Massachusetts, Amherst, MA.

May 2008, "Integration throughout the curriculum: Cumulative Effects," presentation at the Symposium on Engineering and Liberal Education, Union College, Schenectady, NY.

April 2008, "Ecohydrology and Engineering for a Changing World," Picker Engineering Program, Smith College.

November 2007, "Toward a Sustainable World," panel discussion for Smith College alumnae and guests, Denver Museum of Nature and Science.

March 2007, "The Importance of Dry-Season Precipitation to the Water Resources of Monteverde, Costa Rica," Department of Civil and Environmental Engineering, Stanford University.

February 2007, "The Importance of Dry-Season Precipitation to the Water Resources of Monteverde, Costa Rica," Department of Environmental Science, University of Virginia.

June 2006, "Hydrology and Water Chemistry of Monteverde, Costa Rica," The Monteverde Institute, Monteverde, Puntarenas, Costa Rica.

May 2006, "Ecohydrology and Water Resources: Learning from Costa Rica," Alumnae College, Smith College, Northampton, MA.

May 2006, "The Tower and the Bridge," Alumnae College, Smith College, Northampton, MA.

April 2006, "The Importance of Dry-Season Precipitation to the Cloud Forests of Monteverde, Costa Rica," Department of Civil and Environmental Engineering, Princeton University, Princeton, NJ.

April 2006, "Hydrology and Water Chemistry of Monteverde, Costa Rica," Centro Cientifico Tropical, San Jose, Costa Rica.

February 2006, "The Role of Dry-Season Orographic Precipitation in the Cloud Forests of Monteverde, Costa Rica," Center on Global Change, Duke University, Durham, NC.

October 2005, "The Role of Dry-Season Orographic Precipitation in the Cloud Forests of Monteverde, Costa Rica," Dept. of Civil and Environmental Engineering, Cornell University, Ithaca, NY.

September 2005, "Hurricane Katrina: What Lessons can we learn from this disaster?" panel discussion at Smith College, Northampton, MA.

May 2005, "Designing the Future: The New Picker Engineering Program," Smith College alumnae gathering, Pittsburgh, PA.

October 2004, "Scaling Up Plant Uptake in Water-Limited Ecosystems," Department of Civil and Environmental Engineering, Princeton University, Princeton, NJ.

April 2004, "The Bridges of Robert Maillart," SmithsCape, Falmouth, MA.

February 2003, "The Inescapable Art of Bridges," Landscape Studies, Smith College, Northampton, MA.

February 2002, "Watering the Garden: Hydrology, Water Resources, and Landscape," Landscape Studies, Smith College, Northampton, MA.

March 2001, "Modeling Solute Transport: Tailing Due to Low-Permeability Lenses", Dept of Civil and Environmental Engineering, University of Massachusetts, Amherst, MA.

March 2001, "Modeling Solute Transport: Tailing Due to Low-Permeability Lenses", United States Geological Survey, Water Resources Group, Reston, VA.

October 2000, "Modeling Solute Transport: Tailing Due to Low-Permeability Lenses" Department of Civil and Environmental Engineering, Princeton University, Princeton, NJ.

TEACHING INTERESTS

STRUCTURES AND THE BUILT ENVIRONMENT

This course for a general audience examines the development of large structures (towers, bridges, and domes) throughout history with emphasis on the past 200 years. Following the evolution of ideas and materials, students interpret significant works from scientific, social, and symbolic perspectives.

FLUID MECHANICS

This course, which includes a laboratory, introduces students to fundamental principles of fluid mechanics. Topics covered in this course include intensive and extensive thermophysical properties of fluids, control-volume and differential expressions for conservation laws, dimensional analysis, and external, internal, and open-channel flows.

MASS AND HEAT TRANSFER

This upper-level course introduces the processes and accompanying mathematical representations that govern the transport of heat and mass, including advection, dispersion, adsorption, conduction, convection, and radiation. Applications include environmental transport and mixing, the use of heat to measure flow speed, and separation processes.

ECOHYDROLOGY

This course focuses on the measurement and modeling of hydrologic processes and their interplay with ecosystems. Material includes the statistical and mathematical

representation of infiltration, evapotranspiration, plant uptake, and runoff over a range of scales (plot to watershed). The course introduces students to South African savannas, the cloud forests of Costa Rica, the forests of New England, and the Florida Everglades.

HYDROSYSTEMS ENGINEERING

Through systems analysis and design projects, this course introduces students to the field of water resources engineering. Topics include water use and water law, pipe and open-channel flow, economics, decision-making, the hydrologic cycle, hydropower, irrigation, flood control, and water supply. The second half of the course will address three different physical and political environments: Massachusetts, California, and the Nile River basin.

DESIGN CLINIC

This two-semester course synthesizes and marshals the students' previous coursework to address a real engineering design problem. Students work in teams on year-long design projects, usually in collaboration with industry and/or government. These projects are supplemented by course seminars to prepare students for engineering design and professional practice.

PROFESSIONAL EXPERIENCE AND SERVICE

Senior Hydrology Advisor, Natural Capital Project, 2011 - present

Delegate, Consortium of Universities for the Advancement of the Hydrologic Sciences, Incorporated, 2006 –

Living Building Challenge Workshop, March 2011, Building Energy 11 Conference and Trade Show, New England Sustainable Energy Association

Steering Committee, Water Resources Research Center Conference, University of Massachusetts, Amherst, MA, 2008 – 2010

Planning Committee, Symposia on Engineering and Liberal Education, Union College, Schenectady, NY, (Two conferences: 2009, 2010)

Associate Editor, *Water Resources Research*, 2006 – 2009

Chair, Horton Student Research Grant Committee, American Geophys. Union, 2006 –2009

Research Associate, Monteverde Institute, Monteverde, Costa Rica, 2002 – 2008

Delegate, Organization of Tropical Studies, 2004 – 2008

Member, Faculty Working Group on Climate Change, The Environmental Institute, University of Massachusetts, Amherst, MA, 2006 – 2007

Covener, Biogeosciences session B02 “Cloud Water and Fog: Hydrology, Ecology, and Chemistry,” Fall 2006 Meeting of the American Geophysical Union

Reviewer

Advances in Water Resources, Agronomy for Sustainable Development, American Naturalist, Ecosystems, Encyclopedia of Hydrological Sciences, Geography Compass, Geophysical Research Letters, Global Change Biology, Hydrological Processes, Hydrology and Earth System Sciences, Journal of Environmental Quality, Journal of Geophysical Research – Biosciences, Journal of Hydrologic Engineering, Journal of Hydrology, Journal of Hydrometeorology, Journal of Theoretical Biology, Nonlinear Processes in Geophysics, Science, Water Resources Research, National Science Foundation

Consultant

JG Environmental, Inc., Provided expert advice on the sensitivity of groundwater recharge to the interannual variability of precipitation, October 2009

Tighe & Bond, Inc., Provided expert advice on groundwater modeling, August 2005

Hopewell Township, Performed a review of groundwater resources, December 2001

Skyview Associates, Provided expert testimony on groundwater resources, April 2001

GeoTrans, Inc., Groundwater modeling and field investigations, summers 1991-1994

Engineer-in-Training, passed EIT exam spring 1995

Professional Memberships

American Geophysical Union, American Society of Civil Engineers, American Society of Engineering Education, Sigma Xi, Union of Concerned Scientists

COLLEGE AND DEPARTMENTAL SERVICE

Director, Center for the Environment, Ecol. Design and Sustainability, Smith College

The Center seeks to help students integrate knowledge within the unifying context of the environment and to empower and enable them to take on real-world environmental projects that draw upon their liberal-arts education and intellectual capacities. As Director, my activities include developing a cohesive team of staff and faculty with a shared sense of mission, working closely with development to share our ideas with alumnae and potential donors, managing our financial resources, and initiating and overseeing a range of programmatic initiatives.

Founding Faculty Member, Picker Engineering Program, Smith College

Worked with the Director and founding faculty to create the first engineering program to be offered at an all-women's college. In starting this new program, we took on the challenge of identifying and meeting the goals for engineering education in the twenty-first century and integrating them with the values and strengths of a liberal arts college. Responsibilities have included development of courses and curriculum, preparation for our first successful ABET review, and communication of program goals and strengths to students, alumnae, parents, colleagues, and employers.

Steering Committee, Env. Science and Policy Prog., Smith College, 2004 – 2010, 2011 – present

Steering Committee, Landscape Studies Program, Smith College, 2002 – 2008, 2011 – present

Committee on Sustainability, Smith College, 2011 – present

Search Committee, Assistant Professor Search, Picker Engineering Program, Smith College 2011 - 2012

Coordinating Fellow, Louise W. and Edmund J. Kahn Liberal Arts Institute, short-term project, Mill River Greenway Initiative, Smith College, 2011

Futures Initiative Steering Committee, Smith College, 2010 - 2011

Committee on Mission and Priorities, Smith College, 2007 – 2010

Organizing Fellow, Louise W. and Edmund J. Kahn Liberal Arts Institute, short-term project, Sustainable Operations: Are we on the right path?, Smith College, 2010.

Chair, Faculty Matters Committee, Picker Engineering Program, Smith College, 2006 – 2010

Advisor to the President, Center for the Environment, Ecological Design, and Sustainability initiative, Smith College, 2008 – 2009

Member, Provost-appointed group to frame curricular priorities to implement strategic plan, Smith College, 2009

Committee on Athletics, Smith College, 2006 – 2009

Faculty Fellow, Louise W. and Edmund J. Kahn Liberal Arts Institute, short-term project, The Situation and the Story: Portraying Scientific Discovery, Smith College, 2008

Chair, Search Committee, Assistant Professor Search, Picker Engineering Program, Smith College, 2007-2008

Member, Working group to develop a new major in Environmental Science and Policy, Smith College, 2007-2008 (includes attendance at the Second Environmental Studies Summit, SUNY-ESF, 7-10 June 2007)

Neilson Professor Committee, 2007

Departmental Committee on Mission and Priorities, Picker Engineering Program, Smith College, 2006 – 2007.

Chair, Junior Faculty in Science and Engineering, Smith College 2005-2006.

Faculty Fellow, Louise W. and Edmund J. Kahn Liberal Arts Institute, year-long project, Form and Function, Smith College, 2005-2006.

Search Committee, Director Search, Picker Engineering Program, Smith College, 2004-2005

Search Committee, Assistant Professor Search, Picker Engineering Program, Smith College, 2004-2005.

Chair, Search Committee, Lab Instructor Search, Picker Engineering Program, Smith College, Spring 2003.