

Curriculum Vitae: Alex S. Mayer

Department of Civil & Environmental Engineering & Sciences office: (906) 487-3372
1400 Townsend Dr. fax: (906) 487-3371
Michigan Technological University home: (906) 483-0818
Houghton, MI 49931-1295 email: asmayer@mtu.edu

Education

Brown University, Sc.B. Civil/Environmental Engineering, 1981
University of North Carolina at Chapel Hill, M.S. Environmental Engineering, 1987
 Title: Development of a three-dimensional groundwater flow model
University of North Carolina at Chapel Hill, Ph.D. Environmental Engineering, 1992
 Title: An investigation of residual nonaqueous phase liquid dissolution in saturated groundwater systems

Professional Experience

2018-present
 University Professor
 Dept. Civil and Environmental Engineering /Dept. Geological & Mining Engineering and Sciences
 (joint appointment)
 Michigan Technological University, Houghton, Michigan

2016-2018
 Charles and Patricia Nelson Presidential Professor
 Dept. Civil and Environmental Engineering /Dept. Geological & Mining Engineering and Sciences
 (joint appointment)
 Michigan Technological University, Houghton, Michigan

2005-2011
 Director, Center for Water & Society
 Michigan Technological University, Houghton, Michigan

2001-2016
 Full Professor
 Dept. Civil and Environmental Engineering /Dept. Geological & Mining Engineering and Sciences
 (joint appointment)
 Michigan Technological University, Houghton, Michigan

1998-2001
 Associate Professor
 Dept. Geological Engineering and Sciences/Dept. Civil and Environmental Engineering (joint
 appointment)
 Michigan Technological University, Houghton, Michigan

2000-2001
 Visiting Scholar
 Department of Civil Engineering
 Technical University of Delft, Delft, The Netherlands

1995-1995

Visiting Professor
Department of Chemical Engineering/Department of Geology
University of Sonora, Hermosillo, Mexico

1992-1998

Assistant Professor
Dept. of Geological Engineering and Sciences/Dept. Civil and Environmental Engineering (joint appointment)
Michigan Technological University, Houghton, Michigan

1992-present

Professional Consultant in Hydrogeology
Houghton, Michigan

1985-1991

Research Assistant
Department of Environmental Sciences and Engineering
University of North Carolina, Chapel Hill, North Carolina

1981-1985

Junior and Assistant Civil Engineer
Water Resources Projects Section, Planning Division
East Bay Municipal Utility District, Oakland, California

Professional Registration

Registered Professional Engineer in State of California.

Awards

Inaugural University Professor, 2018-present
Charles and Patricia Nelson Presidential Professor, 2016-2018
Michigan Technological University Research Award, 2015
Lake Superior Binational Forum Environmental Stewardship Award, 2011
Manierre Award, Huron Mountain Wildlife Foundation, 2010
Distinguished Faculty Service Award, Michigan Technological University, 2009
Rudolf Hering Medal, American Society of Civil Engineers, 2009
Recognition Award for Rural Sustainable Development, Secretary of Social Development, Mexico, 2007
Fulbright Fellowship (Netherlands), 2000-2001
James M. Montgomery Consulting Engineers Southeast Region Scholarship, 1990-1991
Board of Governors Fellowship for Doctoral Research, University of North Carolina, 1987-1990
Daniel A. Okun Scholarship for Master's Research, University of North Carolina, 1985-1986

Publications (108 peer-reviewed journal articles, books, book chapters, report and proceedings articles accepted, published, or in press)

Peer-Reviewed Journal Articles (69 accepted, published or in press; 6 in review)

Berry, Z.C. Jones, K.W., Gomez Aguilar L., Congalton, R.G., Holwerda, F., Kolka, R., Looker, N., Manson, R., Mayer, A., and 8 others, Evaluating ecosystem service trade-offs along a land-use intensification gradient in central Veracruz, Mexico, *Ecosystem Services*, in review.

- Jones, K.W., Mayer, A., Lopez Ramirez, S.L., Von Thaden Ugalde, J.J., Manson, R., Berry, Z.V., and Asbjornsen, H. 2019. Integrating impact evaluation and ecosystem service modeling to measure the net economic benefit of Payments for Hydrological Services Programs in Mexico, *Ecological Economics*, in review.
- Lopez Ramirez, S.L., Sáenz, L., Muñoz-Villers, L. E. Asbjornsen, H., Berry, Z.C. Looker, N., Manson, R. Gomez, Aguilar, L.R. 2019. Land use change effects on catchment streamflow response in a humid tropical montane cloud forest region, central Veracruz, Mexico, *Hydrologic Processes*, in review
- Heidari, A., Watkins, Jr., D., Mayer, A., Propato, T., Verón, S., de Abelleira, D. 2019. Spatially variable hydrologic impact and biomass production tradeoffs associated with Eucalyptus cultivation for biofuel production in Entre Rios, Argentina, *Hydrologic and Earth Systems Science*, in review.
- Spellman, P., Webster, V., Gulley, J. and Mayer, A. 2019. Subsurface heterogeneity and its impact on flood risk estimation, *Journal of Flood Risk Management*, in review.
- Gupta, L., Mayer, A.S., Eastmond, A. 2019. Choices of drinking water in a rural Mexican community are driven by perceived health risk aversion, *Water Economics and Policy*, in review.
- Ward, F., Mayer, A., Garnica, L., Townsend, N., Gutzler, D. 2019. Economics of aquifer protection under climate-water stress uncertainty: New insights from hydro-economic optimization modeling, *Journal of Hydrology*, 576, 667-684.
- Heidari, A., Mayer, A., Watkins, Jr., D. 2019. Hydrologic impacts and trade-offs associated with forest-based bioenergy development practices in a snow-dominated watershed, Wisconsin, USA, *Journal of Hydrology*, 574, 421-429.
- Alian, S., Mayer, A.S., Maclean A., Watkins, Jr., D.W. and Mirchi A. 2019. Spatiotemporal dimensions of water stress accounting: incorporating groundwater–surface water interactions and ecological thresholds, *Environmental Science & Technology*, 53, 2316-2323.
- Walkons, C., Mayer A., Datta, R. and Sarkar, D. 2018. Assessment of water treatment residuals as sorbent material in permeable reactive barriers: Application to a copper-contaminated site, *Remediation Journal*, 29, 45-51.
- Essenfelder, A.H., Pérez-Blanco, D.I., and Mayer A.S. 2018. Rationalizing systems analysis for the evaluation of adaptation strategies in complex human-water systems, *Earth's Future*, 6, <https://doi.org/10.1029/2018EF000826>.
- González-Morales, S.B., A. Mayer, and N. Ramirez. 2018. Assessment of soil erosion vulnerability in the heavily populated and ecologically fragile communities in Motozintla de Mendoza, Chiapas, Mexico, *Solid Earth*, 9, 745–757.
- Kozich, A.T., Halvorsen, K.E., and Mayer, A.S. 2018. Perspectives on water resources among Native American and Non-Native residents of the Great Lakes region, *Journal of Contemporary Water Research and Education*, 163, 94-108.
- Mayer, A., Vivoni, E., Kossak, D., Halvorsen, K., Robles-Morua, A. 2016. Participatory modeling workshops in a water-stressed basin result in gains in modeling capacity but reveal disparity in water resources management priorities, *Water Resources Management*, <https://doi.org/10.1007/s11269-017-1775-6>.
- Gulley J.D., Mayer A.S., Martin J.B. and Bedekar V. 2016. Sea level rise and inundation of island interiors by elevated water tables: assessing impacts of lake formation and evaporation on water resources in arid climates, *Geophysical Research Letters*, 43(8): 9712-9719.
- Mayer, A., Mubako, S., and Ruddell, B. 2016. Developing the greatest blue economy: Water productivity, fresh water depletion, and virtual water trade in the Great Lakes basin, *Earth's Future*, doi:10.1002/2016EF000371.
- Norris, P., O'Rourke, M., Mayer A.S., and Halvorsen, K.E. 2016. Doubling down: The wicked problem of forming transdisciplinary teams to address wicked problems in socio-ecological systems, *Journal of Landscape and Urban Planning*, doi:10.1016/j.landurbplan.2016.01.008.
- Halvorsen, K.E., Knowlton, J.L., Mayer, A.S., Phifer, C.C., and others. 2015. A case study of strategies for fostering international, interdisciplinary research, *Journal of Environmental Studies and Sciences*, 1-11, doi: 10.1007/s13412-015-0336-7.

- Asbjornsen, H., Mayer, A. S., Jones, K. W., Selfa, T., Saenz, L., Kolka, R. K., and Halvorsen, K. E. 2015. Assessing impacts of payments for watershed services on sustainability in coupled human and natural systems. *BioScience*, 65(6), 579-591.
- Watkins, Jr., D.W., Moraes, M.M.G.A., Asbjornsen, H., Mayer A.S., Licata, J., Gutierrez Lopez, J., Pypker, T., Gamez Molina, V., Fernandes Marques, G., Guimaraes Carneiro, A.C., Nuñez, H.M., Önal, H., and da Nobrega Germano, B. 2015. Bioenergy development policy and practice must recognize potential hydrologic impacts: Lessons from the Americas, *Environmental Management*, 10.1007/s00267-015-0460-x.
- LaBeau, M., Mayer, A.S., Webster, V.G., Watkins, Jr., D., Robertson, D., and Gyawali, R. 2015. The importance of considering shifts in seasonal changes in discharges when predicting future phosphorus loads in streams, *Biogeochemistry*, 126, 153-172.
- Pastel, R., Seigel, M., Zhang, W. and Mayer, A. 2015. Team building in multidisciplinary client-sponsored project courses, *ACM Transactions on Computing Education (TOCE), Special Issue on Team Projects in Computing Education*, 15, 19.
- Becker, J., Wesseldyke, E.S., Seagren, E.A., Mayer, A.S., Zhang, C. 2014. Numerical modeling analysis of hydrodynamic and microbial controls on DNAPL pool dissolution and detoxification: Dehalorespirers in co-culture, *Advances in Water Resources*, doi:10.1016/j.advwatres.2015.01.009.
- Robles-Morua, A., Halvorsen, K.E., Mayer, A.S., and Vivoni, E. 2014. Exploring the application of participatory modeling approaches in the Sonora River Basin, Mexico, *Environmental Modelling and Software*, 52, 273–282.
- Robles-Morua, A., Che, D., Mayer, A., and Vivoni, E. 2014. Hydrologic assessment of proposed reservoirs in the Sonora River Basin, Mexico, under historical and forecasted climate scenarios, *Hydrological Sciences Journal*, DOI:10.1080/02626667.2013.878462.
- Wright, S.G., Muralidharan, D., Mayer, A.S. and Breffle, W.S. 2014. Willingness to pay for improved water supplies in rural Ugandan villages, *Journal of Water, Sanitation and Hygiene for Development*, 4(3), 490-498.
- LaBeau, M.B., Robertson, D.M., Mayer, A.S., Pijanowski, P.J. and Saad, D.A. 2014. Effects of future urban and biofuel crop expansions on the riverine export of phosphorus to the Laurentian Great Lakes, *Ecological Modelling*, 277, 27-37.
- Mayer, A.S., Winkler, R., and Fry, L. 2014. Classification of watersheds into integrated social and biophysical indicators with clustering analysis, *Ecological Indicators*, 45, 340-349.
- Watson, K., Mayer, A.S., Reeves, H. 2013. Groundwater availability as constrained by hydrogeology and environmental flows, *Ground Water*, 52, 225–238, DOI: 10.1111/gwat.12050.
- Mubako, S., Ruddell, S. and Mayer, A. 2013. The relationship between water withdrawals and freshwater ecosystem water scarcity quantified at multiple spatio-temporal locations and scales for a Great Lakes watershed, *Journal of Water Resources Planning and Management*, 139(6), 671–681.
- LaBeau, M.B., Gorman, H., Mayer, A.S., Dempsey, D., and Sherrin, A. 2013. Phosphorus monitoring in the U.S. portion of the Laurentian Great Lake Basin: Drivers and challenges, *Journal of Great Lakes Research*, 39(4), 569-577.
- Eckman, B., Febowitz, M., Mayer, A., and Riabov, A., 2012. Toward an integrative software infrastructure for water management in the Smarter Planet, *IBM Journal of Research and Development*, 54, 1-20, DOI: 10.1147/JRD.2010.2048972.
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- Van Grinsven, M., Mayer, A.S., and Huckins, C. 2011. Estimation of streambed groundwater fluxes associated with coaster brook trout spawning habitat, *Ground Water*, doi: 10.1111/j.1745-6584.2011.00856.x.

- Muñoz-Hernandez, A., Mayer, A.S., and Watkins, Jr., D. 2011 Integrated hydrologic-economic-institutional water resources management model for the Rio Yaqui basin, Sonora, Mexico, *Journal of Water Resources Planning and Management*, 137, 227–237.
- Robles-Morua, A., Halvorsen, K.E., and Mayer, A.S. 2011. Waterborne disease-related risk perceptions in the Sonora River Basin, Mexico, *Risk Analysis*, 31(5), 866-878.
- Kolka, R.K., Giardina, C.P., McClure, J.D., Mayer, A.S., and Jurgensen, M.F. 2010. Partitioning hydrologic contributions to an ‘old-growth’ riparian area in the Huron Mountains of Michigan, USA, *Ecohydrology*, DOI: 10.1002/eco.112.
- Nesbit, S. and Mayer, A. 2010. Shifting attitudes: The influence of field trip experiences on student beliefs, *Transformative Dialogues: Teaching & Learning Journal*, 4(2), 1-22.
- Mayer, A.S. and Muñoz-Hernandez, A. 2009. Integrated water resources optimization models: An assessment of a multidisciplinary tool for sustainable water resources management strategies, *Geography Compass*, 3, 1176–1195, DOI 10.1111/j.1749-8198.2009.00239.x.
- Mayer, A.S., Sandman, T., and M. Breidenbach. 2008. The effect of flow regime on physical non-equilibrium transport in unsaturated porous media, *Vadose Zone Journal*, 7, 981–991, 2008.
- Bau, D. and Mayer, A.S., 2008. Optimal design of pump-and-treat systems under uncertain hydraulic conductivity and plume distribution, *Journal of Contaminant Hydrology*, 100, 30-46.
- Mayer, A.S., May, W., Lukkarila, C. and Diehl, J. 2007. Estimation of fault zone conductance by calibration of a regional groundwater flow model – Desert Hot Springs, California, *Hydrogeology Journal*, DOI 10.1007/s10040-007-0158-0.
- Mayer, A.S. and Endres, K.L. 2007. Simultaneous optimization of contaminant source and plume remediation, *Journal of Contaminant Hydrology*, 91, 288-311, DOI 10.1016/j.jconhyd.2006.11.009.
- Endres, K.L., Mayer, A.S., and Hand, D.W. 2007. Groundwater treatment modeling in the optimal design of pump-and-treat groundwater remediation systems, *Journal of Environmental Engineering*, 133, 809-818.
- Bau, D. and Mayer, A.S. 2007. Data-worth analysis for multi-objective optimal design of pump-and-treat remediation systems, *Advances in Water Resources*, 30, 1815-1830, DOI 10.1016/j.advwatres.2007.02.008.
- Ilija Ojeda, M., Mayer, A.S., and Solomon, B.D. 2007. Economic valuation of environmental services sustained by water flows in the Yaqui River delta, *Ecological Economics*, DOI 10.1016/j.ecolecon.2007.06.006.
- Robles, A., Mayer, A.S., and Durfee, M.H. 2007. Community partnered projects: a case study of a collaborative effort to improve sanitation in a marginalized community in Northwest Mexico, *Environment, Development and Sustainability*, 11, 197-213, DOI 10.1007/s10668-007-9104-5.
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- Erickson, M., Mayer A.S., and Horn, J. 2001. The niched Pareto genetic algorithm 2 applied to the design of groundwater remediation systems, *Evolutionary Multi-Criteria Optimization, Lecture Notes in Computer Science*, Springer-Verlag, Berlin, 681-695.
- Mayer, A.S. and Huang, C. 1999. Development and application of a coupled-process parameter inversion model based on maximum likelihood estimation method, *Advances in Water Research*, 22(8), 841-853.

- Mayer, A.S., L. Zhong, and Pope, G.A. 1999. Measurement of mass transfer rates for surfactant-enhanced solubilization of nonaqueous phase liquids, *Environmental Science & Technology*, 33, 2965-2972.
- Mayer, A.S. and Lenhard, R.J. 1998. Recent advances in modeling the flow and transport of nonaqueous phase liquids in subsurface systems, co-editors, *Advances in Water Resources*, 21(2), 75-181, 1998.
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- Mitchell, R.J. and Mayer, A.S. 1998. Significance of transient and hysteretic flow in modeling transport in unsaturated porous media, *Soil Science Society of America Journal*, 62(6) 1506-1512.
- Gierke, J.S., Mayer, A.S. and Shonnard, D.R. 1998. Multidisciplinary subsurface remediation courses: fundamentals, experiments and design projects, *Journal of Engineering Education*, 87(5), 555-566.
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- Mayer, A.S. and Miller, C.T. 1996. The influence of mass transfer characteristics and porous media heterogeneity on nonaqueous phase liquid dissolution, *Water Resources Research*, 32(6), 1551-156.
- Mayer, A.S., Carriere, P.P.E., Green, M.L., Mitchell, R.J., Pennell, K.D., Rabideau, A.R., Russell, K.T., Sandman, T.M. and Young, T.M. 1996. Groundwater quality, *Water Environment Research*, 68(4), 662-720.
- Mayer, A.S., Mitchell, R.J., Carriere, P.P.E., Hein, G.L., Rabideau, A.R., and Wojick, C.L. 1995. Groundwater quality, *Water Environment Research*, 67(4), 629-685.
- Mayer, A.S., Imhoff, P.T., Mitchell, R.J., Rabideau, A.R., McBride, J.F., and Miller, C.T. 1994. Groundwater quality, *Water Environment Research*, 66(4), 532-585, 1994.
- Mayer, A.S. and Miller, C.T. 1993. The influence of porous media characteristics and measurement scale on pore-scale distributions of residual nonaqueous phase Liquids, *Journal of Contaminant Hydrology*, 11, 189-213.
- Mayer, A.S. and Miller, C.T., 1993. An experimental investigation of pore-scale distributions of nonaqueous phase liquids at residual saturation, *Transport in Porous Media*, 10(1), 57-80.
- Mayer, A.S., Rabideau, A.R., Imhoff, P.T., Lowry, M.I., and Miller, C.T. 1993. Groundwater quality, *Water Environment Research*, 65(4), 486-534, 1993.
- Mayer, A.S., Rabideau, A.R., and Miller, C.T. 1992. Groundwater, *Water Environment Research*, 64(4), 535-570.
- Miller, C.T., Rabideau, A.R., and Mayer, A.S. 1991. Groundwater, *Research Journal of the Water Pollution Control Federation*, 63(4), 552-593.
- Miller, C.T. and Mayer, A.S. 1990. Groundwater: A review of the 1989 literature, *Research Journal of the Water Pollution Control Federation*, 62(5), 700-737.
- Miller, C.T., M.M. Poirier-McNeill, and Mayer, A.S. 1990. Dissolution of trapped nonaqueous phase liquids: mass transfer characteristics, *Water Resources Research*, 26(11), 2783-2796, 1990.
- Miller, C.T. and Mayer, A.S. 1989. Groundwater, *Journal of the Water Pollution Control Federation*, 61(6), 954-984. Miller, C.T. and Mayer, A.S. 1989. Groundwater, *Journal of the Water Pollution Control Federation*, 61(6), 954-984.

Co-Edited Book

- Mayer, A.S. and Hassanizadeh, S.M. 2005. *Soil and Groundwater Contamination: Nonaqueous Phase Liquids*, American Geophysical Union, Washington, DC.

Peer-Reviewed Book Chapters (12 book chapters)

- Golden, D., Mayer, A., McLaren, B., Dampier, J., Maher, P., Smith, M., and Stroink, M. 2014. Synchronous e-learning on rural sustainability: A reflection on course delivery with six universities

- across Canada, Mexico, and the United States. In H. Muga, and K. Thomas (Ed.), *Cases on Pedagogical Innovations for Sustainable Development*. Hershey, PA: IGI Global, pp. 565-583.
- Auer, M.T., Auer, N.A., Barkdoll, B.B., Bornhorst, T.J., Brooks, C., Dempsey, D., Doskey, P.V., Green, S.A., Hyslop, M.D., Kerfoot, W.K., Mayer, A.S., Perlinger, J.A., Shuchman, R., Urban, N.R. and Watkins, Jr., D.W. 2012. The Great Lakes: Foundations of physics, hydrology, water chemistry, and biodiversity. In, J. Schnoor (ed.), *Water Quality and Sustainability*, Elsevier Publishers, London.
- Auer, M.T., Auer, N.A., Barkdoll, B.B., Bornhorst, T.J., Brooks, C., Dempsey, D., Doskey, P.V., Green, S.A., Hyslop, M.D., Kerfoot, W.K., Mayer, A.S., Perlinger, J.A., Shuchman, R., Urban, N.R. and Watkins, Jr., D.W. 2012. The Great Lakes: Nutrients, sediments, persistent pollutants, and policy perspectives for a sustainable future. In, J. Schnoor (ed.), *Water Quality and Sustainability*, Elsevier Publishers, London.
- Gillespie, J. and Mayer, A. 2014. Exploration of the hydrogeology of the Mission Creek Fault: Faulting as a barrier to groundwater flow, *Palms to Pines Guidebook*, South Coast Geological Survey, Santa Ana, California, pp. 151-155.
- Honrath, Jr., R.E., Mihelcic, J.R., Zimmerman, J.B. and Mayer, A.S. 2009. Physical Processes, *Environmental Engineering: Fundamentals Sustainability, Design*, John Wiley & Sons, Hoboken, New Jersey.
- Auer, M.T., Mihelcic, J.R., Urban, N.R., Mayer, A.S., and Penn, M.R. 2009. Water Quality, *Environmental Engineering: Fundamentals Sustainability, Design*, John Wiley & Sons, Hoboken, New Jersey.
- Whitman, B.E., Mihelcic, J.R., and Mayer, A.S. 2009. Water Supply, Distribution, and Wastewater Collection, *Environmental Engineering: Fundamentals Sustainability, Design*, John Wiley & Sons, Hoboken, New Jersey.
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- Mayer, A. S. and M. Oostrom. 2005. Site characterization and monitoring, *Soil and Groundwater Contamination: Nonaqueous Phase Liquids*, American Geophysical Union, Washington, DC.
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- Pinder, G.F., Mayer, A.S., and others. 2002. Optimization and modeling for remediation and monitoring, *Environmental Modeling and Management: Theory, Practice, and Future directions*, edited by Calvin C. Chien, Du Pont Co., Dover, Delaware, Today Media, 111-186.
- Mayer, A.S. 2001. Laboratory study of plug flow reactors, *Environmental Engineering Processes Laboratory Manual*, (Eds: SE Powers, J Bisogni, J Burken, K Pagilla), Association of Environmental Engineering and Science Professors, Champaign IL, 2001.

Peer-Reviewed Proceedings (26 refereed proceedings articles)

- Villanueva-Rosales, N., Garnica-Chavira, L., Rajkarnikar-Tamrakar, S., Pennington, D., Vargas-Acosta R.A., Ward, F., and Mayer, A.S. 2017. Capturing scientific knowledge for water resources sustainability in the Rio Grande area, Second International Workshop on Capturing Scientific Knowledge, December 4th, 2017, Austin, Texas, USA, accepted.
- Mayer, A.S., Golden, D.M., Maher, P.T., and Stroink, M. 2015. A multi-national, multi-disciplinary, multi-platform course on rural sustainability, 7th International Conference on Engineering Education for Sustainable Development, Vancouver, Canada, June 9-12, 2015, accepted.
- Whitten, G., Hann, M., Robles-Morua, Mayer, A.S. and E.R. Vivoni. 2014. Enhancing the link between surface and groundwater models for climate change assessment of water supply and demand in northwest Mexico, In: Ames, D.P., Quinn, N.W.T., Rizzoli, A.E. (Eds.), *Proceedings of the 7th*

- International Congress on Environmental Modelling and Software, June 15-19, San Diego, California, USA.
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- Kemppainen, A.J., Mayer, A.S., Huntoon, J.E. 2007. Introducing sustainable design into first year engineering education, *2007 ASEE North Midwest Section Conference*, Houghton, Michigan, September 20-22, 2007.
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- Endres, K. and Mayer, A.S. 2004 Using remediation time as an optimization variable in groundwater remediation systems, *Proceedings of the 15th International Conference on Computational Methods in Water Resources (CMWR XV)*, June 13-17, 2004 Chapel Hill, NC, USA, C.T. Miller et al., editors, Elsevier, Amsterdam, pp. 535-543.
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- Huang, C. and A. S. Mayer. 1997. Computational challenges associated with mathematical optimization of soil and groundwater remediation systems, *Next Generation Environmental Models and Computational Methods, Society of Industrial and Applied Mathematics*, 287-291.
- Sorby, S. A., A. S. Mayer, and J.G. Johnson. 1996. Development of a pre- and post-processing framework for groundwater flow modeling, *Computers and Their Applications, Proceedings of the ISCA 11th International Conference, International Society for Computers and Their Applications*, Raleigh, North Carolina, 118-121.
- Huang, C. and A. S. Mayer. 1996. The role of uncertainty in the optimization of groundwater remediation systems, *Proceedings of the XIth International Conference on Computational Methods in Water Resources*, Computational Mechanics Publ., Southampton, UK, 359-366.
- Huang, C. and A. S. Mayer. 1995. Development of dynamic groundwater remediation strategies for variable aquifer configurations, *Water Resources Planning for the 21st Century, Proceedings of the 22nd Annual Conference*, American Society of Civil Engineers, 840-843.
- Huang, C. and A. S. Mayer. 1995. Dynamic optimal control for groundwater remediation management using genetic algorithms, *Models for Assessing and Monitoring Groundwater Quality*, IAHS Publication No. 227, International Association of Hydrologic Sciences, 149-155.
- Mitchell, R. J. and A. S. Mayer. 1995. Effects of transient-hysteretic flow on nonreactive solute transport in the vadose zone, *Vadose Zone Hydrology: Cutting across the Disciplines*, Hydrologic Science, University of California, Davis, 74(43), 95-106.

- Mayer, A. S., 1994. Application of domain decomposition techniques for multiphase groundwater problems, *Proceedings of the Xth International Conference on Computational Methods in Water Resources*, Kluwer Academic Publ., Dordrecht, Germany, 951-958.
- Mitchell, R. J. and A. S. Mayer. 1994. A modified method of characteristics technique for simulating contaminant transport in variably saturated porous media, *Proceedings of the Xth International Conference on Computational Methods in Water Resources*, Kluwer Academic Publ., Dordrecht, Germany, 505-512.
- Mayer, A. S., V. J. Wildfong, and R. A. Voigt. 1994. Modeling the Fate of Hazardous Compounds in Conventional Wastewater Treatment within a Waste Minimization Framework, *Computer Techniques in Environmental Studies V*, Vol. I, Computational Mechanics Publications, Southampton, UK, 191-198.
- Johnson, J., A. S. Mayer, and S. Sorby. 1994. Development of an efficient pre- and post-processing framework for groundwater flow and transport models, *Computer Techniques in Environmental Studies V*, Vol. II, Computational Mechanics Publications, Southampton, UK, 77-84.
- Mayer, A. S. and C. T. Miller. 1992. Simulating nonaqueous phase dissolution in heterogeneous porous media, *Proceedings of the Ninth International Conference on Computational Methods in Water Resources*, Vol. 2, Computational Mechanics Publications, Southampton, UK, 247-254.
- Mayer, A.S. and C.T. Miller. 1990. A compositional model for simulating multiphase flow, transport, and mass transfer in groundwater systems, *Proceedings of the VIIIth International Conference on Computational Methods in Water Resources, Subsurface Hydrology*, Venice, Italy, June 1990, 217-222.
- Mayer, A.S. and C.T. Miller. 1990. Equilibrium and mass-transfer limited approaches to modeling multiphase groundwater systems, Environmental Engineering, *Proceedings of the 1990 Specialty Conference*, American Society of Civil Engineers, Arlington, VA, July 1990, 314-321.
- Mayer, A.S. and C.T. Miller, A three-dimensional flow model for analysis of remediation efforts at a polluted coastal aquifer, *Proceedings of the American Water Resources Association Symposium on Coastal Water Resources*, Wilmington, NC, May 1988, 531-541, 1988.
- Mayer, A.S. and C.T. Miller, A three-dimensional finite element-finite difference model for simulating confined and unconfined groundwater flow, *Proceedings of the VIIth International Conference on Computational Methods in Water Resources*, Vol. 1, Boston, MA, June 1988, 89-94, 1988.

Refereed Report

- Pentland, R. and A. Mayer. 2015. Ten Year Review of the International Joint Commission's Report on "Protection of the Waters of the Great Lakes," International Joint Commission, Ottawa, Canada and Washington DC, accepted.

Non-Refereed Conference Proceedings

- Perlanger, J.A., Paterson, K.G., Mayer A.S., Griffis, V.G., and Holles, K.L. 2013. Assessment of a sustainability program in graduate civil and environmental engineering education, *Proceedings. 43rd Annual Meeting of the Frontiers in Education Conference*, Oklahoma City, October 23-26, 2013.
- Mayer, A. Climate change impacts on freshwater ecosystem services in the Laurentian Great Lakes, *Indo-US Bilateral Workshop on Global Challenges: Climate Change, Water, Environment and Society*, ITM University, Gurgaon, India, March 5-6, 2012.
- Mayer, A. Using surfactants to enhance the cleanup of organic liquid contaminants in groundwater systems, *Second Seminar on Coastal Aquifers in Sonora*, University of Sonora, Hermosillo, Mexico, October 1998.
- Mayer, A. Contamination of coastal aquifers from saltwater intrusion: Examples and applications of mathematical models, *First Seminar on Coastal Aquifers in Sonora*, University of Sonora, Hermosillo, Mexico, November 1997.

Non-Refereed Book Chapter

Mayer, A. 2016. Fate of chemicals in the water environment, Chemistry for Changing Times, JW. Hill and T.W. McCreary, eds., Pearson Educational, pp. 431.

Other Publications

- Kersten, L. and Mayer, A.S., Watershed Management Plan for Huron Creek, Michigan, Michigan Department of Environmental Quality, Lansing, Michigan, 2009.
- Mayer, A.S. and W.L. May, "Mathematical Modeling of Proposed Artificial Recharge for the Mission Creek Subbasin," Report for the Mission Springs Water District, Desert Hot Springs, CA, 1998.
- Miller, C.T. and Mayer, A.S. , "NAPL Dissolution in Heterogeneous Porous Media," *Center for Multiphase Research News* 2(2), 1-5, University of North Carolina at Chapel Hill, 1996.
- Mayer, A.S., "Supercomputer Modeling of Groundwater Contamination by Nonaqueous Phase Liquids," *Cray Channels*, 17(2), 18-21, Cray Research, Inc., Eagan, Minnesota, 1995.
- Miller, C.T., F.K. Pfaender, Mayer, A.S. and D.C. Dobbins, "Investigation of Aquifer Response to Purge-Well Rehabilitation," Final Report for Robert S. Kerr Environmental Research Laboratory, U.S. Environmental Protection Agency, Project CR-814625, Ada, OK, 1990.
- Miller, C.T., D.J. Crawford-Brown, and Mayer, A.S., "Development of a Variable, Dual-Energy Attenuation Method for Measuring Fluid Saturations in Multiphase Systems," Final Report for University of North Carolina Biomedical Research Support Grant, Chapel Hill, NC, 1989.

Presentations (1997-2017)Conferences and Workshops

- "Well Location Optimization for Heterogeneous Aquifer Remediation," American Society of Civil Engineering Water Resources Planning and Management Conference, Houston, Texas, April 1997.
- "Coupling Risk and Cost in a Multi-Objective Framework for Optimizing Remediation Design," Society of Industrial and Applied Mathematics Geosciences Conference, Albuquerque, New Mexico, June 1997.
- "Development of a Multidisciplinary Curriculum to Address Subsurface Remediation Education," International Conference on Engineering Education, Chicago, Illinois, August 1997.
- "The Influence of the San Andreas Fault on Groundwater Flow in the Upper Coachella Valley, California: A Mathematical Modeling Investigation, poster presented at Penrose Conference on Fluid Flow and Faults, Taos, New Mexico, September 1997. *invited*
- "Using Surfactants to Enhance Solubilization of Organic Liquid Contaminants in Groundwater Systems," ECODES '98, University of Matanzas, Cuba, June 1998. *invited*
- "Nonequilibrium Behavior in Surfactant-Enhanced Solubilization of Nonaqueous Phase Liquids," Gordon Research Conference, Proctor, New Hampshire, August 1998.
- "Interphase Mass Transfer in NAPL-Contaminated Groundwater Systems," special session co-chair, Fall Meeting of the American Geophysical Union, San Francisco, California, December 1998.
- "Nonequilibrium Mass Exchange in Surfactant-Enhanced Solubilization of a Nonaqueous Phase Liquid," Fall Meeting of the American Geophysical Union, San Francisco, California, December 1998.
- "Visualization of Surfactant-Enhanced Nonaqueous Phase Liquid Mobilization and Solubilization Phenomena at the Micro-Scale," 24th General Assembly of the European Geophysical Society, The Hague, Netherlands, April 1999.
- "Modeling Nonequilibrium Solute Transport Under Transient Flow Conditions with Steady State Flow and Transport Parameters," 24th General Assembly of the European Geophysical Society, The Hague, Netherlands, April 1999.

- “Applications of Saltwater Intrusion Modeling to the Guaymas Valley Aquifer, Sonora, Mexico,” University of Sonora, Sonora, Mexico, October, 1999. *workshop presenter.*
- “Saltwater Intrusion into a Northwest Mexico Coastal Aquifer,” Conference on Ecology and Sustainable Development (ECODES 2000), Matanzas, Cuba, June 2000, *invited*
- “Uncertainty- The Most Significant Technological Limitation” Environmental Modeling Expert Workshop, Pennsylvania State University, August 2000. *invited panel member and speaker*
- “Multi-Scale Mass Transfer Limitations in Nonaqueous Phase Dissolution,” Workshop on Subsurface Flow and Transport Phenomena, Delft Technical University, Netherlands, October, 2000. *invited*
- “Optimization Methods for Subsurface Remediation Design,” Workshop on Subsurface Flow and Transport Phenomena, Delft Technical University, Netherlands, October 2000. *short course teacher*
- “Pore scale analysis of nonaqueous phase liquid dissolution and surfactant-enhanced solubilization,” Society of Industrial and Applied Mathematics Geosciences Conference, Boulder, Colorado, June 2001. *invited*
- “Using multi-objective optimization to construct tradeoff curves for subsurface remediation,” Society of Industrial and Applied Mathematics Geosciences Conference, Boulder, Colorado, June 2001. *invited*
- “Development of multi-objective optimization algorithms for assessing tradeoffs between cost, reliability, and cleanup goals for subsurface remediation,” XIIth International Conference on Computational Methods in Water Resources, Delft, Netherlands, July 2002.
- “Contamination of Soil and Groundwater by Nonaqueous Phase Liquids,” Delft Technical University, Netherlands, July 2002. *short course organizer and teacher*
- “Development of Multi-Objective Optimization Algorithms for Assessing Tradeoffs Between Cost, Reliability, And Cleanup Goals for Subsurface Remediation,” XII Conference on Computational Methods in Water Resources, Delft, Netherlands, July 2002.
- “Incorporation of uncertainty in hydraulic conductivity and source strength into a multi-objective optimization algorithm for designing subsurface remediation systems,” IX Mexican American Exchange in Mathematics and its Applications (MAXIMA), Morelos, Mexico, August 2002. *invited*
- “Optimization of Engineering Design of Subsurface Environmental Remediation Systems– Development & Testing of Community Benchmark Problems,” Large–Scale Computer Models for Environmental Systems- Simulation and Optimization Workshop, Research Triangle Park, North Carolina, April 2003. *invited*
- “Optimization of Engineering Design of Subsurface Environmental Remediation Systems- Development and Testing of Community Benchmark Problems,” American Geophysical Union, Fall Meeting, San Francisco, December 2003.
- “Sustainability Analysis in Water Resources Management and Potential Application to Sonora, Mexico,” Third Forum on Water, University of Sonora, Hermosillo, Mexico, May 2004. *invited*
- “NAPL Dissolution: Field Scale Modeling,” DNAPL Source Zone workshop, Tucson, Arizona, February, 2005. *invited*
- “Building Human Capacity to Improve Water and Sanitation in Rural Sonora,” TIES Workshop 2006, Guadalajara, Mexico, February 2006. *invited*
- “Modeling the Rio Yaqui basin, Mexico- Optimization of water resource allocation,” GeoCuenca 2006, Havana, Cuba, June 2006. *invited*
- “Training A New Generation of Water Resource Experts,” Higher Education in Development/USAID Meeting, Washington DC, August 2006. *invited*
- “Crecimiento de Ciudades: la Población, el Agua y su Infraestructura,” North American Mobility Program Conference, Guanajuato, Mexico, October, 2006. *invited*
- “Sustaining the Project: “Training a Core of Water Resource Experts,” TIES Workshop 2007, Querétaro, Mexico, June 2007. *invited*
- Workshop on “Complex Interacting Systems for a Sustainable Future,” National Science Foundation, Tampa, Florida, June 2007. *invited panelist*

- “Associations Between Groundwater-Surface Water Dynamics and Coaster Brook Trout Spawning Habitat in the Salmon Trout River, Marquette County, Michigan,” Annual Meeting Ecological Society of America, Milwaukee, WI, August 2008.
- “Modeling and analyzing the use, efficiency, value, and governance of water in the Great Lakes region through an integrated approach: 2009 Update,” International Association of Great Lakes Research, Toledo, Ohio, May, 2009. *invited*.
- “Spatial variability of constraints on groundwater usage due to potential adverse resource impacts in the Great Lakes Basin.” National Groundwater Association 2010 Ground Water Summit, Denver, CO, April 2010. (presented by student).
- “Modeling and analyzing the use, efficiency, value, and governance of water in the Great Lakes region through an integrated approach: 2010 Update,” International Association of Great Lakes Research, Toronto, Canada, May, 2010. *invited*.
- “Estimation of Vertical Groundwater Fluxes into a Streambed through Continuous Temperature Profile Monitoring and the Relationship of Groundwater Fluxes to Coaster Brook Trout Spawning Habitat,” American Geophysical Union, San Francisco, CA, December 2010 (presented by student).
- “Assessing the spatial variability of constraints on groundwater abstractions due to potential adverse resource impacts on surface water ecosystems - a GIS based approach, American Geophysical Union, San Francisco, December 2010 (presented by student).
- “Can hydrologic models change water-related risk perceptions? Results of a participatory modeling workshop in the Sonora River Basin, Mexico,” American Geophysical Union, December 2010 (presented by student).
- “Spatial Streamflow Forecasting in a Large River Basin in Northwestern Mexico using a Fully-distributed Hydrologic Model,” American Geophysical Union, San Francisco, California, December 2010 (presented by student).
- “Distributed streamflow predictions based on precipitation data from sparse ground networks and the North American Land Data Assimilation System in Northwest Mexico,” American Meteorological Society Annual Meeting, Seattle, Washington, January 2011 (presented by student).
- “Forecasting Future Phosphorus Loading in the Great Lakes Region from Changing Land-Derived Nutrient Inputs,” International Association of Great Lakes Research, International Association of Great Lakes Research, Duluth, MN, May 2011 (presented by student).
- “Modeling Bioenhanced DNAPL Dissolution in 1-D and 2-D Flow systems,” American Geophysical Union, San Francisco, CA, December 2011 (presented by student).
- “Integrated Water and Sanitation Risk Assessment and Modeling in the Upper Sonora River Basin, Mexico, American Geophysical Union, San Francisco, CA, December 2011 (presented by student).
- “Estimating multi-scalar ecosystem impacts and socioeconomic value benefits of freshwater withdrawals using Water Footprinting,” American Geophysical Union, San Francisco, CA, December 2011 (presented by co-author).
- “Links between Spatially-Explicit Runoff Mechanisms and Land-Atmosphere Interactions during the North American Monsoon,” American Geophysical Union, San Francisco, CA, December 2011 (presented by co-author).
- “Determination of Water Stress Indices as a Function of Ecological Flows,” American Society of Civil Engineers Environmental and Water Resources Institute, Albuquerque, NM, May 2012.
- “Forecasting future phosphorus export to the Laurentian Great Lakes from land-derived nutrient inputs,” American Geophysical Union, San Francisco, CA, December 2011 (presented by student).
- “Groundwater availability under hydrogeologic and ecological constraints: A regional assessment for the Great Lakes Basin,” American Geophysical Union, San Francisco, CA, December 2011 (presented by student).
- “Global Water Workshop,” Ford Motor Company, invited panelist, May 2013.
- “Modeling bioenhanced DNAPL dissolution: Competition and hydrodynamic effects,” Second International Symposium on Bioremediation and Sustainable Environmental Technologies, Battelle Memorial Institute, Jacksonville, FL, June 2013 (presented by co-author).

- “Participatory Modeling and Collaborative Water Resources Decision-Making in the Rio Sonora Basin, Mexico,” American Geophysical Union, San Francisco, CA, December 2013.
- “Linking economic water use, freshwater ecosystem impacts, and virtual water trade in a Great Lakes watershed,” American Geophysical Union, San Francisco, CA, December 2013.
- “Participant Impacts from a Participatory Modeling Workshop in Sonora, Mexico,” International Symposium on Society and Resource Management, Hanover, Germany, June 2014 (presented by co-author).
- “Emergence of a Food-Energy-Water Nexus in Northwest Mexico as a Result of Interbasin Water Transfers,” Water, Energy and Climate Conference, International Water Association, Mexico City, May 2014.
- “Estimating ecological water stress caused by anthropogenic uses in the US Great Lakes region,” American Geophysical Union, San Francisco, CA, December 2014 (presented co-author).
- “Participatory Water Resources Modeling in a Water-Scarce Basin (Rio Sonora, Mexico) Reveals Uncertainty in Decision-Making,” American Geophysical Union, San Francisco, CA, December 2014.
- “Virtual water flows and Water Balance Impacts of the U.S. Great Lakes Basin,” American Geophysical Union, San Francisco, CA, December 2014 (presented co-author).
- “Weather Stations as Educational and Hazard-Forecasting Tools,” American Geophysical Union, San Francisco, CA, December 2014 (presented by co-author).
- “Smart Phone Application and Web-based Database Tools in Support of Beach Monitoring and Virtual Beach,” American Water Works Association Illinois Annual Conference, Springfield, IL, March 2015.
- “A Multi-National, Multi-Disciplinary, Multi-Platform Course on Rural Sustainability,” 7th Conference on Engineering Education for Sustainable Development, Vancouver, Canada, June 2015.
- “Impacts of Intra-Annual Climate Variability and Change on Phosphorous Loads in the Great Lakes Basin,” American Geophysical Union, San Francisco, CA, December 2015.
- US Billion Ton 2016 Billion-Ton Report - Department of Energy, Washington, DC, May 2016, *invited panelist*.
- “The role of mapping ecosystem responses and tradeoffs in the design and evaluation of payments for ecosystem services programs: Application to payments for ecosystem services programs in Veracruz, Mexico,” 22nd International Symposium on Society and Resource Management, Houghton, MI, June 2016.
- Lake Erie Ecosystem Priority Report, International Joint Commission, Windsor, Canada, July 2016, *invited panelist*.
- “Development of an Innovative Model for the Energy-Water-Food Nexus in Sonora: The Case of the Independencia Aqueduct,” IV Congreso Nacional de Manejo de Cuencas Hidrográficas, Xalapa, Mexico, October 2016.
- “RíoMío – A Citizen Science App for Collecting Visual Information on River Health,” IV Congreso Nacional de Manejo de Cuencas Hidrográficas, Xalapa, Mexico, October 2016.
- “The role of Payments for Environmental Services Water and analysis of the coherence of public policies for sustainable development of river basins as tools to promote sustainable management in the Rio Antigua,” IV Congreso Nacional de Manejo de Cuencas Hidrográficas, Xalapa, Mexico, October 2016, *invited panelist*.
- “Application of Coupled Human-Natural Systems Model for Assessing Trade-Offs Between Watershed Ecosystem Services in Veracruz, Mexico,” IV Congreso Nacional de Manejo de Cuencas Hidrográficas, Xalapa, Mexico, October 2016.
- “Evaluation results of the GlobalWatershed GK-12 Fellowship Program a model for increased science literacy and partnership,” American Geophysical Union, San Francisco, CA, December 2016.
- “Developing the greatest Blue Economy: Water productivity, fresh water depletion, and virtual water trade in the Great Lakes basin,” American Geophysical Union, San Francisco, CA, December 2016.

- “Application of Coupled Human-Natural Systems Model for Assessing Trade-Offs Between Watershed Ecosystem Services in Veracruz, Mexico,” American Geophysical Union, San Francisco, CA, December 2016.
- “Sea level rise and inundation of island interiors: assessing impacts of lake formation and evaporation on water resources in arid climates,” American Geophysical Union, San Francisco, CA, December 2016.
- “Use of participatory modeling workshops in a water-stressed basin of northern Mexico to assess sustainable water resources management and conduct community outreach,” American Geophysical Union, San Francisco, CA, December 2016 (presented by co-author).
- “Assessing the interactions between payment for watershed service programs and coupled human-natural systems in Veracruz, Mexico,” American Association of Geographers Annual Meeting, Boston, MA, March 2017 (presented by co-author).
- “The challenge of optimizing payment for watershed services programs: Modeling socio-hydrologic systems in Veracruz, Mexico,” World Water Congress, Cancun, Mexico, June 2017, *invited panelist*.
- “Developing the Great Lakes’ Blue Economy: Water Productivity, Water Depletion, and Virtual Water Trade in the Great Lakes Basin,” 4th Water Research Conference: The Role of Water Technology Innovation in the Blue Economy, Kitchener, Canada, September 2017, *invited speaker*.
- “Paying for hydrological services: Community voices and perceptions from Sucopo, Yucatan, Mexico,” Congreso Internacional de Servicios Ecosistémicos en los Neotrópicos (CISEN V), Oaxaca, Mexico, November 2017 (presented by co-author).
- “Emergence of a Food-Energy-Water Nexus in Northwest Mexico as a Result of Interbasin Water Transfers,” American Geophysical Union, New Orleans, LA, December 2017 (presented by co-author).
- “Hydrologic Impacts of Developing Forest-based Bioenergy Feedstock in Wisconsin, USA and Entre Rios, Argentina Watersheds,” American Geophysical Union, New Orleans, LA, December 2017 (presented by co-author).
- “Using ESRI Online Mapping Tools to Support STEM Learning through Analysis of the Impact of Land Use/Land Cover Change on Water Quality,” American Geophysical Union, New Orleans, LA, December 2017 (presented by co-author).
- “Hydro-climatic risk in land planning and management,” World Water Forum, Brasilia, Brazil, March 2018, *session organizer*.
- “Financing the ecosystems dynamics,” World Water Forum, Brasilia, Brazil, March 2018, *session organizer*.
- “Payment for watershed services programs: Monitoring & Evaluation Veracruz, Mexico,” World Water Forum, Brasilia, Brazil, March 2018, *invited panelist*.
- “Coupled human-natural systems modeling for assessing and improving payment for watershed service programs in Veracruz, México,” American Association of Geographers Annual Meeting, New Orleans, LA, March 2018.

Invited Lectures:

- “Nonequilibrium Dissolution of Nonaqueous Phase Liquid (NAPL) Contaminants,” Department of Petroleum and Geosystems Engineering, University of Texas, Austin, Texas, January 1997.
- “Apparent Nonequilibrium Dissolution of NAPLs: Explanations and Implications,” Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, March 1997.
- “Coupling Risk and Cost in a Multi-Objective Framework for Optimizing Remediation Design,” Sandia National Laboratory, Albuquerque, New Mexico, June 1997.
- “Rate-Limited Solubilization of Organic Liquid Contaminants: Measurements and Implications,” Department of Earth Sciences, Stanford University, California, October 1998.
- “Surfactant-Enhanced Aquifer Remediation: A Multi-Scale Investigation of Rate Limitations,” University of Colorado, Boulder, Colorado, March 1999.

- “Using Multi-Objective Optimization to Design Subsurface Remediation Systems,” Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, The Netherlands, April 1999.
- “Visualization of Surfactant-Enhanced NAPL Mobilization and Solubilization,” ISVA, Danish Technological University, Lyngby, Denmark, April 1999.
- “Applications of Saltwater Intrusion Modeling to the Guaymas Valley Aquifer, Sonora, Mexico: Four-Day Workshop,” University of Sonora, Sonora, Mexico, October, 1999.
- “Surfactant-Enhanced Aquifer Remediation,” Mexican Institute for Water Technology, Cuernavaca, Mexico, May 2000.
- “Multiobjective Optimization for Groundwater Remediation,” Mexican Institute for Water Technology, Cuernavaca, Mexico, May 2000.
- “Groundwater Remediation and Risk Assessment” Tampere University, Finland, December 2000.
- “Optimization Methods for Groundwater and Soil Remediation,” Tampere University, Finland, December 2000.
- “Multi-Scale Nonequilibrium in Surfactant Enhanced Aquifer Remediation” University of Vermont, January 2001.
- “Chemical and Physical Nonequilibrium in Groundwater Remediation with Surfactants,” Leuven University, Belgium, February 2001.
- “Surfactant-Enhanced Aquifer Remediation-Kinetic Effects,” University of Padua, Italy, March 2002.
- “Broad survey of water problems and approaches for solving problems in Sonora,” Instituto Mexicano de Tecnología del Agua, Morelos, Mexico, August 2002.
- “A Challenging Optimization Problem: Engineering Design of Subsurface Environmental Remediation Systems,” Statistical and Applied Mathematical Sciences Institute, Research Triangle Park, North Carolina, March 2003.
- “US Perspectives on Watershed Management,” Watershed Management Certificate Lecture Series, College of Sonora, Mexico, October 2006.
- “Crecimiento de Ciudades: la Población, el Agua y su Infraestructura,” North American Mobility Program Conference, Guanajuato, Mexico, October 2006.
- “US Perspectives on Watershed Management,” Watershed Management Certificate Lecture Series, College of Sonora, Mexico, April 2007.
- “Integrated Economic-Environmental-Hydrologic Modeling of the Rio Yaqui Basin, Sonora, Mexico,” University of Illinois, May 2007.
- “US Perspectives on Watershed Management,” Watershed Management Certificate Lecture Series, College of Sonora, Mexico, October 2007.
- “Estimation of streambed groundwater fluxes associated with coaster brook trout spawning habitat,” El Colegio de la Frontera Sur, Grupo Conservación y Restauración de Bosques, San Cristobal, Mexico, July 2011.
- “Freshwater Ecosystem Services in the Laurentian Great Lakes,” Indo-US Bilateral Workshop on Global Challenges: Climate Change, Water, Environment and Society Indo-US Science and Technology Forum, Gurgaon, India, March 2012.
- “Nonaqueous Phase Liquid Migration and Distribution,” LNAPL Workshop, American Institute of Professional Geologists, June 2012.
- “Exploration of the hydrogeology of the Mission Creek Fault: Faulting as a barrier to groundwater flow, Palms to Pines Field Trip, South Coast Geological Survey, Santa Ana, California, October 2012.
- “Development of water resources management strategies in a water-scarce, water-conflicted basin through participatory modeling,” University of Texas El Paso, December 2013.
- “Forecasting future phosphorus export to the Laurentian Great Lakes from land-derived nutrient inputs,” Arizona State University, March 2014.
- “Phosphorous contributions to cultural eutrophication in the Great Lakes: Impacts of land use and climate change,” Institute of Ecology, Xalapa, Mexico, October 2014.

- “Impacts of Spatial Variations in Land Use and Intra-Annual Climate Variability and Corresponding Changes in Land Use and Climate on Phosphorus Loads in the Great Lakes Basin,” University of Texas El Paso, August 2015.
- “Development of water resources management strategies in a water-scarce, water-conflicted basin through participatory modeling,” University of New Hampshire, September 2015.
- “Virtual water flows and their connections to streamflow depletions: Estimates for the Great Lakes basin are based on relationships between county-level trade and water consumption sectors,” University of Indiana, November 2015.
- “Developing the Great Lakes’ Blue Economy: Water Productivity, Water Depletion, and Virtual Water Trade in the Great Lakes Basin,” University of Waterloo, Canada, February 2017.
- “Why choose bottled water? Unraveling how we think about what we drink,” University of Michigan-Flint, October 2017.
- “How do we best manage return flows?” Efficiency-oriented water management - From panaceas to actual solutions Workshop, Centro Euro-Mediterraneo sui Cambiamenti Climatici, Venics Italy, October 2017.

Research Projects

Total Funding, 1993-present

Federal or State Sources: as PI, \$11,410,000; as co-PI, \$9,126,000

Other Sources: as PI, \$1,314,000; as co-PI, \$204,000

Current Funded Projects

- Efficient Surrogate Modeling for Sustainable Management of Complex Seawater Intrusion-Impacted Aquifers, PI, National Science Foundation, \$319,950 9/19 to 8/22.
- IRES Track III: Collaborative Research: Coupling Participatory and Hydrological Research for Adapting to Extreme Hydrometeorological Events in Agricultural Communities, El Salvador, co-PI, National Science Foundation, \$881,974, 5/19 to 4/22.
- How Does Groundwater Inundation of Carbonate Island Interiors from Sea Level Rise Impact Surface Water-Aquifer Interactions and Evaporative Losses? PI, National Science Foundation, \$254,330, 3/19 to 2/20.
- RET: PLACE – Promoting Learning about Computational Tools and the Environment, PI, National Science Foundation, \$600,000, 1/16 to 12/19.
- Sustainable Water Resources for Irrigated Agriculture in a Desert River Basin Facing Climate Change and Competing Demands: From Characterization to Solutions, co-PI, US Department of Agriculture, \$5,000,000 (MTU portion \$500,000). 4/15 to 3/19.

Selected, Past Funded Projects

- The Role of Citizen Science in Watershed Hydrology Research: Relationships between Volunteer Motivations, Data Quantity and Quality, and Decision-Making, PI, National Science Foundation, \$100,000, 1/17 to 12/18.
- Experimental Frameworks for Evaluating the Net Effects of Hydrological Service Payments on Coupled Social-Ecological Systems in Mexico, PI, National Science Foundation, \$1,475,000, 1/14 to 12/18.
- Sustainability, Ecosystem Services, and Bioenergy Development across the Americas, Senior Personnel, National Science Foundation, \$5,043,000, 9/12 to 8/18.
- A Research Coordination Network on Pan American Biofuels and Bioenergy Sustainability, Senior Personnel and Steering Committee Member, National Science Foundation, \$750,000, 1/12 to 12/16.

- Sustainable Water Resources for Communities under Climate Change: Can State-of-the-Art Forecasting Inform Decision-Making in Data Sparse Regions?, PI, National Science Foundation, \$324,000, 9/10 to 8/16.
- GK12: GlobalWatershed: Integrating Rural and Global Perspectives with Research and Technological Advances, PI, National Science Foundation, \$2,500,000, 9/09 to 8/16.
- Reducing Copper Loads from Stamp Sand Deposits in the Keweenaw Peninsula with Permeable Reactive Barriers, PI, Michigan Department of Environmental Quality, \$149,000, 8/14 to 7/16.
- Emergence of a Food-Water-Energy Nexus Due to an Inter-Basin Transfer in a Context of a Highly Variable Climate, PI, National Science Foundation, \$64,000, 7/15 to 8/16.
- Environmental CyberCitizens: Engaging Citizen Scientists in Global Environmental Change through Crowdsensing and Visualization, PI, National Science Foundation, \$250,000, 9/11 to 8/15.
- Virtual Water Accounting: A New Paradigm for the Adaptive Management of Great Lakes Water, PI, Great Lakes Protection Fund, \$400,000, 1/11 to 4/15.
- SustR: Sustainable Development for Rural Communities- Social, Health, Economic, and Environmental Advances, PI, US Department of Education, \$180,000, 09/08 to 08/13.
- Modeling and Analyzing the Use, Efficiency, Value and Governance of Water as a Material in the Great Lakes Region through an Integrated Approach, PI, National Science Foundation, \$1,078,000, 09/07 to 08/13.
- Humans, Hydrology, Climate Change, and Ecosystems- An Integrated Analysis of Water Resources and Ecosystem Services in the Great Lakes Basin (Planning Grant), PI, National Science Foundation, \$150,000, 9/10 to 9/12.
- Enhancing the Capacity for Sustainable Forest Management and Ecosystem Service Provisioning in Chiapas and Oaxaca, PI, US Agency for International Development, \$290,000, 09/08 to 08/11.
- Biocomplexity of Hydrological Service Payments and Watershed Sustainability in Mexico (planning grant), co-PI, NSF, \$38,500, 9/09 to 9/12.
- Graduate Student Scholarships to Advance a Global Outlook of Economic and Social Prosperity that Protects the Environment, acting PI, National Science Foundation, Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) \$600,000, 6/08 to 5/12.
- Sustainable Wastewater Management in the Rio Sonora Basin, Mexico, PI, Consejo Nacional de Ciencia y Tecnologia (Mexico), \$80,000, 01/04 to 12/10.
- Biocomplexity of Hydrological Service Payments and Watershed Sustainability in Mexico (Planning Grant), co-PI, National Science Foundation, \$38,500, 9/09 to 8/10.
- ExCit: Expanding Cities- People, Water and Infrastructure, PI, US Department of Education, \$228,000, 08/03 to 07/08.
- Watershed Management Plan for Huron Creek Watershed, PI, Michigan Department of Environmental Quality, \$74,000, 09/07 to 06/09.
- Engaging Social Scientists in the WATERS Initiative: Special Sessions at the 2008 International Symposium on Society and Resource Management, PI, National Science Foundation, \$18,000, 05/08 to 04/09.
- Center for Water and Society, PI, MTU, \$45,000, 09/05 to 08/06
- Vietnam: Water Resources Management Planning Grant, PI, National Science Foundation, \$2,000, 03/05 to 09/05.
- Michigan Tech-UNISON Linkage: Training a Core of Water Resources Experts, PI, U.S. Agency for International Development, \$787,000, 03/03 to 08/06.
- Multi-Objective Decision-Making for Environmental Remediation, PI, Environmental Protection Agency, \$292,000, 09/98 to 05/03.
- AQUA3: North American Alliance for Sustainable Water Resources Management, PI, Department of Education, \$214,000, 03/01 to 02/05.
- Ph.D. Fellowships in Computational Engineering and Sciences, PI, Department of Education, \$453,000, 03/01 to 02/04.

Computational Facilities for MTU's CS&E Program, co-PI, National Science Foundation, \$260,000, 09/98 to 08/01.

Metrics for Optimization of Environmental Remediation Problems, PI, National Science Foundation, \$111,000, 06/01 to 05/03.

Multi-Scale Investigation of Mass Transfer Limitations in Surfactant-Enhanced Aquifer Remediation, PI, Environmental Protection Agency, \$474,000, 11/96 to 10/01.

A Mathematical Modeling Approach to Determine the Advance of Saline Intrusion in the Guaymas Valley, Sonora, Mexico, co-PI, Consejo Nacional de Ciencia y Tecnologia (Mexico), \$38,000, 05/97 to 12/99.

Monitoring and Assessment of Northern Hardwoods Groundwater Remediation Efforts, Mead Paper Company, PI, Mead Paper, \$84,000, 05/96 to 08/00.

Capillary Desaturation of Nonaqueous Phase Liquids in Porous Media, PI, Michigan Research Excellence Fund, \$32,000, 12/97 to 12/98.

In Situ Subsurface Remediation Technologies: Integration into an Interdisciplinary Engineering Curriculum, co-PI, National Science Foundation, \$465,000, 09/94 to 09/98.

Mechanistic Relationships for Physical Nonequilibrium Phenomena in Vadose Zone Solute Transport, PI, National Science Foundation, \$142,000, 09/93 to 01/97.

Environmental Treatment Design Options Tool (ETDOT), co-PI, MTU/EPA Center of Excellence, \$184,000, 04/93 to 06/96.

Environmental Fate and Risk Assessment Tool (EFRAT), co-PI, MTU/EPA Center of Excellence, \$126,000, 04/95 to 06/96.

In Situ Containment of Heavy Metals in Soils and Groundwater through Chemical Precipitation, co-PI, Michigan Research Excellence Fund, \$36,000, 12/94 to 03/96.

A Pore-Scale Investigation of Immiscible Fluid Displacement at Porous Media Interfaces (Travel Grant), PI, National Academy of Science/National Research Council, \$2,000, 12/94 to 11/95.

Enhanced Visualization for Analysis of Groundwater Modeling Efforts, co-PI, Michigan Research Excellence Fund, \$130,000, 11/92 to 10/94.

Application of Domain Decomposition and Parallelization Techniques for a Multiphase Flow and Transport Model, PI, Cray Research Corporation, \$170,000, 09/93 to 04/94.

Characterization of a Large Fault Zone as a Barrier to Fluid Flow: The San Andreas Fault near Desert Hot Springs, CA, PI, Petroleum Research Fund, \$29,000, 09/94 to 08/97.

Service

Recent University Service, 2005-present

2005-2009	GMES Departmental Graduate Committee, <i>Chair</i>
2005-2011	<i>Director</i> and co-founder, Michigan Technological University Center for Water & Society
2005-6	Search Committee for SFRES Faculty
2005-present	Curriculum Committees (BS Geological Engineering, BS Geoenvironmental Engineering (<i>Co-Chair</i>), BS in Engineering, PhD in Environmental Engineering (<i>Chair</i>), PhD in Computational Science
2006	Committee to Evaluate SFRES Dean
2006-2008	College of Engineering Promotion & Tenure Committee
2006-7	Search Committee for College of Engineering Dean, <i>Chair</i>
2007	Research Misconduct Investigation Committee, <i>Chair</i>
2007	Search Committee for SFRES Faculty
2007	Presidential Task Force on Commitment to Internationalize Education, Research, and Service
2009-2010	Search Committee for Provost and Academic Vice President, <i>Chair</i>

2010-2013 CEE Departmental Promotion, Tenure and Policy Committee
2011-2013 Strategic Faculty Hiring Initiative in Water, *Chair*
2013-present University Learning Goal Committee
2016-2017 Search Committee for CEE Department Chair, *Co-Chair*
2017 Search Committee for SFRES Faculty
2017-present CEE Department Awards Committee
2017-present College of Engineering Awards Committee
2018-present Inter-Departmental PhD in Environmental Engineering Committee, *Chair*

Editing

Advances in Water Resources: Member, Editorial Board 1997-2005
Journal of Contaminant Hydrology: Member, Editorial Board 1999-2005
Water Resources Research: Associate Editor 1999-2003

Current Membership in Professional Organizations

American Geophysical Union
American Society of Civil Engineers
American Water Works Association
National Ground Water Association

Manuscript, Proposal, and Panel Reviews

Advances in Water Resources, Outstanding Reviewer 2014
American Society of Civil Engineering (ASCE) Books
Biotechnology Progress
Environmental Science: Processes & Impacts
Environmental Science & Technology
European Journal for Operations Research
Geoscience Data Journal
Ground Water
Ground Water Monitoring & Remediation
HESS
Journal of Colloid and Interface Science
Journal of Contaminant Hydrology
Journal of Environmental Engineering, ASCE
Journal of Hydraulic Engineering, ASCE
Journal of Hydrogeology
Journal of Hydrologic Engineering, ASCE
Journal of Hydrology
Journal of Water Resources Planning & Management, ASCE
Soil Science Society of America Journal
Soil Science Society of America Books
Water Alternatives
Water Resources Research

Alabama Agricultural Experiment Station
Canadian Universities Community Development
Fulbright Scholar Program

National Science Foundation (IGERT, Environmental Engineering, Hydrology, GK-12, Environmental Sustainability, S-STEM, GK-12, CAREER)
 National Research Council/U.S.-Mexico Foundation for Science
 Petroleum Research Fund
 U.S. Army Research Office
 U.S. Department of Defense EPSCoR
 U.S. Department of Energy EMS, Billion Ton Report 2016
 U.S. Geological Survey

Teaching, Curriculum Development and Graduate Advising Experience

Courses Taught

Civil Engineering Senior Design (undergraduate)
 Coupled Human and Natural Systems Seminar (graduate)
 Drinking Water Treatment (undergraduate)
 Earth Mechanics (undergraduate)
 Environmental Engineering Senior Design (undergraduate)
 Flow and Transport in Porous Media (graduate)
 Geological Engineering Senior Design (undergraduate)
 Groundwater Site Investigations (undergraduate)
 Hydrogeology/Geohydrology (undergraduate)
 Introduction to Environmental Engineering (undergraduate)
 Mathematical Modeling of Earth Systems (graduate)
 North American Rural Sustainability Field Experience (undergraduate/graduate)
 North American Water Resources Field Experience (undergraduate/graduate)
 Remediation Engineering (undergraduate/graduate)
 Rural Sustainability Seminar (undergraduate/graduate)
 Water & Society (undergraduate/graduate)

Graduate Students Advised (31 MS, 15 PhD)

MS Student- Principal Advisor

Vaughn Wildfong, "A Comprehensive Model to Predict Fate of Volatile Organic Compounds in a Wastewater Treatment Facility," Environmental Engineering, 1994
 Richard Voigt, "Modeling Metals Fate in Conventional Wastewater Treatment Plants," Environmental Engineering, 1995
 Michael Breidenbach, "Development of a Laboratory Column for Investigating Solute Transport in the Vadose Zone," Civil Engineering, 1996,
 Todd Sandman, "An Experimental Study of Relationships between Transport Parameters and Flow Conditions for Transient and Steady-State Flows in an Unsaturated Sand," Civil Engineering, 1996
 Darren Dusenbery, "An I-DEAS Based Three-Dimensional Graphical Pre- and Post-Processor for Groundwater Models," Geological Engineering, 1996 (co-advisor)
 Joel Johnson, "A Complete Pre- and Post-Processing Framework for Groundwater Flow and Transport Modeling in Three Dimensions," Civil Engineering, 1995 (co-advisor)
 Wesley May, "Characterization of a Large Fault Zone as a Barrier to Fluid Flow: The San Andreas Fault near Desert Hot Springs, California," Geological Engineering, 1997
 Chad Lukkarila, "Modeling the San Andreas Fault near Desert Hot Springs, California as a Barrier to Groundwater Flow," Geological Engineering, 1998
 Mark Erickson, "Multiobjective Optimization of a Groundwater Quality Management Problem

- Using the Niched Pareto Genetic Algorithm,” Geological Engineering, 2000
- Eileen Ostrowski, “Prediction of Hydraulic Conductivity from Bench-, Meso-, and Full-Scale Experiments,” Environmental Engineering, 2000 (co-advisor)
- Jeff Ahrens, “Creation of Amorphous Ferric Hydroxides with Oxygenated Water for In-Situ Immobilization of Arsenic from Groundwater,” Environmental Engineering, 2003
- Wanda Rodriguez, “Arsenic Removal by Creating an In Situ $\text{Fe}(\text{OH})_3$ Filter: Effects on $\text{Fe}(\text{OH})_3$ Adsorption to Sand Due to Variations in Fe Concentration, Pore Grain Size and Residence Time,” Environmental Engineering, 2005
- Kristen Betz, “Preliminary Study to Determine the Effects of Air Sparging on Source Zone Dense Nonaqueous Phase Liquids Using Mass Flux,” Environmental Engineering, 2006
- Monica Ilija Ojeda, “Economic Valuation of Environmental Services Sustained by Water Flows in the Yaqui River Delta, Mexico,” Environmental Engineering, 2006
- Linda Kersten, “Huron Creek Watershed Management Plan,” Environmental Engineering, 2008
- Matthew Van Grinsven, “Groundwater Fluxes in Coaster Brook Trout Spawning Areas,” Geology, 2011
- Katelyn Fitzgerald, “Groundwater Sustainability in the Great Lakes Basin,” Geological Engineering, 2012
- Ryan Biehl, “A Suitability Comparison of Rainwater Harvesting and Piped Water Systems in the Dominican Republic,” Environmental Engineering Master’s International, 2012
- Steven Wright, “Using Contingent Valuation to Estimate Willingness to Pay for Improved Water Source in Rural Uganda,” Environmental Engineering Master’s International, 2013
- Selene Gonzalez, “Soil Erosion Rates and Community Understanding of Soil Erosion in Rural Communities in Chiapas, Mexico,” 2013
- Rebecca Midkiff, “A Cultural and Technical Study of Wastewater Treatment Plant Maintenance in a Small Community in Peru,” Environmental Engineering Master’s International, 2016
- Chris Walkons, “Designing A Permeable Reactive Barrier for the Remediation of Copper Contaminated Groundwater,” Environmental Engineering, 2017
- Yogesh Shejal, Environmental Engineering Coursework MS, expected graduation 2018
- Jaya Shirke, Environmental Engineering Coursework MS, expected graduation 2018
- Prakirti Valiveti, Environmental Engineering Coursework MS, expected graduation 2018
- Marina Samp, Environmental Engineering Coursework MS, expected graduation 2018
- Nicole Wehner, Environmental Engineering Coursework MS, expected graduation 2018 (co-advisor)
- Kiran Udayakumar, Environmental Engineering Coursework MS, expected graduation 2018
- Marjan Monfarednasab, Environmental Engineering, expected graduation 2019
- Jessica Alger, Environmental Engineering, expected graduation 2019
- Vaishnavi Narayanan, Environmental Engineering Coursework MS, expected graduation 2019

PhD Students- Principal Advisor

- Robert Mitchell, “Nonideal Flow and Solute Transport in Unsaturated Porous Media: A Modeling Study,” Environmental Engineering, 1996
- Changlin Huang, “Improving the Performance of Pump-and-Treat Groundwater Remediation Using Mathematical Optimization,” Environmental Engineering, 1996
- John Uhrie, “Immobilization of Sulfide Metals in Porous Media,” Metallurgy, 1998 (co-advisor)
- Lirong Zhong, “Surfactant-Enhanced Nonaqueous Phase Liquid Contaminant Removal from Liquid Saturated Media,” Environmental Engineering, 1999
- Karen Endres, “Optimization of Complex Groundwater Remediation Systems,” Environmental Engineering, 2004
- Domenico Bau, “Stochastic analysis for optimal management strategies applied to the remediation of contaminated groundwater/aquifer systems,” Environmental Engineering,

2006
Andrea Munoz Hernandez, “Integrated Modeling of Water Resources in the Rio Yaqui Basin,”
Environmental Engineering, 2009
Agustin Robles Morua, “Sustainable Wastewater Management in the Rio Sonora Basin, Mexico,”
Environmental Engineering, 2010
Meredith Ballard, “Phosphorus Loading in the Great Lakes Basin: Effects of Future Land Use
and Climate Change and Monitoring Programs,” Environmental Engineering, 2013
Sara Alian, “Characterization of Ecological Water Stress in the U.S. Great Lakes Region Using a
Geospatial Modeling Approach,” Forest Science, 2017 (co-advisor)
Azad Heidari, Civil Engineering, expected graduation 2018 (co-advisor)
Hossein Tavikoli Environmental Engineering, expected graduation 2018 (co-advisor)
Ken Thiemann, Environmental Engineering, expected graduation 2019
Sergio Lopez Ramirez, Civil Engineering, expected graduation 2019
Lauren Manciewicz, Environmental Engineering, expected graduation 2020

MS Students- Committee Member: 120 students in 16 degree programs

PhD Students- Committee Member: 32 students in 8 degree programs