

**JAMES E. SAIERS**  
**CURRICULUM VITAE**

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**COLLEGE AND GRADUATE EDUCATION**

1991 – 1995 Ph.D., Environmental Sciences, University of Virginia

1989 – 1991 M.S., Environmental Sciences, University of Virginia

1985 – 1989 B.S., Geology, Indiana University of Pennsylvania, *Summa Cum Laude*

**SUMMARY OF PROFESSIONAL CAREER**

2015 - Clifton R. Musser Professor of Hydrology (primary appointment), School of the Environment, Yale University

2016 Interim Dean, Yale School of Forestry and Environmental Studies

2014 - Professor, Department of Geology and Geophysics, Yale University

2009 - 2016 Associate Dean of Academic Affairs, School of Forestry and Environmental Studies, Yale University.

2005 - 2015 Professor of Hydrology (primary appointment), School of Forestry and Environmental Studies, Yale University

2005 - Professor, Department of Chemical Engineering, Yale University

2001 - 2004 Associate Professor of Hydrology (primary appointment), School of Forestry and Environmental Studies, Yale University

2001 - 2004 Associate Professor, Department of Chemical Engineering, Yale University

2002 Associate Research Scientist, Department of Environmental Sciences, University of Virginia

1999 - 2001 Assistant Professor of Hydrology (primary appointment), School of Forestry and Environmental Studies, Yale University

1999 - 2001 Assistant Professor, Department of Chemical Engineering, Yale University

1995 – 1999 Assistant Professor of Hydrology, Department of Geology, Florida International University

## **EDITORSHIPS**

2007 - 2010 Associate Editor, *Water Resources Research*

2006 Guest Associate Editor for Special Section on Colloid Transport in Subsurface Environments, *Water Resources Research*

2004 - 2006 Hydrology/Biogeosciences Editor, *Geophysical Research Letters*

2000 - 2004 Associate Editor, *Water Resources Research*

## **HONORS AND RECOGNITION**

1996 Junior Faculty Enhancement Award, Oak Ridge Associated Universities

1994 Maury Award, Department of Environmental Sciences, University of Virginia

1993 Dupont Fellowship, Department of Environmental Sciences, University of Virginia

1991 – 1994 Environmental Restoration Fellowship, Oak Ridge Associated Universities

1990 Pegau Award, Department of Environmental Sciences, University of Virginia

## **PROFESSIONAL AFFILIATIONS**

American Geophysical Union

American Chemical Society

Geological Society of America

National Groundwater Association

## **RESEARCH OVERVIEW**

I study the movement of water and waterborne constituents on and below the earth's surface. This research relies on laboratory-scale and field-scale experimentation and focuses on systems governed by coupled hydrological and geochemical processes. I use data collected from these experiments to test and refine mathematical models that quantify fluid flow, mass transport, and chemical reactions. My overarching goal is to generate new experimental observations and to develop predictive approaches that can be used to inform water-resource management decisions and to guide restoration plans for sites impacted by polluted groundwater or surface water.

## RESEARCH PUBLICATIONS

### Refereed Articles

- Li, Yunpo. N.A. Thelemague, H.G. Siegel, C.J. Clark, E. Ryan, R.J. Brenneis, K.M. Gutchess, M.A. Soriano, B. Xiong, N.C. Deziel, J.E. Saiers, D.L. Plata. In review. Groundwater methane in northeastern Pennsylvania attributable to thermogenic sources and hydrogeomorphologic migration pathways. Submitted to *Proceedings of the National Academy of Sciences*.
- Saiers, J.E., J.H. Fair, J.B. Shanley, J. Hosen, S. Matt, K. Ryan, P.A. Raymond. In review. Evaluating streamwater DOC dynamics in context of variable flowpath contributions with a tracer-based mixing model. Submitted to *Water Resources Research*.
- Clark, C.J., B. Xiong, M. A. Soriano, Jr., K. Gutchess, H. Siegel, E. C. Ryan, N. P. Johnson, K. Cassell, E. G. Elliott, Y. Li, A.J. Cox, N. Bugher, L. Glist, R. J. Brenneis, K. M. Sorrentino, J. Plano, X. Ma, J. L. Warren, D. L. Plata, J. E. Saiers, and N. C. Deziel. In review. Assessing unconventional oil and gas exposure in the Appalachian Basin: Comparison of exposure surrogates and residential drinking water measurements. Submitted to *Environmental Health Perspectives*.
- Xiong, B., M.A. Soriano Jr., K.M. Gutchess, N. Hoffman, C.J. Clark, H.G. Siegel, G.A. De Vera, R. J. Brenneis, A.J. Cox, E.C. Ryan, A.J. Sumner, N.C. Deziel, J.E. Saiers, D.L. Plata. In review. Low organic chemical occurrence in groundwaters near hydraulic fracturing activities associated with limited groundwater derived transport in northeastern Pennsylvania. Submitted to *Environmental Science: Processes and Impacts*.
- \*Soriano, M.A., H.G. Siegel, N.P. Johnson, K.M. Gutchess, B. Xiong, Y. Li, C.J. Clark, D.L. Plata, N.C. Deziel and J.E. Saiers. 2021. Characterizing groundwater well vulnerability to contamination through physics-informed machine learning. Submitted to *Environmental Research Letters*, in press.
- Hagstron, A, L., P. Anastas, A. Boissevain, A. Borrel, N.C. Deziel, S.E. Fenton, C. Fields, J. Fortner, N. Franceschi-Hofmann, R. Frigon, G. Ginsberg, L. Jin, J.-H. Kim, N Kleinstreuer, J. Koelmel, Y. Lei, Z. Liew, X. Ma, L. Mathieu, S. Nason, K. Organtini, Y. Oulhote, S. Pociu, K. Pollitt, J. Saiers, D. Thompson, B. Toal, E. Weiner, S. Whirledge, Y. Zhang, V. Vasiliou 2021. An overview of the challenges and opportunities associated with per- and polyfluoroalkyl substances (PFAS). *Science of the Total Environment*, in press.
- Clark, C.J., J. L. Warren, N. Kadan-Lottick, X. Ma, M. L. Bell J. E. Saiers, N. C. Deziel. 2021. Socio-economic and demographic predictors of oil and gas complaints and determinations in Pennsylvania. *Energy Research and Social Science*, in press.
- Yoon, B. J. Hosen, E. Kyzivat, J. Fair, L. Weber, K. Aho, R. Lowenthal, W. Sobczak, B. Poulin, J. Shanley, J. Morrison, J. Saiers, A. Stubbins, P. Raymond. 2021. Export of photolabile and

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\* Graduate student or postdoctoral advisee

photoprimable dissolved organic matter from the Connecticut River. *Aquatic Sciences*, <https://doi.org/10.1007/s00027-021-00778-8>.

- \*Soriano, M.A., H.G. Siegel, K.M. Gutchess, C.J. Clark, Y. Li, B. Xiong, D.L. Plata, N.C. Deziel, J.E. Saiers. 2020. Evaluating domestic well vulnerability to contamination from oil and gas development sites. *Water Resources Research*, 56, e2020WR028005
- Wagner, S., J. Hoyle-Fair, S. Matt, J. Hosen, P. Raymond, J. Saiers, J. Shanley, T. Dittmar, and A. Stubbins. 2019. Molecular hysteresis: Hydrologically driven changes in riverine dissolved organic matter chemistry during a storm event. *Journal of Geophysical Research: Biogeosciences*, doi: 10.1029/2018JG004817.
- Hosen, J.D., K.S. Aho, A.P. Appling, J.H. Fair, R.O. Hall, E. Kyzivat, S. Matt, J. Morrison, J.E. Saiers, J.B. Shanley, L. Weber, B. Yoon, P.A. Raymond. 2019. Enhancement of primary production by low turbidity during drought in the Connecticut River watershed is scale-dependent. *Limnology and Oceanography*, doi: 10.1002/lno.11127
- \*Zarnetske, J. P., M. Bouda, B.W. Abbott, J.E. Saiers, and P.A. Raymond. 2018. Hydrologic connectivity controls organic carbon flux in 80% of U.S. watersheds. *Geophysical Research Letters*, doi: 10.1029/2018GL080005.
- \*Bouda, M., Brodersen, C. and J.E. Saiers. 2018. Whole root system water conductance responds to both axial and radial traits and network topology over natural range of trait variation. *Journal of Theoretical Biology*, 456:49-61, doi: 10.1016/j.jtbi.2018.07.033
- \*Barth-Naftilan, E., J. Sohng, and J.E. Saiers. 2018. Methane in groundwater before, during, and after hydraulic fracturing of the Marcellus Shale. *Proceedings of National Academy of Sciences*, <https://doi.org/10.1073/pnas.1720898115>
- Piotrowski, P.K., B.A. Weggler, D. Yoxtheimer, E. Barth-Naftilan, J.E. Saiers, and F.L Dorman. 2018. Elucidating environmental fingerprinting mechanisms of unconventional gas development through hydrocarbon analysis. *Analytical Chemistry*, 90 (8), pp 5466–5473, doi: 10.1021/acs.analchem.8b00822
- Entrekin, S., A. Trainor, J.E. Saiers, L. Patterson, K. Maloney, J. Fargione, J. Kiesecker, S. Baruch-Mordo, J.P. Nicot, K. Konschnik, H. Wiseman, J. Ryan. 2018. Water stress from high volume hydraulic fracturing threatens aquatic biodiversity and ecosystem services in Arkansas, U.S.A. *Environmental Science and Technology*, doi: 10.1021/acs.est.7b03304
- Piotrowski, P.K., B.A. Weggler, E. Barth-Naftilan, C.N. Kelly, R. Zimmerman, J.E. Saiers, and F.L Dorman. 2017. Non-targeted chemical characterization of a Marcellus shale gas well through GC×GC with scripting algorithms and high-resolution time-of-flight mass spectrometry. *Fuel*, 215: 363-369, <https://doi.org/10.1016/j.fuel.2017.11.026>.

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\* Graduate student or postdoctoral advisee

- \*Bouda, M. and J.E. Saiers. 2017. Process-based 1D model of root water uptake accurately represents dynamic effects of root system architecture. *Advances in Water Resources*, 110, 319-334, <http://dx.doi.org/10.1016/j.advwatres.2017.10.018>.
- \*Aloysius, N. and J.E. Saiers. 2017. Simulated hydrologic response to projected changes in precipitation and temperature in the Congo River Basin. *Hydrology and Earth System Sciences*, 21, 41156-4130, <https://doi.org/10.5194/hess-21-4115-2017>.
- Patterson, L., K Konschnik, H. Wiseman, J. Fargione, K. Maloney, J. Kiesecker, J-P. Nicot, Jean-S. Baruch-Mordo, S. Entekin, A. Trainor, J. Ryan, J. Saiers. 2017. Unconventional oil and gas spills: risks, mitigation priorities and state reporting requirements. *Environmental Science and Technology*. 51 (5), 2563–2573.
- Maloney, K., S. Baruch-Mordo, L.A. Patterson, J.P. Nicot, S. Entekin, J. Fargione, J. Kiesecker, K. Konschnik, J.N. Ryan, A. Trainor, J. E. Saiers, H. Wiseman. 2017. Unconventional oil and gas spills: materials, volumes and risks to surface waters in four states of the U.S. *Science of the Total Environment*, 581-582: 369-377, <http://dx.doi.org/10.1016/j.scitotenv.2016.12.142>.
- \*Bouda, M., J.S. Caplan, and J.E. Saiers. 2016. Box-counting dimension revisited: assessing self-similarity and an efficient method of reducing quantisation error. *Frontiers in Plant Science*, <http://dx.doi.org/10.3389/fpls.2016.00149>.
- Mohanty, S. K., J.E. Saiers, and J.N. Ryan. 2016. Colloid mobilization in a fractured soil: Effect of pore water exchange between preferential flow paths and soil matrix. *Environmental Science and Technology* 50 (5), pp 2310–2317, DOI: 10.1021/acs.est.5b04767.
- \*Wilson, H.F., P.A. Raymond, J.E. Saiers, W.V. Sobczak, and N. Xu. 2016. Export of more humic and bioavailable dissolved organic matter from a forested New England headwater stream with increasing discharge. *Marine and Freshwater Research*, <http://dx.doi.org/10.1071/MF15286>.
- Raymond, P., J.E. Saiers, and W.V. Sobczak. 2016. Hydrological and biogeochemical controls on watershed dissolved organic matter transport: Pulse-shunt concept. *Ecology*, 97, 5-16, doi: 10.1890/14-1684.1
- \*Aloysius, N. R. J.S. Sheffield, J.E. Saiers, H. Li, and E.F. Wood. 2016. Evaluation of historical and future simulations of precipitation and temperature in Central Africa from CMIP5 Climate Models. *Journal of Geophysical Research – Atmospheres*, 121, 130-152, doi: 10.1002/2015JD023656.
- \*Cheng, T. and J. E. Saiers. 2015. Effects of dissolved organic matter on the co-transport of mineral colloids and sorptive contaminants. *Journal of Contaminant Hydrology*, doi:10.1016/j.jconhyd.2015.04.005.

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\* Graduate student or postdoctoral advisee

- Mohanty, S. K., J.E. Saiers, and J.N. Ryan. 2015. Colloid mobilization in a fractured soil during dry-wet cycles: Role of drying duration and flow path permeability. *Environmental Science and Technology*, 49, 9100-9106, DOI: 10.1021/acs.est.5b00889
- \*Tellman, E. J.E. Saiers, and O.A. Ruiz Cruz. 2015. Quantifying the impacts of land use change on flooding in data poor watersheds in El Salvador with community-based model calibration techniques. *Regional Environmental Change*, DOI 10.1007/s10113-015-0841-y.
- Shih, J-S., J.E. Saiers, S.C. Anisfeld, Z. Chua, L. A. Muehlenbachs, and S.M Olmstead. 2015. Characterization of liquid waste from Marcellus Shale gas development. *Environmental Science and Technology*, DOI 10.1021/acs.est.5b01780
- \*Barth-Naftilan, E.B., N. Aloysius, and J.E. Saiers. 2015. Spatial and temporal trends in freshwater appropriation for natural gas development in Pennsylvania's Marcellus Shale Play. *Geophysical Research Letters*, DOI: 10.1002/2015GL065240.
- Mohanty, S., J. Saiers, and J. Ryan. 2014. Colloid-facilitated mobilization of metals by freeze-thaw cycles. *Environmental Science and Technology*, doi: 10.1021/es403698u.
- \*Yang, Y., J.E. Saiers, and M. Barnett. 2013. Impact of interactions between colloids of natural organic matter and metal oxides on the desorption kinetics of uranium. *Environmental Sciences and Technology*, 47(6):2661-9. doi: 10.1021/es304013r.
- \*Wilson, H.F., J.E. Saiers, P.A. Raymond, W.V. Sobczak, 2013. Hydrologic drivers and seasonality of dissolved organic carbon concentration, nitrogen content, bioavailability, and export in a forested New England stream. *Ecosystems*, doi: 10.1007/s10021-013-9635-6.
- \*Xu, N. H.F. Wilson, J.E. Saiers, 2013. Effects of crop rotation and management system on dissolved organic matter concentration, structure, and bioavailability in a Chernozemic agricultural soil. *Journal of Environmental Quality*, 42, 179-190, doi: 10.2134/jeq2012.0126.
- Khadka, A., C. Fu, M. Myint, C. Oliver, J. Saiers. 2013. Effects of land-cover changes and other remediations on hydrology of Xinjiang river sub-watershed. *Journal of Environmental Science and Engineering. B. 2(7B): 416-225.*
- Saiers, J.E. and E. Barth\*. 2012. Comment on "Potential Contaminant Pathways from Hydraulically Fractured Shale Aquifers" by T. Myers. *Ground Water*. doi: 10.1111/j.1745-6584.2012.00990.x
- \*Yang, Y., J.E. Saiers, N. Xu, S.G Minasian, T. Tylliszczak, S. A, Kozimor, D. Shuh, M. Barnett. 2012. Impact of natural organic matter on uranium transport through saturated geologic materials: From molecular to column scale. *Environmental Science and Technology*, 46: 5931-5938, DOI: 10.1021/es300155j.

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\*Graduate student or postdoctoral advisee.

- Raymond, P., M.B. David, and J. E. Saiers. 2012. The impact of fertilization and hydrology on nitrate fluxes from Mississippi watersheds. *Current Opinion and Environmental Sustainability*, 4: 212 – 218.
- \*Xu, N., J.E. Saiers, H.F. Wilson, P.A. Raymond. 2012. Simulating stream flow and dissolved organic matter export from a forested watershed, *Water Resources Research*, 48, 5, doi:10.1029/2011WR011423
- \*Karwan, D.K. and J.E. Saiers. 2012. Hyporheic exchange and streambed filtration of suspended particles. *Water Resources Research*, 48, 1, doi:10.1029/2011WR011173
- Jardine, P.M. 2011. T.L. Mehlhorn, W.B. Bailey, S.C. Brooks, S.E. Fendorf, R.W. Gentry, T.J. Phelps, and J.E. Saiers. Geochemical processes governing the fate and transport of Cr(III) and Cr(VI) in soils. *Vadose Zone Journal*, 10(3), 1058-1070, doi: 10.2136/vzj2010.0102.
- \*Cheng, T. and J.E. Saiers. 2010. Colloid facilitated-transport of cesium in vadose-zone sediments: The importance of flow transients. *Environmental Science and Technology*, 44(19), 7443-7449, doi: 10.1021/es100391j.
- \*Xu, N. and J.E. Saiers. 2010. Temperature and hydrologic controls on dissolved organic matter mobilization and transport within a forest topsoil. *Environmental Science and Technology*, 44(14), 5423-5429, doi: 10.1021/es1002296.
- Raymond, S. and J.E. Saiers. 2010. Event controlled DOC export from forested watersheds. *Biogeochemistry*, 100(1-3), 197-209, doi: 10.1007/s10533-010-9416-7
- \*Karwan, D. and J.E. Saiers. 2009. Influences of seasonal flow regime on the fate and transport of fine particles and a dissolved solute in a New England Stream. *Water Resources Research*, 45, W11423, doi:10.1029/2009WR008077.
- \*Cheng, T. and J.E. Saiers. 2009. Mobilization and transport of in situ colloids during drainage and imbibition of partially saturated sediments, *Water Resources Research*, 45, W08414, doi:10.1029/2008WR007494
- \*Xu, S. and J.E. Saiers. 2009. Colloid straining within water-saturated porous media: Effects of colloid-size nonuniformity, *Water Resources Research* 45, W05501, doi:10.1029/2008WR007258.
- \*Xu, S., Q. Liao, and J.E. Saiers. 2008. Straining of non-spherical colloids in saturated porous media. *Environmental Science and Technology*, 42, 771-778.
- \*Huang, Y. H., J. E. Saiers, J. W. Harvey, G B. Noe, and S. Mylon. 2008. Advection, dispersion, and filtration of fine particles within emergent vegetation of the Florida Everglades, *Water Resources Research*, 44, W04408, doi:10.1029/2007WR006290.

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\* Graduate student or postdoctoral advisee

- Noe, G., J.W. Harvey, and J.E. Saiers. 2007. Characterization of suspended particles in Everglades wetlands. *Limnology and Oceanography*, 52, 1166-1178.
- Saiers, J.E. and J.N. Ryan. 2006. Introduction to Special Section on Colloid Transport in Subsurface Environments. *Water Resources Research*, 42, W12S01, doi:10.1029/2006WR005620.
- Turner, N. B., J.N. Ryan, and J.E. Saiers. 2006. The effect of desorption kinetics on colloid-facilitated transport of contaminants: Cesium, strontium, illite colloids, and a saturated quartz porous medium. *Water Resources Research*, 42, W12S09, doi:10.1029/2006WR004972
- \*Xu, S., B. Gao, and J.E. Saiers. 2006. Straining of colloidal particles in saturated porous media. *Water Resources Research*, 42, W12S16, doi:10.1029/2006WR004948.
- Levin, J.M., J.S. Herman, G.M. Hornberger, and J.E. Saiers. 2006. Colloid Mobilization from a Variably Saturated, Intact Soil Core. *Vadose Zone Journal*, 5: 564-569.
- \*Gao, B. J. E. Saiers, and J.N. Ryan. 2006. Pore-scale mechanisms of colloid deposition and mobilization during steady and transient flow through unsaturated granular media. *Water Resources Research*, 42, W01410, doi: 10.1029/2005WR004233.
- Saiers, J.E. and J.N. Ryan. 2005. Colloid deposition on non-ideal porous media: The influences of collector shape and roughness on the single-collector efficiency. *Geophysical Research Letters*, 32, L21406, doi: 10.1029/2005GL024343.
- Harvey, J.W., J.E. Saiers, and J.T. Newlin. 2005. Solute transport and dispersion in wetlands of the Everglades, South Florida. *Water Resources Research*, 41, W05009, doi: 10.1029/2004WR003507.
- \*Gao, B., J.E. Saiers, and J.N. Ryan. 2004. Deposition and mobilization of clay colloids in unsaturated porous media. *Water Resources Research*, 40(8), W08602, doi: 10.1029/2004WR003189.
- Denovio, N.M., J.E. Saiers, and J.N. Ryan. 2004. Colloid movement in unsaturated porous media: Recent advances and future directions. *Vadose Zone Journal*, 3: 338-351.
- \*Lenhart, J.J. and J.E. Saiers. 2004. Adsorption of natural organic matter to air-water interfaces during transport through unsaturated porous media. *Environmental Science and Technology*, 38(1): 120-126.
- Saiers, J.E., D.P. Genereux, and C.H. Bolster. 2004. Influence of calibration methodology on ground-water flow predictions. *Ground Water*, 42(1): 32-44.

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\* Graduate student or postdoctoral advisee.



- Villinski, J.E., J.E. Saiers, and M.H. Conklin. 2003. The effects of reaction-product formation on the reductive dissolution of MnO<sub>2</sub> by Fe(II). *Environmental Science and Technology*, 37(24): 5589-5596.
- Saiers, J.E., G.M. Hornberger, D.B. Gower, and J.S. Herman. 2003. The role of moving air-water interfaces in colloid mobilization within the vadose zone. *Geophysical Research Letters*, 30(21), 2083, doi: 10.1029/2003GL018418.
- \*Lenhart, J.J. and J.E. Saiers. 2003. Colloid mobilization in water-saturated porous media under transient chemical conditions. *Environmental Science and Technology*, 37(12): 2780-2787.
- Saiers, J.E., J.W. Harvey, and S.E. Mylon. 2003. Surface-water transport of suspended matter through wetland vegetation of the Florida everglades. *Geophysical Research Letters*, 30(19), 1987, doi: 10.1029/2003GL018132.
- Saiers, J.E. and J.J. Lenhart. 2003. Ionic-strength effects on colloid transport and interfacial reactions in partially saturated porous media. *Water Resources Research*, 39(9), 1256, doi: 10.1029/2002WR001887.
- Saiers, J.E. and J.J. Lenhart. 2003. Colloid mobilization and transport within unsaturated porous media under transient-flow conditions. *Water Resources Research*, 39(1), 1019, doi: 10.1029/2002WR001370.
- \*Bolster, C.H. and J.E. Saiers. 2002. Development and evaluation of a mathematical model for surface-water flow within the Shark River Slough of the Florida Everglades. *Journal of Hydrology*, 259: 221-235.
- \*Lenhart, J.J. and J.E. Saiers. 2002. Transport of silica colloids through unsaturated porous media: Experimental results and model comparisons. *Environmental Science and Technology*, 36(4): 769-777.
- Saiers, J.E. 2002. Laboratory observations and mathematical modeling of colloid-facilitated contaminant transport in chemically heterogeneous systems. *Water Resources Research*, 38(4), 1032, doi: 10.1029/2001WR000320.
- \*Bolster, C.H., D.P. Genereux, and J.E. Saiers. 2001. Determination of specific yield for a limestone aquifer from a canal drawdown test. *Ground Water*, 39(5): 768-777.
- \*Guha, H., J.E. Saiers, S.C. Brooks, P.M. Jardine, and K. Jaychandran. 2001. Chromium transport, oxidation, and adsorption within  $\beta$ -MnO<sub>2</sub>-coated sand. *Journal of Contaminant Hydrology*, 49: 311-344.

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\* Graduate student or postdoctoral advisee.

- Saiers, J.E., H. Guha, P.M. Jardine, and S.C. Brooks. 2000. Development and evaluation of a mathematical model for the transport and oxidation-reduction of CoEDTA. *Water Resources Research*, 36(11): 3151-3165.
- Saiers, J.E. and G. Tao. 2000. Evaluation of continuous distribution models for rate-limited solute adsorption to geologic solids. *Water Resources Research*, 36(7): 1627-1639.
- Zechner, E., D.P. Genereux, and J.E. Saiers. 2000. The benefit of using data on canal seepage and tracer concentration in aquifer parameter estimation. In: *Calibration and Reliability in Groundwater Modeling: Coping with Uncertainty, Proceedings of the ModelCARE 99 Conference, Zürich, Switzerland, September 1999*. International Association of Hydrological Sciences Publication Number 265: 256-262.
- Saiers, J.E. and G.M. Hornberger. 1999. The influence of ionic strength on the facilitated transport of cesium by kaolinite colloids. *Water Resources Research*, 35(6): 1713-1727.
- O'Shea, K.E., E. Pernas, and J.E. Saiers. 1999. The influence of mineralization products on the coagulation of TiO<sub>2</sub> photocatalyst. *Langmuir*, 15(6): 2071-2076.
- Saiers, J.E. and G.M. Hornberger. 1996. Migration of <sup>137</sup>Cs through aquifer materials: Experimental results and modeling approaches. *Journal of Contaminant Hydrology*, 22: 255-270.
- Saiers, J.E. and G.M. Hornberger. 1996. Modeling bacterial-facilitated transport of DDT. *Water Resources Research*, 32(5): 1455-1459.
- Saiers, J.E. and G.M. Hornberger. 1996. The role of colloidal kaolinite in the transport of cesium through laboratory sand columns. *Water Resources Research*, 32(1): 33-41.
- Saiers, J.E., G.M. Hornberger, and C. Harvey. 1994. Colloidal silica transport through structured, heterogeneous media. *Journal of Hydrology*, 163: 271-288.
- Saiers, J.E., G.M. Hornberger, and L. Liang. 1994. First- and second-order approaches for modeling the fate and transport of colloidal particles in porous media. *Water Resources Research*, 30(9): 2499-2506.

### **Magazine Articles**

- Saiers, J.E. 2020. Why Scientists Should Shape Environmental Policy. *Foreign Policy*, March 14, 2020.

### **Book Chapters**

- Saiers, J.E. 2019. Science as the Foundation of Policy: The Case of Fracking. In: *A Better Planet: 35 Ideas for a Sustainable Future*. Yale University Press.

Barth-Naftilan, E. and J.E. Saiers. 2015. Unconventional Fossil Fuels and Water Resources. In: Treatise of Geophysics.

Saiers, J.E. 2012. An insider's view of the academic job search. In: W. McHenry and J. McHenry's Obtaining an Academic Appointment. Anker Publishing Company.

Mills, A.L. and J.E. Saiers. 1993. Particle associated transport of pollutants in subsurface environments. In: S.S. Rao (Ed.) Particulate Matter in Aquatic Environments, Chelsea, Michigan: Lewis Publishers, Inc. pp. 105-126.

Saiers, J.E., J.F. McCarthy, P.M. Jardine, L. Liang, and G.M. Hornberger. 1993. Transport of amorphous TiO<sub>2</sub> through homogeneous and structurally heterogeneous porous media, In: J.F. McCarthy and F.J. Wobber (Eds.) Concepts for Manipulating Groundwater Colloids for Environmental Restoration, Chelsea Michigan: Lewis Publishers, Inc. pp. 309-313.

## **INVITED SEMINARS AND SYMPOSIA**

- 2019            Massachusetts Institute of Technology, Boston MA
- 2019            American Geophysical Union Conference, San Francisco, CA.
- 2019            Indiana University of Pennsylvania, Indiana PA
- 2018            American Petroleum Institute, Washington DC
- 2017            US Environmental Protection Agency, Washington DC (webinar)
- 2017            National Groundwater Association Conference, Columbus, OH
- 2017            Yale Institute of Biospheric Studies, New Haven, CT
- 2017            American Petroleum Institute, Washington, DC
- 2016            Geological Society of America Conference, Denver, CO.
- 2015            National Research Council Webinar on Aquifer Storage and Recovery in South Florida
- 2015            Next Generation of Environmental Practices for Shale Gas Development, Nature Conservancy, Pittsburgh, PA
- 2015            Yale Alumni in Energy Conference, New Haven, CT

2015 American Chemical Society Conference, Denver, CO

2014 Conference of the American Geophysical Union, San Francisco, CA

2014 American Industrial Hygiene Conference, Plantsville, CT

2013 Land-Use Law Center, Pace University, White Plains, NY

2013 American Bar Association, Chicago Section Annual Conference, Chicago, IL

2012 Connecticut Department of Energy and Environmental Protection, Hartford, CT

2012 The Yale Center for Environmental Law and Policy, The Policy Workshop Webinar Series, New Haven, CT

2012 School of Forestry and Environmental Studies, New Haven, CT

2012 Yale New Directions in Environmental Law Conference, New Haven, CT

2011 Resources for the Future, Washington, DC

2008 Conference of the American Geophysical Union, San Francisco, CA

2008 Conference of the American Geophysical Union, Fort Lauderdale, FL

2008 Keynote Speaker, ELKIN Conference, Santa Fe, NM

2008 Keynote Speaker, Conference of the American Chemical Society, Raleigh, NC

2008 Yale Institute of Biospheric Studies, Yale University

2006 DOE ERSP Workshop, Oak Ridge, TN

2006 DOE EMSP Workshop, Idaho National Engineering Lab

2006 Gordon Research Conference, Proctor Academy, NH

2006 Department of Earth and Environmental Sciences, Vanderbilt University

2005 Geological Society of America National Meeting, Salt Lake City, UT

2005 Department of Bioengineering, Oregon State University

2005 European Geosciences Union General Assembly, Vienna, Austria

2004 Department of Geological and Environmental Sciences, Stanford University

2004 Fall Meeting of the American Geophysical Union, San Francisco, CA

2004 227<sup>th</sup> American Chemical Society National Meeting, Anaheim, California

2003 Institute of Biospheric Studies, Yale University

2003 DOE EMSP Workshop, Pacific Northwest Labs

2002 Department of Plant and Soil Sciences, University of Delaware

2002 Department of Environmental Sciences, University of Virginia

2001 Department of Environmental Engineering, University of Connecticut

2001 Goldschmidt Conference, Hot Springs, Virginia

1999 Department of Geosciences, State University of New York at Stony Brook

1999 Department of Geology, University of South Carolina

1997 Department of Geosciences, The Pennsylvania State University

1996 Miami Geological Society

1996 Southeastern Environmental Research Program, Florida International University

1995 Department of Geology, Florida International University

1995 Environmental Sciences Division, Oak Ridge National Laboratory

1995 HydroGeoLogic Inc., Herndon, Virginia

1995 Papadopolous Environmental Consulting, Bethesda, Maryland

1995 Rosentiel School of Marine and Atmospheric Sciences, University of Miami

### **CONFERENCE PRESENTATIONS (Partial Listing)**

Soriano, M. K.M. Gutchess, H. Siegel, C. Clark, Y. Li, B Xiong, D. Plata, N.C. Deziel, and J.E. Saiers. 2019. Modeling and Measurements of Methane Migration in Shallow Aquifers of the Northeastern Appalachian Basin. AGU Fall Meeting Abstracts 2019, H51L-1643.

- Saiers, J.E., Helen Siegel, Erica Barth-Naftilan, M Soriano Jr. 2019. Modeling and Measurements of Methane Migration in Shallow Aquifers of the Northeastern Appalachian Basin. AGU Fall Meeting Abstracts, H54B-07
- Gutchess, K.M., H. Siegel, M. Soriano, E. Barth-Naftilan, E. Ryan, Boya Xiong, R.J. Brenneis, N.C. Deziel, and J.E. Saiers. 2018. Evaluating the impacts of unconventional oil and gas development on domestic water wells in northeastern Pennsylvania Using pre- and post-drill measurements. American Geophysical Union Conference, Washington, DC.
- Soriano M., E. Barth-Naftilan, K. Gutchess, N.C. Deziel, J.E. Saiers. 2018. Modeling Groundwater Vulnerability to Contamination from Unconventional Oil and Gas Development: Uncertainty Analysis Using Linear-based Methods. AGU Fall Meeting Abstracts 2018, H43D-2424.
- Fair, J. S. Matt, J.E. Saiers, P.A. Raymond, and J. Shanley 2018. Use of high temporal and spatial resolution data to examine hydrologic controls on dissolved organic carbon and major ion variability in nine nested watersheds within the Passumpsic River Watershed, VT, USA. Geological Society of America Northeastern Section Meeting.
- Saiers, J.E. and E. Barth-Naftilan. 2017. Methane Occurrence in a Drinking Water Aquifer Before and During Natural Gas Production from the Marcellus Shale. American Geophysical Union, Fall Meeting, New Orleans, LA.
- Soriano, M., N. Deziel, and J.E. Saiers. 2017. Addressing Environmental Concerns of Hydraulic Fracturing Focusing on Water Quantity and Quality. American Geophysical Union, Fall Meeting, New Orleans, LA.
- Hoyle, J J.E. Saiers, P.A. Raymond and J. Shanley, 2017. BIOGEOMON- 9th International Symposium on Ecosystem Behavior, Lisomysl, Czech Republic.
- Barth-Naftilan, E. and J.E. Saiers. 2017. Evaluating changes in freshwater quality using groundwater monitoring wells in areas of natural-gas development. National Groundwater Association Conference on Groundwater Quality and Unconventional Oil and Gas Development. Columbus, OH. April 25-26, 2017.
- Barth-Naftilan, E. J. Sohng, and J.E. Saiers. 2017. Spatial and temporal trends in groundwater quality surrounding shale gas wells in the Marcellus Shale. Society for Freshwater Science Annual Meeting, Raleigh, NC. June 4-8.
- Saiers, J.E. and E. Barth-Naftilan. 2016. Evaluating changes in freshwater quality in areas of natural-gas development within the Marcellus Shale Play. Geological Society of America Annual Conference, Denver Colorado, September 25-28, 2016.
- Hoyle, J., J.E. Saiers, P.A. Raymond and W.V. Sobczak, 2015. Gordon Research Conference: Catchment Science: Interactions of Hydrology, Biology and Geochemistry, Andover, NH.

- Hoyle, J., J.E. Saiers, P.A. Raymond and W.V. Sobczak, 2015. American Geophysical Union Joint Assembly, Montreal, Canada.
- Hoyle, J., J.E. Saiers, P.A. Raymond, W.V. Sobczak, 2014. American Geophysical Union Fall Meeting, San Francisco, California.
- Hoyle, J., Saiers, J.E., Ashton, M., and Gentry, B. 2013. Green Infrastructure Effectiveness at the Watershed Scale: A Synthesis of Performance and Strategies to Maximize Cumulative Hydrological Benefits. American Water Resource Association, Specialty Conference: Healthy Forests = Healthy Waters, Hartford, CT.
- Barth-Naftilan, E., N. Aloysius, and J.E. Saiers. 2013. "Stream Flow and Frac Water Withdrawals in Pennsylvania," The Geological Society of America Annual Meeting, October 2013.
- Aloysius, N. R., J. Saiers, et al. (2013). 20th and 21st Century Climate Simulations and Projections in Central Africa by CMIP5 Climate Models. AGU Fall Meeting, San Francisco, CA, American Geophysical Union.
- Bouda M., Saiers, J. E. 2012. Representing root system architecture in Dynamic Vegetation Models: Results of a combined model of root system growth and soil water uptake. Ecological Society of America, Annual Meeting, Portland, OR
- Aloysius, N. and J.E. Saiers. 2011. Hydrologic Partitioning of Evapotranspiration, Flows and Storage Across Landscapes and Climate Regimes in the Congo Basin. *Abs., EOS, Trans. Amer. Geophys. Union, Fall Meet. Suppl.*
- Yang, Y., J.E. Saiers, N. Xu, T. Tylliszczak, D. Shuh, M. Barnett. 2011. Impact of Natural Organic Matter on Uranium Transport through Saturated Geologic Materials: From Molecular to Column Scale. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Mohanty, S. J., J.N. Ryan, J.E. Saiers. 2011. Fate and Transport of Emerging Contaminants, Microorganisms, Colloids, and Engineered Nanoparticles in the Environment. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Dittrich, T.M., J.N. Ryan, J.E. Saiers, 2011. The Effect of a Simulated Macropore on the Colloid-Facilitated Transport of Cesium and Strontium: Experiment and Model Results. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Mohanty, S. K., J.N. Ryan, and J.E. Saiers. 2011. Mobilization of cesium and strontium in a vadose zone by cation exchange, organic matter, and colloids: A laboratory and field study, *Conference of the American Chemical Society, Denver Colorado.*
- Mohanty, S. K., J.N. Ryan, and J.E. Saiers. 2011. Mobilization of colloids and metals from intact cores of a fractured soil: Role of pore water exchange between soil matrix and macropores. *Soil Science Society of America Annual Meeting, San Antonio, TX - Oct. 16-19.*

- Xu, N. and J.E. Saiers. 2010. Simulating Streamflow and Dissolved Organic Matter Export from small Forested Watersheds. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Bouda, M. and J.E. Saiers. 2010. Modelling root soil-water extraction of two different root systems in 3D. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Mohanty, S., J.N. Ryan, and J.E. Saiers. 2010. Mechanism of the hysteresis in the amount of *in-situ* colloids mobilized with ionic strength in a fractured soil. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Dittrich, T., J.N. Ryan, and J.E. Saiers. 2010. The Role of Desorption Kinetics on the Colloid-Facilitated Transport of Cesium and Strontium in a Partially-Saturated Quartz Sand Column. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Aloysius, N. and J.E. Saiers. 2010. Modeling the Variability of Blue and Green Water Flows in the Congo Basin. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Xu, N. and J.E. Saiers. 2010. Simulating Streamflow and Dissolved Organic Matter Export from small Forested Watersheds. *Abs., EOS, Trans. Amer. Geophys. Union.*
- Xu, N. and J.E. Saiers. 2009. Temperature and Hydrological Controls on Dissolved Organic Matter Mobilization and Transport within forest soils. *Abs., EOS, Trans. Amer. Geophys. Union, 90(52), Fall Meet. Suppl.*
- Karwan, D. and J.E. Saiers. 2009. Storage and Hyporheic Exchange of Tracers in a Step-Pool Sequence of a New England Stream. *Abs., EOS, Trans. Amer. Geophys. Union, 90(52), Fall Meet. Suppl.*
- Dittrich, T., J.N. Ryan, and J.E. Saiers. 2009. The Role of Partially-Saturated Conditions, Physical Heterogeneity, and Desorption Kinetics on Colloid-Facilitated Transport of Cesium and Strontium by Illite in Quartz Sand. *Abs., EOS, Trans. Amer. Geophys. Union, 90(52), Fall Meet. Suppl.*
- Cheng, T., and J. E. Saiers. 2009. Colloid and cesium-137 mobilization and transport in vadose-zone sediments under transient-flow conditions. ASA-CSSA-SSSA Annual Meetings. Pittsburgh, PA, USA, November 1-5.
- Saiers, J. E. and T. Cheng. 2008. Measurements and Model Simulations of Colloid Mobilization During Imbibition and Drainage of Unsaturated Soils. *Abs., EOS, Trans. Amer. Geophys. Union, 89(53), Fall Meet. Suppl.*
- Cheng, T. and J.E. Saiers. 2008. Colloid and Cs-137 Mobilization and Transport in Vadose Zone Sediments under Transient Flow Conditions. *Abs., EOS, Trans. Amer. Geophys. Union, 89(53), Fall Meet. Suppl.*



- Xu, N. and J.E. Saiers. 2008. Effects of Hydrology and Temperature on Dissolved Organic Matter Mobilization and Transport within forest soils. *Abs., EOS, Trans. Amer. Geophys. Union*, 89(53), *Fall Meet. Suppl.*
- Saiers, J.E. and T. Cheng. 2008. Colloid Mobilization and Transport Through Vadose-Zone Soils: Experimental Data and Modeling Approaches. . *Abs., EOS, Trans. Amer. Geophys. Union*, 89(23), *Spring Meet. Suppl.*
- Karwan, D. and Saiers, J. 2008. Stream channel storage of fine particulate material. Conference of the European Geosciences Union.
- Aloysius, N. R., J. Saiers, et al. (2008). The Role of Climate Change in the Vulnerability and Resilience of Water Resources within the Rio Bravo River Basin. NOAA's 33rd Climate Diagnostics and Prediction Workshop/CLIVAR Drought Workshop. Lincoln, Nebraska, USA.
- Cheng, T. and Saiers, J.E. 2007. Natural Colloid Mobilization in Unsaturated Hanford Coarse Sand Under Transient Flow and Transient Chemical Conditions. *Abs., EOS, Trans. Amer. Geophys. Union*, 88(52), *Fall Meet. Suppl.*
- Karwan, D. and Saiers, J.E. 2007. Transient Storage of Suspended Particulate Material in a New England Stream. *Abs., EOS, Trans. Amer. Geophys. Union*, 88(52), *Fall Meet. Suppl.*
- Xu, N. and Saiers, J.E. 2007. Hydrologic Controls on Dissolved Organic Matter Mobilization and Transport within Undisturbed Soils. *Abs., EOS, Trans. Amer. Geophys. Union*, 88(52), *Fall Meet. Suppl.*
- Karwan, D., J. Saiers, and J.A. Gravelle. 2006. Comparison of Dissolved and Suspended Matter Transport in the Mica Creek Experimental Watershed, Northern Idaho. *Abs., EOS, Trans. Amer. Geophys. Union*
- Ryan, J.N., Turner, N. and Saiers, J. 2006. Colloids, Contaminants, and Surface Chemistry: Effect of Desorption Kinetics on the Facilitated Transport of Cesium and Strontium by Illite. AICHE 2006 Annual Meeting, San Francisco, CA.
- Ryan, J.N., J.E. Saiers, N.B. Turner, and T. Dittrich. 2006. A brief history of colloid-facilitated transport: role of solute desorption kinetics. Geological Society of American 2006 Annual Meeting, Philadelphia, PA, October 22 – 25, 2006.
- Harvey, J.W., Noe, G. Schaffranek, R., Saiers, J., Huang, Y. and Larsen, L. 2006. Understanding Linkages between Sheet Flow and Suspended Sediment Transport Processes in the Ridge and Slough Landscape. *Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem*, June 5 – 9, 2006.

- Huang, Y, J.E. Saiers, J.W. Harvey, and G. Noe. 2006. Particle transport through surface waters of the Florida Everglades. *Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem*, June 5 – 9, 2006.
- Noe, G., J.W. Harvey, R. Schaffranek, and J. Saiers. 2006. Spatiotemporal variation in the biogeochemical characteristics of suspended particles in the Everglades: Implications for the ridge and slough landscape. *Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem*, June 5 – 9, 2006
- Harvey, J.W., J.K. Bohlke, M.H. Conklin, C.C. Fuller, A. I Packman, and J. E. Saiers. 2005. The expanding scope of hyporheic-zone investigations in streams, rivers, and wetlands: connecting small-scale storage processes with reach-scale cumulative effects. Geological Society of America Meeting, Salt Lake City, UT, October 16-19, 2005.
- Levin, J.M., J.S. Herman, G.M. Hornberger, and J.E. Saiers. 2005. Rates of colloid mobilization in an unsaturated, sandy soil. Geological Society of America Meeting, Salt Lake City, UT, October 16-19, 2005.
- Saiers, J.E., Gao, B., Xu, S., and Ryan, J.N. 2005. Colloid mobilization and deposition in Unsaturated Porous Media. Geological Society of America Meeting, Salt Lake City, UT, October 16-19, 2005.
- Levin, J.M., Herman, J.S. Hornberger, G.M., Saiers, J.E.. 2005. Rates of colloid mobilization in sandy, unsaturated soil. Geological Society of America Meeting, Salt Lake City, UT, October 16-19, 2005.
- Turner, N.B., J.N. Ryan, and J.E. Saiers. 2005. Effect of cation desorption kinetics on colloid-facilitated transport of cesium and strontium. ACS National Meeting, San Diego, CA, March 13-17, 2005
- Noe, G., J.W. Harvey, and J.E. Saiers. 2005. The Role of Particulate Phosphorus in Everglades Wetlands. 9<sup>th</sup> International Symposium on Biogeochemistry of Wetlands.
- Gao, B. and J.E. Saiers. 2004. Influence of pH on deposition and mobilization of clay colloids in unsaturated porous media. *Proceedings of the 78<sup>th</sup> ACS Colloid and Surface Science Symposium*, New Haven, CT, June 20 – June 23, 2004.
- Saiers, J.E., J.J. Lenhart, and B. Gao. 2004. Colloid mobilization, transport, and deposition in unsaturated porous media. *Proceedings from the 227<sup>th</sup> ACS National Meeting*, Anaheim, CA, March 28 – April 1, 2004.
- Harvey, J.W., J.E. Saiers, J.T. Newlin. 2003. Solute transport and surface-subsurface exchange in the Everglades characterized by a tracer release in surface water. *Abs., EOS, Trans. Amer. Geophys. Union*, 84: F691.

- Levin, J.M., J.S. Herman, G.M. Hornberger, and J.E. Saiers. 2003. Field-scale colloid mobilization in an unsaturated, sandy soil. *Geological Society of America Abstracts with Programs*, 35(6): 572
- Harvey, J.W., J.E. Saiers, J.M. Krest, S. Mylon, J.T. Newlin, C. Taylor, and E. Gaiser. 2003. Characterizing transport processes in the Everglades: Goals, approaches, and preliminary results from a tracer release in the FIU/SERC experimental flumes. *Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem*, April 13-18, Palm Harbor, Florida, p. 249.
- Levin, J., J.S. Herman, G.M. Hornberger, and J.E. Saiers. 2002. The effect of soil-water tension on colloid generation within an unsaturated, intact soil core. *International Workshop on Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments*. DIAS Report, Plant Production no. 80, p. 107.
- Gower, D., J.S. Herman, G.M. Hornberger, J.J. Lenhart, and J.E. Saiers. 2002. Colloid stripping by an advancing drying front. *International Workshop on Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments*. DIAS Report, Plant Production no. 80, p. 131.
- Lenhart J.J. and J. E. Saiers. 2002. Coupling release kinetics with solute transport to simulate colloid entrainment. *Proceedings of the 76<sup>th</sup> Colloid and Surface Science Symposium*, Ann Arbor, MI.
- Osgood, D., J.E. Saiers, R. Orson, T. Hoffman, K. Manasfi, and R. Sappe. 2002. Changes in peat structure following tidal marsh restoration: Implications for nutrient exchange. *23<sup>rd</sup> Annual Conference of the Society of Wetland Scientists*, June 2-7 2002 Lake Placid, NY.
- Bolster, C.H., D.P. Genereux, and J.E. Saiers. 2002. (Invited) Use of a canal drawdown test to calculate the specific yield of the Biscayne Aquifer. *Abs., EOS, Trans. Amer. Geophys. Union*, 83(19): S164.
- Hornberger, G.M., J.E. Saiers, J.J. Lenhart, J. Levin. 2001. Mobilization and transport of colloids in the vadose zone. *Abs., EOS, Trans. Amer. Geophys. Union*, 82: F462.
- Saiers, J.E., C.H. Bolster, and T. Smith, 2000. Development and evaluation of a surface-water flow model for Shark River Slough, Florida. *Proceedings of the Greater Everglades Ecosystem Restoration Conference*, pp. 352-353.
- Guha, H., J.E. Saiers, S.C. Brooks, and K. Jayachandran. 1999. Reactive transport of chromium in the presence of  $\beta$ -MnO<sub>2</sub> coated-sand. *Abs., EOS, Trans. Amer. Geophys. Union*, 80: F378.
- Smith, T.J, G.H. Anderson, W.K. Nuttle, and J.E. Saiers. 1999. Hydrologic variation and ecological processes in the mangrove forests of south Florida. *Proceedings of the South Florida Restoration Science Forum*, pp. 100-101.

- Zechner, E., D.P. Genereux, and J.E. Saiers. 1999. The benefit of additional observation data sets in aquifer parameter estimation. *Proceedings for ModelCARE '99 Conference*, pp. 259-264.
- Kauffman, S.J., J.E. Saiers, J.S. Herman, G.M. Hornberger, and N.M. Denovio. 1998. Colloid-facilitated contaminant transport in unsaturated, heterogeneous media. *Abs., EOS, Trans. Amer. Geophys. Union*, 79: S144.
- Guha, H., J.E. Saiers, P.M. Jardine, and S.C. Brooks. 1998. Development and evaluation of a mathematical model for oxidation, sorption, and transport of Co(II)EDTA<sup>2-</sup>. *Abs., EOS, Trans. Amer. Geophys. Union*, 79: F314.
- Zechner, E., J.E. Saiers, and D.P. Genereux. 1997. Using water and tracer flux information at canal boundaries to improve aquifer parameter estimation: Biscayne Aquifer, Florida. *Abs., European Geophysical Society*, 16: C438.
- Zechner, E., D.P. Genereux, J. Guardiaro, and J.E. Saiers. 1997. Estimation of aquifer parameters in highly permeable limestone (Biscayne Aquifer, Florida). *Proceedings of the Sixth Conference on Limestone Hydrology and Fissured Media*, 2:199.
- Kauffman, S.J., J.S. Herman, G.M. Hornberger, and J.E. Saiers. 1997. Colloid-facilitated transport of cesium in an unsaturated soil. *Abstracts of the Geological Society of America Annual Meeting*, Salt Lake City, Utah, 29(6): A249.
- Mehlhorn, T.L., P.M. Jardine, S.C. Brooks, S.E. Fendorf, and J.E. Saiers. 1997. Geochemical processes governing the fate and transport of Cr(III) and Cr(VI) in soil. *Abstracts of the 1997 Soil Science Society of America Meeting*, 26-31 October, Anaheim, California.
- Saiers, J.E., G. Tao, and G.M. Hornberger. 1997. Colloid-facilitated transport of herbicides. *Abs., EOS, Trans. Amer. Geophys. Union*, 78: 152.
- Pernas, E., K.E. O'Shea, and J.E. Saiers. 1997. Effect of physico-chemical properties on the coagulation of a TiO<sub>2</sub> photocatalyst. *Florida American Chemical Society Meeting*, Orlando, Florida, May 2-4, 1997.
- Knapp, E.P., J.S. Herman, G.M. Hornberger, A.L. Mills, R.W. Dobson, C.H. Bolster, and J.E. Saiers. 1996. The effect of aquifer heterogeneity on the transport of reactive solutes: Sulfate transport in a coastal plain aquifer. *Abs., EOS, Trans. Amer. Geophys. Union*, 77: 139-140.
- Sprague, L.A., S.E. Johnson, S.J. Kauffman, J.S. Herman, G.M. Hornberger, and J.E. Saiers. 1996. Atrazine adsorption and simulation of colloid-facilitated transport of atrazine in the soil zone. *Abs., EOS, Trans. Amer. Geophys. Union*, 77: 132.
- Saiers, J.E. and G.M. Hornberger. 1995. The influence of colloidal kaolinite on the migration of <sup>137</sup>Cs through water-saturated porous media. *Abs., EOS, Trans. Amer. Geophys. Union*, 76: 144.

Saiers, J.E., G.M. Hornberger, A.L. Mills, and J.S. Herman. 1993. The influence of colloidal kaolinite on  $^{137}\text{Cs}$  transport through porous media. *Abs., EOS, Trans. Amer. Geophys. Union*: 74: 271.

Saiers, J.E. and G.M. Hornberger. 1992. A numerical model of colloid-facilitated transport of contaminants in porous media. *Abs., EOS, Trans. Amer. Geophys. Union*, 73: 177.

Saiers, J.E., D.E. Fontes, G.M. Hornberger, J.S. Herman, and A.L. Mills. 1990. Transport of bacteria and chloride through structured, heterogeneous porous media. *Abs., EOS, Trans. Amer. Geophys. Union*, 71: 503.

### **RESEARCH GRANTS (Funded)**

2017 – 2021 United States Environmental Protection Agency. Drinking water vulnerability and neonatal health outcomes in relation to oil and gas production in the Appalachian Basin. N. Deziel (PI) J. Saiers (PI) and Co-PIs D. Plata, M. Bell, X. Ma., and J Warren. \$1,998,515.

2015 - 2017 National Science Foundation. Evaluating Groundwater Quality Impacts of Shale Gas Extraction within the Marcellus Shale Play. \$151,000

2014 – 2017 Southwestern Energy, Changes in Freshwater Quality in Areas of Natural-Gas Development within the Marcellus Shale Play. \$300,000

2014 - 2017 JP Morgan Chase, Evaluating Potential Impacts of Hydraulic Fracturing on Drinking Water Quality. \$200,000

2014 - 2020 National Science Foundation. Collaborative Research: RUI: The Pulse-Shunt Concept: A Conceptual Framework for Quantifying and Forecasting Watershed DOM Fluxes and Transformations at the MacroSystem Scale. \$2,400,000 (with Pete Raymond (Lead) and others)

2015 - 2017 Yale Climate and Energy Institute. Influences of Shale-Gas Development on Groundwater Flow and Chemistry. \$100,000.

2015 - 2017 Yale Center for Business and the Environment. Quantifying Trends in Groundwater Depletion Due to Hydraulic Fracturing: New Information for Regulators, Policy-Makers, and Investment Leaders, \$20,205 (with Erica Barth-Naftilan)

2013 – 2016 National Science Foundation. The Pulse-Shunt Hypothesis: Predicting the Evolution of DOM Composition and DOM Subsidies in Drainage Networks. \$600,000 (with Pete Raymond (Lead))

- 2014 – 2016 Yale Climate and Energy Institute. Freshwater Impacts of Shale-Gas Production. \$100,000
- 2010 – 2014 National Science Foundation. Colloid Mobilization and Transport in the Vadose Zone: New Observations and Modeling Approaches. \$263,544
- 2009 – 2012 U.S. Department of Energy. Understanding the Subsurface Reactive Transport of Transuranic Contaminants at DOE Sites \$700,000 (with Mark Barnett, Thomas Albrecht-Schmitt)
- 2008 – 2011 U.S. Department of Energy. Colloid-Facilitated Transport of Radioactive Cations in the Vadose Zone: Field Experiments at Oak Ridge National Laboratory, \$380,528 (with J. Ryan and P. Jardine).
- 2006 – 2008 U.S. Department of Energy. The role of natural organic matter and mineral colloids in the transport of contaminants through heterogeneous vadose-zone environments \$600,000 (with J. Ryan)
- 2004 – 2007 National Science Foundation. Colloid-Filtration Theory for Vadose-Zone Environments. \$208,046
- 2004 – 2006 United States Geological Survey. The Effect of Water Flow on the Transport of Suspended Particles and Particle-Associated Nutrients in the Everglades. \$71,268
- 2002 – 2004 United States Geological Survey. The Effect of Water Flow on the Transport of Suspended Particles and Particle-Associated Nutrients in the Everglades. \$71,305
- 2002 – 2005 Department of Energy. Influences of Flow Transients on Colloid-Associated Contaminant Transport in the Vadose Zone. \$600,000 (with J. Ryan)
- 2001 – 2002 New Jersey Sea Grant. Changes in Peat Structure Following Tidal Marsh Restoration: Implications for Nutrient Exchange. \$40,400. (with D. Osgood and R. Orson)
- 2000 – 2004 National Science Foundation. Colloid Mobilization and Transport in the Vadose Zone. \$250,000 (with J. Herman and G. Hornberger)
- 2001 – 2003 United States Geological Survey. Hydrologic Variation in the Mangrove Forests of South Florida: Response to Restoration. \$78,000.
- 2000 United States Geological Survey. Hydrological Variation and Ecological Processes in the Mangrove Forests of South Florida. \$74,331
- 1997 – 1999 U.S. Department of Energy. Containment of Toxic Metals and Radionuclides in Porous and Fractured Media: Optimizing Biogeochemical Reduction Versus Geochemical Oxidation. \$1,200,000 (with P. Jardine, S. Brooks, T. Phelps,

J. Zachara, and S. Fendorf)

- 1996 – 1999 National Science Foundation/Environmental Protection Agency. The Role of Colloidal Particles in the Transport of Chemicals Through an Agricultural Watershed \$500,000. (with G. Hornberger and J. Herman)
- 1996 – 2000 Army Research Office. Field Determination of Groundwater and Solute Fluxes to Streams, Rivers, and Canals, and Evaluation of the Significance for Calibration and Verification of Numerical Transport Models. \$233,990. (with D. Genereux)
- 1996 Oak Ridge Associated Universities. Colloid-Facilitated Transport: Laboratory Observations and Modeling Approaches. \$10,000.

## **TEACHING**

### **Courses Taught at Yale University (2000 to 2021)**

Energy Impacts on Freshwater Resources  
Environmental Hydrology  
Water Resources and Environmental Change  
Seminar on Freshwater Topics  
Watersheds Cycles and Process (with P. Raymond)  
Research Methods  
Hydrologic Modeling  
Special Topics in Hydrology  
Applied Hydrology (with J. McBroom)

## **ADVISING**

### **PhD Students and Postdoctoral Associates/Fellows**

Noel Aloysius, University of Missouri  
Erica Barth-Naftilan, Yale University  
Carl Bolster, United States Department of Agriculture  
Martin Bouda, Institute of Botany of CAS  
Tao Cheng, Memorial University  
Bin Gao, University of Florida  
Kristina Gutchess (Massachusetts Department of Conservation)

Chase Gerbig  
Kristina Gutchess, Yale University  
Jenn Hoyle, Yale University  
Yongheng Huang, Texas A&M University  
Diana Karwan, University of Minnesota  
John Lenhart, Ohio State University  
Helen Siegel, Yale University  
Mario Soriano, Yale University  
Henry Wilson, Agriculture Canada  
Na Xu, Validas  
Shangping Xu, University of Wisconsin Milwaukee  
Yu Yang, University of Nevada, Reno  
Jay Zarnetske, Michigan State University

**Master's Student Research Advising (2013-2019)**

Erica Barth  
Simon Gore  
Ambika Khadka  
Catherine Kuhn  
Vanessa Lamers  
Matthew Long  
Samantha Ostrowski  
Helen Siegel  
Elizabeth Tellman  
Katie Weber

**Summer Interns**

Sam Cohen  
Matthew Harnish  
Spencer Neaves  
Thalia Pinker



## LOCAL-LEVEL, NATIONAL-LEVEL, AND INTERNATIONAL-LEVEL SERVICE

- 2021 - Member, National Research Council Committee on the Ninth Scientific Review of Everglades Restoration Progress
- 2020 Member, U.S. Department of Energy Panel Review of Groundwater Quality Scientific Focus Area Program at SLAC National Laboratory.
- 2019 - 2020 Member, National Research Council Committee on the Eighth Scientific Review of Everglades Restoration Progress
- 2017 - 2018 Member, National Research Council Committee on the Seventh Scientific Review of Everglades Restoration Progress
- 2015 - 2016 Member, National Research Council Committee on the Sixth Scientific Review of Everglades Restoration Progress
- 2013 - 2016 Member, EPA Science Advisory Board Hydraulic Fracturing Research Advisory Panel
- 2014 - 2016 Working Group Member, Nature Conservancy's Science and Nature for People Project on Impacts of Hydraulic Fracturing on Water Quality and Quantity.
- 2012 - 2016 Member, Northeast-Midwest Institute's Shale Gas Development and Sustainable Water Technical Advisory Committee
- 2014 - 2015 Chair, National Academy of Sciences Committee on Review of Florida Aquifer Storage and Recovery Technology
- 2015 Member, National Science Foundation Proposal Review Panel
- 2015 Panelist, Review Panel for the National Science Foundation's, Chemical, Bioengineering, Environmental, and Transport Systems Program.
- 2013 Member, Editor-in-Chief Search Committee for *Reviews of Geophysics*
- 2012 EPA Technical Roundtable on the "Potential Impacts of Hydraulic Fracturing on Drinking Water Resources"
- 2012 National Science Foundation Proposal Review Panel
- 2012 - 2014 Member, National Research Council Committee on the Fifth Scientific Review of Everglades Restoration Progress.

- 2012 Panelist, Hydraulic Fracturing: A Bridge to a Clean Energy Future?
- 2012 Reviewer, European Commission DG Environment Report on “Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe.”
- 2012 Panelist, U.S. Department of Energy Science Focus Area Review for Oak Ridge National Lab
- 2012 Panelist, Yale Alumni in Energy Conference
- 2011 Session Co-Chair, American Geophysical Union Conference session on “Assessing the Role of Hydrologic Variability in Stream Nutrient Processing and Transport,” Fall Meeting
- 2009 Mail Panelist, U.S. Department of Defense, Corporate Environmental Research and Development Program, The Impact of Contaminant Storage in Low-Permeability Zones on Chlorinated Solvent Groundwater Plumes
- 2009 Panelist, U.S. Department of Energy Science Focus Area Review for Oak Ridge National Lab
- 2007 Panelist, DOE Workshop on Basic Research Needs for Geosciences: Facilitating 21st Century Energy Systems
- 2006 Panelist, Review Panel for the National Science Foundation’s Ecology of Infectious Disease Program.
- 2006 Panelist, Review Panel for the U.S. Department of Energy’s Scientific Discovery Through Advanced Computation Program
- 2004 - Member, Hydrology-Section Executive Committee, American Geophysical Union
- 2003 Moderator, Review Panel for the U.S. Department of Energy's Environmental Management Science Program (EMSP)
- 2002 Panelist, Review Panel for the U.S. Department of Energy's Environmental Management Science Program (EMSP)
- 2001 Member, URI Technical Committee on Park Restoration
- 2000 - Delegate, Universities Council on Water Resources
- 2000 International Examiner, Denmark Technical University
- 2000 Member, The Sound School Advisory Committee, New Haven, Connecticut

- 2000 Convenor, Special Session on Environmental Geohydrology, Meeting of the American Geophysical Union
- 1998 Coordinator, Hydrology Student Awards Committee, American Geophysical Union
- 1998 Convenor, Session on the Influence of Coupled Processes on Chemical Fate and Transport, Meeting of the American Geophysical Union
- 1998 Convenor, Special Session on Transport of Particles at the Microscale, Meeting of the American Geophysical Union.
- 1997 – 1998 Member, Expert Assistance Pool, South Florida Water Management District
- 1996 Convenor, Special Session on Colloid Transport, Meeting of the American Geophysical Union
- 1996 – 2004 Member, Groundwater Committee, American Geophysical Union

#### **PEER-REVIEW SERVICE**

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