

JOSEPH N. RYAN, PH.D.
Professor and Bennett-Lindstedt Faculty Fellow
Department of Civil, Environmental, and Architectural Engineering
University of Colorado Boulder

CONTACT INFORMATION

address: Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder, 428 UCB,
Boulder, Colorado 80309-0428, U.S.A.
telephone: +1 303-492-0772
e-mail: joseph.ryan@colorado.edu
web: <http://ceae.colorado.edu/faculty-staff/faculty/joseph-n-ryan/>

EDUCATION

Doctor of Philosophy, 1992, Environmental Engineering, Massachusetts Institute of Technology
Master of Science, 1988, Environmental Engineering, Massachusetts Institute of Technology
Bachelor of Science, 1983, Civil Engineering, Geological Engineering Program, Princeton University

CURRENT POSITION AND AFFILIATIONS

Professor and Bennett-Lindstedt Faculty Fellow, Department of Civil, Environmental, and Architectural
Engineering, University of Colorado Boulder, May 2004 to present
Affiliated Faculty, Environmental Studies Program, College of Arts and Sciences, University of Colorado
Boulder, December 2001 to present

PAST POSITIONS

Erskine Fellow, Department of Civil and Natural Resources Engineering, University of Canterbury, Christchurch, New
Zealand, July to November, 2008
Director, Environmental Engineering Undergraduate Degree Program, College of Engineering and Applied Science,
University of Colorado at Boulder, 2001 to 2006; 2012 to 2013
Associate Professor, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder,
2000 to 2004
Visiting Professor, Department of Chemical Engineering, and Visiting Fellow, Yale Institute for Biospheric Studies, Yale
University, January to May 2001
Assistant Professor, 1993 to 2000, Department of Civil, Environmental, and Architectural Engineering, University of
Colorado at Boulder
Postdoctoral Research Associate, 1992 to 1993, U.S. Geological Survey and Department of Civil, Environmental, and
Architectural Engineering, University of Colorado at Boulder
Staff Engineer/Geologist, 1983 to 1986, Earth Water and Air, Inc., Minneapolis, Minnesota

AWARDS

Bennett-Lindstedt Endowed Faculty Fellow, 2013-2018, Department of Civil, Environmental, and Architectural
Engineering, University of Colorado Boulder
Distinguished Achievement Award, 2009, Civil, Environmental, and Architectural Engineering, University of
Colorado Boulder
Boulder County Pacesetter Award (Science/Health/Medicine), 2008, Boulder *Daily Camera*
National Notable Achievement Award, 2006, U.S. Environmental Protection Agency, Member of the Left Hand
Watershed Revitalization Team
Teaching Award, 2004, 2008, Civil, Environmental, and Architectural Engineering, University of Colorado
Boulder

Research Development Award, 2001, Civil, Environmental, and Architectural Engineering, University of Colorado Boulder

Young Researcher Award, 1995, Civil, Environmental, and Architectural Engineering, University of Colorado Boulder

REFEREED JOURNAL ARTICLES

- Thurman E.M., Ferrer I., Rosenblum J., Linden K., and Ryan J.N., 2016. Identification of polypropylene glycols and polyethylene glycol carboxylates in wastewater from hydraulic fracturing. *Journal of Hazardous Materials*, in press, February 2016.
- Mohanty S.K., Saiers J.E., and Ryan J.N., 2016. Colloid mobilization in a fractured soil: Effect of pore water exchange between preferential flow paths and soil matrix. *Environmental Science & Technology*, accepted, doi:10.1021/acs.est.5b04767.
- Manceau A., Lemouchi C., Enescu M., Gaillot A.-C., Lanson M., Magnin V., Glatzel P., Poulin B.A., Ryan J.N., Aiken G.R., Gautier-Luneau I., and Nagy K.L., 2015. Formation of mercury sulfide from Hg(II)-thiolate complexes in natural organic matter. *Environmental Science & Technology* **49**, 9787-9796.
- Mohanty S.K., Saiers J.E., and Ryan J.N., 2015. Colloid mobilization in a fractured soil during dry-wet cycles: Role of drying duration and flow path permeability. *Environmental Science & Technology* **49**(15), 9100-9106.
- Poulin B.A., Aiken G.R., Nagy K.L., Manceau A., Krabbenhoft D.P., and Ryan J.N., 2015. Mercury transformation and release differs with depth and time in a contaminated riparian soil during simulated flooding. *Geochimica et Cosmochimica Acta* **176**, 118-138.
- Rogers J.D., Burke T.L., Osborn S.G., and Ryan J.N., 2015. A framework for identifying organic compounds of concern in hydraulic fracturing fluids based on mobility and persistence in groundwater. *Environmental Science & Technology Letters* **2**, 158-164.
- Webster J.P., Kane T.J., Obrist D., Ryan J.N., and Aiken G.R., 2015. Estimating mercury emissions resulting from wildfire in the western United States. *Science of the Total Environment*, in press.
- Mohanty S.K., Bulicek M.C.D., Metge D.W., Harvey R.W., Ryan J.N., and Boehm A.B., 2014. Mobilization of microspheres from a fractured soil during intermittent infiltration events. *Vadose Zone Journal* **14**(1), doi:10.2136/vzj2014.05.0058.
- Mohanty S.K., Saiers J.E., and Ryan J.N., 2014. Colloid-facilitated mobilization of metals by freeze-thaw cycles. *Environmental Science & Technology* **48**, 977-984.
- Poulin B.A., Ryan J.N., and Aiken G.R., 2014. The effects of iron on optical properties of dissolved organic matter. *Environmental Science & Technology* **48**, 10098-10106.
- Bielefeldt A.R., Stewart M.W., Mansfield E., Summers R.S., and Ryan J.N., 2013. Effects of chlorine and other water quality parameters on the release of silver nanoparticles from a ceramic surface. *Water Research* **47**(12), 4032-4039.
- Landkamer L.L., Harvey R.W., Scheibe T.D., and Ryan J.N., 2013. Colloid transport in saturated porous media: Elimination of attachment efficiency in a new colloid transport model. *Water Resources Research* **49**(5), 2952-2965, doi:10.1002/wrcr.20195.
- Writer J.H., Antweiler R.C., Ferrer I., Ryan J.N., and Thurman E.M., 2013. In-stream attenuation of neuro-active pharmaceuticals and their metabolites. *Environmental Science & Technology* **47**(17), 9781-9790, doi:10.1021/es402158t.
- Craven A.M., Aiken G.R., and Ryan J.N., 2012. Copper(II) binding by dissolved organic matter: Importance of the copper-to-dissolved organic matter ratio and implications for the biotic ligand model. *Environmental Science & Technology* **46**(18), 9948-9955.
- McCleskey R.B., Nordstrom D.K., and Ryan J.N., 2012. Comparison of electrical conductivity calculation methods for natural waters. *Limnology and Oceanography: Methods* **10**, 952-967.
- McCleskey R.B., Nordstrom D.K., Ryan J.N., and Ball J.W., 2012. A new method of calculating electrical conductivity with applications to natural waters. *Geochimica et Cosmochimica Acta* **77**, 369-382.
- Mohanram A., Ray C., Metge D.W., Harvey R.W., Barber L.B., Ryan J.N., and Harvey R.W., 2012. Effect of dissolved organic carbon on the transport and attachment behaviors of *Cryptosporidium parvum* oocysts

- and carboxylate-modified microspheres advected through temperate humic and tropical volcanic agricultural soil. *Environmental Science & Technology* **46**, 2088-2094.
- Writer J.H., Ryan J.N., Keefe S.H., and Barber L.B., 2012. Fate of 4-nonylphenol and 17 β -estradiol in the Redwood River of Minnesota. *Environmental Science & Technology* **46**, 860-868.
- Aiken G.R., Hsu-Kim H., and Ryan J.N., 2011. Influence of dissolved organic matter on the environmental fate of metals, nanoparticles, and colloids. *Environmental Science & Technology* **45**, 3196-3201.
- Deonaraine A., Lau B., Aiken G., Ryan J.N., and Hsu-Kim H., 2011. Effects of humic substances on precipitation and aggregation of zinc sulfide nanoparticles. *Environmental Science & Technology* **45**, 3217-3223.
- Gerbig C.A., Kim C.S., Stegemeier J.P., Ryan J.N., and Aiken G.R., 2011. Formation of nanocolloidal metacinnabar in mercury-DOM-sulfide environmental systems. *Environmental Science & Technology* **45**, 9180-9187.
- McCleskey R.B., Nordstrom D.K., and Ryan J.N., 2011. Electrical conductivity method for natural waters. *Applied Geochemistry* **26**, S227-S229.
- Nagy K.L., Manceau A., Gasper J.D., Ryan J.N., and Aiken G.R., 2011. Metallothionein-like multinuclear clusters of mercury(II) and sulfur in peat. *Environmental Science & Technology* **45**, 7298-7306.
- Writer J.H., Ryan J.N., and Barber L.B., 2011. Role of biofilms in sorptive removal of steroidal hormones and 4-nonylphenol compounds from streams. *Environmental Science & Technology* **45**, 7275-7283.
- Writer J.H., Barber L.B., Ryan J.N., and Bradley, P.M., 2011. Attenuation and transformation of steroidal hormones and alkylphenols by stream biofilms. *Environmental Science & Technology* **45**, 4370-4376.
- Abudalo R.A., Ryan J.N., Harvey R.W., Metge D.W., and Landkamer L., 2010. Influence of organic matter on the transport of *Cryptosporidium parvum* oocysts in a ferric oxyhydroxide-coated quartz sand saturated porous medium. *Water Research* **44**, 1104-1113.
- Mohanram A., Ray C., Harvey R.W., Metge D.W., Ryan J.N., Chorover J., and Eberl D.D., 2010. Comparison of transport and attachment behaviors of *Cryptosporidium parvum* oocysts and oocyst-sized microspheres being advected through three mineralogically different granular porous media. *Water Research* **44**, 5334-5344.
- Pang L., Nowostawska U., Ryan J.N., Williamson W.M., Walshe G., and Hunter K.A., 2009. Modifying the surface charge of pathogen-sized microspheres for studying pathogen transport in groundwater. *Journal of Environmental Quality* **38**, 2210-2217.
- Harvey R.W., Metge D.W., Shapiro A.M., Renken R.A., Osborn C.L., Ryan J.N., Cunningham K.J., and Landkamer L., 2008. Pathogen and chemical transport in the karst limestone of the Biscayne Aquifer: 3. Use of microspheres to estimate the transport potential of *Cryptosporidium parvum* oocysts. *Water Resources Research* **44**, W08431, doi: 10.1029/2007WR006060.
- Gasper J.D., Aiken G.R., and Ryan J.N., 2007. A critical review of methods used for the measurement of mercury (Hg²⁺)-dissolved organic matter stability constants. *Applied Geochemistry* **22**, 1583-1597.
- Gao B., Saiers J.E., and Ryan J.N., 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 Ryan J.N., 2006. Introduction to special section on Colloid Transport in Subsurface Environments. *Water Resources Research* **42**, W12S01, doi:10.1029/2006WR005620.
- Turner N.B., Ryan J.N., and Saiers J.E., 2006. The effect of desorption kinetics on colloid-facilitated transport: Cesium, strontium, and illite colloids. *Water Resources Research* **42**, W12S09, doi:10.1029/2006WR004972.
- Abudalo R.A., Bogatsu Y.G., Ryan J.N., Harvey R.W., Metge D.W., and Elimelech M., 2005. The effect of ferric oxyhydroxide grain coatings on the transport of bacteriophage PRD1 and *Cryptosporidium parvum* oocysts in saturated porous media. *Environmental Science & Technology* **39**, 6412-6419.
- Renken R.A., Cunningham K.J., Zygnerski M.R., Wacker M.A., Shapiro A.M., Harvey R.W., Metge D.W., Osborn C.L., and Ryan J.N., 2005. Assessing the vulnerability of a municipal well field to contamination in a karst aquifer. *Environmental & Engineering Geoscience* **11**, 319-331.
- Saiers, J.E., and Ryan, J.N., 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:10.1029/2005GL24343.

- Waples J.S., Nagy K.L., Aiken G.R., and Ryan J.N., 2005. Dissolution of cinnabar (HgS) in the presence of natural organic matter. *Geochimica et Cosmochimica Acta* **69**, 1575-1588.
- DeNovio N.M., Saiers J.E., and Ryan J.N., 2004. Colloid movement in unsaturated porous media: Recent advances and future directions. *Vadose Zone Journal* **3**, 338-351.
- Gao B., Saiers J.E., and Ryan J.N., 2004. Influence of pH on the deposition and mobilization of clay colloids in unsaturated porous media. *Water Resources Research* **40**, doi:10.1029/2004WR003189.
- Harvey R.W. and Ryan J.N., 2004. PRD1 bacteriophage in groundwater viral transport, inactivation, and attachment studies. *FEMS Microbiology Ecology* **49**, 3-16.
- Keefe S.H., Barber L.B., Runkel R.L., and Ryan J.N., 2004. Fate of volatile organic compounds in a constructed wastewater treatment wetland. *Environmental Science & Technology* **38**, 2209-2216.
- Keefe S.H., Barber L.B., Runkel R.L., Ryan J.N., McKnight D.M., and Wass R., 2004. Conservative and reactive solute transport in constructed wetlands. *Water Resources Research* **40**, doi:10.1029/2003WR002130.
- Tufenkji N., Miller G.F., Ryan J.N., Harvey R.W., and Elimelech M., 2004. Transport of *Cryptosporidium* oocysts in porous media: Role of straining and physicochemical filtration. *Environmental Science & Technology* **38**, 5932-5938.
- Aiken G.R., Haitzer M., Ryan J.N., and Nagy K., 2003. Interactions between dissolved organic matter and mercury in the Florida Everglades. *Journal de Physique IV* **107**, 29-32.
- Haitzer M., Aiken G.R., and Ryan J.N., 2003. Binding of mercury(II) to aquatic humic substances: Influence of pH and source of humic substances. *Environmental Science & Technology* **37**, 2436-2441.
- Loveland J.P., Bhattacharjee S., Ryan J.N., and Elimelech M., 2003. Colloid transport in a geochemically heterogeneous porous medium: Aquifer tank experiment and modeling. *Journal of Contaminant Hydrology* **65**, 161-182.
- Bhattacharjee S., Ryan J.N., and Elimelech M., 2002. Virus transport in physically and geochemically heterogeneous subsurface porous media. *Journal of Contaminant Hydrology* **57**, 161-187.
- Bunn R.A., Magelky R.D., Ryan J.N., and Elimelech M., 2002. Mobilization of natural colloids from an iron oxide-coated sand aquifer: Effect of pH and ionic strength. James J. Morgan Special Commemorative Issue, *Environmental Science & Technology* **36**, 314-322.
- Drexel R.T., Haitzer M., Ryan J.N., Aiken G.R., and Nagy K.L., 2002. Mercury(II) binding to two Florida Everglades peats: Evidence for strong binding and competition with dissolved organic matter released from the peat. *Environmental Science & Technology* **36**, 4058-4064.
- Haitzer M., Aiken G.R., and Ryan J.N., 2002. Binding of mercury(II) to dissolved organic matter: The role of mercury-to-DOM concentration ratio. *Environmental Science & Technology* **36**, 3564-3570.
- Ryan J.N., Harvey R.W., Metge D., Elimelech M., Navigato T.N., and Pieper A.P., 2002. Field and laboratory investigations of inactivation of viruses (PRD1 and MS2) attached to iron oxide-coated quartz sand. *Environmental Science & Technology* **36**, 2403-2413.
- Tufenkji N., Ryan J.N., and Elimelech M., 2002. The promise of bank filtration. *Environmental Science & Technology* **36**, A422-A428.
- Abadzic S.A. and Ryan J.N., 2001. Particle release and permeability reduction in a natural zeolite (clinoptilolite) porous medium. *Environmental Science & Technology* **35**, 4502-4508.
- Sueker J.K., Clow D.W., Ryan J.N., and Jarrett R.D., 2001. Effect of basin physical characteristics on solute fluxes in nine alpine/subalpine basins, Colorado, USA. *Hydrologic Processes* **15**, 2759-2769.
- Sun N., Elimelech M., Sun N.-Z., and Ryan J.N., 2001. A two-dimensional model of colloid transport in physically and geochemically heterogeneous porous media. *Journal of Contaminant Hydrology* **49**, 173-199.
- Sun N., Elimelech M., Sun N.-Z., and Ryan J.N., 2001. Sensitivity analysis and parameter identifiability in colloid transport in geochemically heterogeneous porous media. *Water Resources Research* **37**, 209-222.
- Elimelech M., Nagai M., Ko C.-H., and Ryan J.N., 2000. The relative insignificance of mineral grain zeta potential to colloid transport in geochemically heterogeneous porous media. *Environmental Science & Technology* **34**, 2143-2148.
- Ryan J.N., Elimelech M., Baeseman J.L., and Magelky R.D., 2000. Silica-coated titania and zirconia colloids for subsurface transport field experiments. *Environmental Science & Technology* **34**, 2000-2005.
- Siddiqui M., Amy G., Ryan J., and Oden W., 2000. Membranes for the control of natural organic matter from surface waters. *Water Research* **34**, 3355-3370.

- Sueker J.K., Ryan J.N., Kendall C., and Jarrett R.D., 2000. Determination of hydrologic pathways during snowmelt for alpine/subalpine basins, Rocky Mountain National Park, Colorado. *Water Resources Research* **36**, 63-75.
- Ravichandran M., Aiken G.R., Ryan J.N. and Reddy M.M., 1999. Inhibition of precipitation and aggregation of metacinnabar (mercuric sulfide) by dissolved organic matter isolated from the Florida Everglades. *Environmental Science & Technology* **33**, 1418-1423.
- Ryan J.N., Elimelech M., Ard R.A., Harvey R.W., and Johnson P.R., 1999. Bacteriophage PRD1 and silica colloid transport and recovery in an iron oxide-coated sand aquifer. *Environmental Science & Technology* **33**, 63-73.
- Ravichandran M., Aiken G.R., Reddy M.M., and Ryan J.N., 1998. Enhanced dissolution of cinnabar (mercuric sulfide) by aquatic humic substances. *Environmental Science & Technology* **32**, 3305-3311.
- Ryan J.N., Illangasekare T.H., Litaor M.I., and Shannon R., 1998. Particle and plutonium mobilization in a macroporous soil during rainfall simulations. *Environmental Science & Technology* **32**, 476-482.
- Pieper A.P., Ryan J.N., Amy G.L., Illangasekare T.H., Harvey R.W., and Metge D.W., 1997. Transport of bacteriophage PRD1 through an unconfined sand aquifer: Effect of sewage-derived organic matter. *Environmental Science & Technology* **31**, 1163-1170.
- Edwards M., Benjamin M.M., and Ryan J.N., 1996. Role of organic matter acidity in sorption of natural organic matter (NOM) to oxide surfaces. *Colloids and Surfaces A. Physicochemical and Engineering Aspects* **107**, 297-308.
- Loveland J.P., Ryan J.N., Amy G.L., and Harvey R.W., 1996. The reversibility of virus attachment to mineral surfaces. *Colloids and Surfaces A. Physicochemical and Engineering Aspects* **107**, 205-222.
- Ryan J.N. and Elimelech M., 1996. Colloid mobilization and transport in groundwater. *Colloids and Surfaces A. Physicochemical and Engineering Aspects* **107**, 1-56.
- Ryan J.N. and Gschwend P.M., 1994. Effect of solution chemistry on the detachment of clay colloids from an iron oxide-coated sand. *Environmental Science & Technology* **28**, 1717-1726.
- Ryan J.N. and Gschwend P.M., 1994. Effect of ionic strength and flow rate on colloid detachment kinetics: Dependence on intersurface potential energy. *Journal of Colloid and Interface Science* **164**, 21-34.
- Backhus D.A., Ryan J.N., Groher D., MacFarlane J.K., and Gschwend P.M., 1993. Sampling colloids and colloid-associated contaminants in ground water. *Ground Water* **31**, 466-479.
- Ryan J.N. and Gschwend P.M., 1992. Effect of iron diagenesis on the transport of clay colloids in an unconfined sand aquifer. *Geochimica et Cosmochimica Acta* **56**, 1507-1522.
- Ryan J.N. and Gschwend P.M., 1991. Extraction of iron oxides from sediments using reductive dissolution by titanium(III). *Clays and Clay Minerals* **39**, 509-518.
- Ryan J.N. and Gschwend P.M., 1990. Groundwater colloids in two Atlantic Coastal Plain aquifers: Field studies. *Water Resources Research* **26**, 307-322.
- Maest A.S., Stallard R.F., Crerar D.A., and Ryan J.N., 1990. Trace metal and nutrient behavior in a polluted estuary with multiple freshwater sources. *Chemical Geology* **81**, 133-149.

REFEREED REPORTS AND REPORT CHAPTERS

- Ryan J.N., Aiken G.R., Backhus D.A., Villholth K.G., and Hawley C.M., 1999. Investigating the potential for colloid- and organic matter-facilitated transport of polycyclic aromatic hydrocarbons in crude-oil contaminated ground water. In *U.S. Geological Survey Toxic Substances Hydrology Program – Proceedings of the Technical Meeting, Charleston, South Carolina, March 8-12, 1999 – Volume 3 of 3 – Subsurface Contamination from Point Sources* (eds. D.W. Morgenwalp and H.T. Buxton), U.S. Geological Survey Water-Resources Investigation Report 99-4018C, 211-222.
- Ryan J.N., Elimelech M., Ard R.A., and Magelky R.D., 1999. Mobilization and transport of natural and synthetic colloids and a virus in an iron oxide-coated sewage-contaminated aquifer. In *U.S. Geological Survey Toxic Substances Hydrology Program – Proceedings of the Technical Meeting, Charleston, South Carolina, March 8-12, 1999 – Volume 3 of 3 – Subsurface Contamination from Point Sources* (eds. D.W. Morgenwalp and H.T. Buxton), U.S. Geological Survey Water-Resources Investigation Report 99-4018C, 411-422.
- Metge D.W., Navigato T., Larson J.E., Ryan J.N., and Harvey R.W., 1999. Dual-isotope labeling to monitor virus transport and identifying factors affecting viral inactivation in contaminated aquifer sediments from Cape Cod, Massachusetts. In *U.S. Geological Survey Toxic Substances Hydrology Program – Proceedings of the Technical Meeting, Charleston, South Carolina, March 8-12, 1999 – Volume 3 of 3 – Subsurface Contamination from Point Sources* (eds. D.W. Morgenwalp and H.T. Buxton), U.S. Geological Survey Water-Resources Investigation Report 99-4018C, 423-430.

- Ryan J.N., Ard R.A., Magelky R.D., Elimelech M., Sun N., and Sun N.-Z., 1999. Colloid mobilization and transport in contaminant plumes: Field experiments, laboratory experiments, and modeling. U.S. Environmental Protection Agency Report No. EPA/600/S-99/001, 38 pp.
- Yang I.C., Yu P., Rattray G.W., Ferese J.S., and Ryan J.N., 1998. Hydrochemical investigations in characterizing the unsaturated zone at Yucca Mountain, Nevada. Water-Resources Investigation 98-4132, U.S. Geological Survey, Denver, Colorado, 57 pp.
- Ryan J.N., Mangion S., and Willey D., 1995. Turbidity and Colloid Transport. In *Ground Water Sampling -- A Workshop Summary*, Dallas, Texas, November 30 to December 2, 1993, U.S. Environmental Protection Agency Rep. No. EPA/600/R-94/205, 88-93.
- Backhus D.A., Ryan J.N., Groher D.M., MacFarlane J.K., and Gschwend P.M., 1995. Sampling colloids and colloid-associated contaminants in ground water. In *Ground Water Sampling -- A Workshop Summary*, Dallas, Texas, November 30 to December 2, 1993, U.S. Environmental Protection Agency Rep. No. EPA/600/R-94/205, 21-25.

REPORTS AND REPORT CHAPTERS

- Ryan J.N., Bevan H., Dodge C., and Norvell A., 2009. *Sources of Metal Contamination in the Coal Creek Watershed, Crested Butte, Gunnison County, Colorado: Part III. Early Spring Flow, April 2007*. Report 09-02, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 49 pp.
- Ryan J.N. and Bevan H., 2009. *Sources of Metal Contamination in the Coal Creek Watershed, Crested Butte, Gunnison County, Colorado: Part II. High Flow, June 2006*. Report 09-01, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 67 pp.
- Bautts S., Lheritier I., and Ryan J.N., 2006. *Assessment of Metal Contamination of Benthic Macroinvertebrates in the Lefthand Creek Watershed, Northwestern Boulder County, Colorado, 2005*. Report 06-01, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 78 pp.
- Shanklin B. and Ryan J.N., 2006. *Sources of Metal Contamination in the Coal Creek Watershed, Crested Butte, Gunnison County, Colorado: Part I. Low Flow, September 2005*. Report 06-02, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 92 pp.
- Limerick P.N., Ryan J.N., Brown T.R., and Comp T.A., 2005. *Cleaning Up Abandoned Hardrock Mines in the West: Prospecting for a Better Future*. Report from the Center #7, Center of the American West, University of Colorado at Boulder, 47 pp.
- Harvey R.W., Shapiro A.M., Renken R.A., Metge D.W., Ryan J.N., Osborn C.L., and Cunningham K.J., 2005. Transport potential of *Cryptosporidium parvum* oocysts in a drinking-water, karstic-limestone aquifer: What we have learned using oocyst-sized microspheres in a 100-m convergent tracer test at Miami's Northwest Well Field. In *U.S. Geological Survey Karst Interest Group Proceedings, Rapid City, South Dakota, September 12-15, 2005*. Scientific Investigations Report 2005-5160, U.S. Geological Survey, Reston, Virginia, 154-155.
- Wood A.R., Cholas R., Harrington L., Isenhardt L., Turner N., and Ryan J.N., 2004. *Characterization and Prioritization of Mining-Related Metal Sources in the Streams and Streambed Sediments of the Lefthand Creek Watershed, Northwestern Boulder County, Colorado*. Report 04-01, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, prepared for the Left Hand Watershed Oversight Group, Niwot, Colorado.
- Ryan J.N. and Duren S., 2003. *The Effects of a Forest Road and Off-Road Vehicle Use on the Generation of Suspended Sediment in a Mountain Stream Used for Water Supply*. Report 03-01, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, prepared for the James Creek Watershed Initiative, Jamestown, Colorado.
- Ryan J.N., Elimelech M., Harvey R.W., Aronheim J.S., Bhattacharjee S., Bogatsu Y., Loveland J.P., Metge D.W., Navigato T., and Pieper A.P., 2002. Transport of viruses in porous media. In *Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments*, de Jonge L.W., Moldrup P., and Jacobsen O.H., eds., Danish Institute of Agricultural Sciences, Plant Production Report No. 80, Tjele, Denmark, 93-99.
- DeNovio, N.M. and Ryan J.N., 2002. Colloid mobilization in simplified soil columns under unsaturated conditions. In *Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments*, de Jonge L.W., Moldrup P., and Jacobsen O.H., eds., Danish Institute of Agricultural Sciences, Plant Production Report No. 80, Tjele, Denmark, 143-148.

CONFERENCE PROCEEDINGS

- Ryan J.N. and Edwards M. (editors), 1994. *Critical Issues in Water and Wastewater Treatment*. Proceedings of the 1994 National Environmental Engineering Conference, Boulder, Colorado, July 11-13, American Society of Civil Engineering, New York, 812 pp.

BOOK CHAPTERS

- Gerbig C.A., Ryan J.N., and Aiken G.R., 2012. The effects of dissolved organic matter on mercury biogeochemistry. In *Environmental Chemistry and Toxicology of Mercury* (Cai Y., Liu G., and O'Driscoll N., eds.), John Wiley and Sons, New York, pp. 259-292.
- Ryan J.N., 2009. Cleaning up abandoned hard-rock mines in the western United States: *Can and will* communities take the lead? In *Remedies for a New West: Healing Landscapes, Histories, and Cultures* (Limerick P.N., Cowell A., and Collinge S.K., eds.), University of Arizona Press, Tucson, Arizona, pp. 173-192.
- Elimelech M. and Ryan J.N., 2002. The role of mineral colloids in the facilitated transport of contaminants in saturated porous media. In *Interactions of Soil Particles and Microorganisms and Their Impact on the Terrestrial Environment* (Huang P.M., Bollag, J.-M., and Senesi N., eds.), Vol. 8, IUPAC Series of Analytical and Physical Chemistry of Environmental Systems, John Wiley & Sons, New York, 495-548.
- S. Bhattacharjee, M. Elimelech, and J.N. Ryan, 1999. A model for virus transport in heterogeneous porous media. In *Hazardous and Industrial Wastes* (Nikolaïdis N., Erkey C., and Smets B.F., eds.), Technomic Publishing, Lancaster, Pennsylvania, pp. 397-406.

Gschwend P.M., Holmén B.A., MacKay A.A., Ryan J.N., Backhus D.A., and Chin Y.-P., 1994. Overview: Processes limiting the occurrence of organic contaminants in moving groundwater. In *Transport and Reactive Processes in Aquifers* (Dracos Th. and Stauffer F., eds.), Balkema, Rotterdam, 11-18.

CONFERENCE PRESENTATIONS AND ABSTRACTS

- Mohanty S.K., Dittrich T.M., Saiers J.E., and Ryan J.N., 2016. Subsurface release of cesium and strontium: Relative contribution of colloids, natural organic matter, and major cations. To be presented at the 252nd ACS National Meeting, August 21-25, 2016, Philadelphia, Pennsylvania.
- Armstrong K.J., Roger J.D., Burke T.L., and Ryan J.N., 2016. Occurrence of BTEX from oil- and gas-related incidents in groundwater above the Denver-Julesburg Basin. Presented at the Groundwater Protection Council Underground Injection Control Conference, February 23-25, 2016, Denver, Colorado.
- Lackey G., Rajaram H., Sherwood O.A., Burke T.L., and Ryan J.N., 2016. The occurrence of surface casing pressure in the Denver-Julesburg Basin and implications for stray gas migration. Presented at the Groundwater Protection Council Underground Injection Control Conference, February 23-25, 2016, Denver, Colorado.
- Sherwood O.A., Rogers J.D., Lackey G.D., Burke T.L., Osborn S.G., and Ryan J.N., 2016. Sources of groundwater methane in the Denver-Julesburg Basin of Colorado. Presented at the Ground Water Protection Council Underground Injection Control Annual Conference, Denver, Colorado, February 23-25, 2016.
- Entrekin S., Bradley A., Fargione J., Kiesecker J., Saiers J., Ryan J., Trainor A., and Evans-White, M., 2015. Season and region-specific environmental conditions can mediate stream risk from activities associated with high volume hydraulic fracturing. To be presented at the Society of Environmental Toxicology and Chemistry North America Focused Topic Meeting on Environmental Quality Implications of Unconventional Natural Gas Development, Denton, Texas, March 17-19, 2016.
- Poulin B.A., Ryan J.N., Nagy K.L., Stubbins A., Dittmar T., and Aiken G.R., 2016. Abiotic addition of sulfide to dissolved organic matter. To be presented at the Association for the Sciences of Limnology and Oceanography, New Orleans, Louisiana, February 21-26, 2016.
- Rogers J.D. and Ryan J.N., 2016. Inhibition of biodegradation of hydraulic fracturing fluid organic compounds in groundwater by the biocide glutaraldehyde. Presented at the 251st American Chemical Society National Meeting, San Diego, California, March 13-17, 2016.
- Oikonomou P.D., Waskom R.M., Boone K.K., and Ryan J.N., 2015. Unconventional oil and gas development and its stresses on water resources in the context of water-energy-food nexus: The case of Weld County, Colorado. Presented at the 2015 American Geophysical Union Fall Meeting, San Francisco, California, December 16, 2015.
- Alongi M., Howard C., Kasprzyk J., and Ryan J., 2015. Toward a multi-objective decision support framework to support regulations of unconventional oil and gas development. Presented at the American Geophysical Union National Meeting, San Francisco, California, December 16, 2015.
- Oikonomou P.D., Waskom R.M., Boone K.K., Kallenberger J.A., Plombon B.N., and Ryan J.N., 2015. Water use vulnerabilities and impacts of oil and gas development in Colorado. Presented at the 2015 American Water Resources Association Annual Conference, Denver, Colorado, November 16-19, 2015.
- Kasprzyk J.R. and Ryan J.N., 2015. Tradeoff analysis of setback distance and density for oil and natural gas development. Presented at the 2015 American Water Resources Association Annual Conference, Denver, Colorado, November 16-19, 2015.
- Poulin B.A., Ryan J.N., Stubbins A., and Aiken G.R., 2015. Abiotic addition of sulfide to dissolved organic matter. Presented at the American Chemical Society National Meeting, Denver, Colorado, March 22-26, 2015.
- Rogers J.D., Osborn S., and Ryan J.N., 2014. Fate and transport of four organic compounds frequently used in hydraulic fracturing fluids in laboratory columns containing aquifer sediments. Presented at the American Chemical Society National Meeting, Denver, Colorado, March 22-26, 2015.
- Waskom R., Kallenberger J., Boone K., Plombon B., and Ryan J.N., 2014. Water sources and quantity for energy development in Colorado's Denver Julesburg Basin. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 15-19, 2014.
- Rogers J.D., Sherwood O., Lackey G., Burke T., Osborn S., and Ryan J.N., 2014. Identification and occurrence of methane in groundwater wells of the Denver-Julesburg and Piceance basins of Colorado. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 15-19, 2014.
- Webster J.P., Ryan J.N., and Aiken G.R., 2014. Fate and transport of mercury in a watershed-reservoir system burned during the 2012 Hewlett Gulch Fire, Ft. Collins, Colorado. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 15-19, 2014.
- Kallenberger J., Boone K., Plombon B., Waskom R., and Ryan J., 2014. Water for energy development in Colorado's Denver-Julesburg Basin. Presented at the South Platte River Forum, Denver, Colorado, October 24, 2014.
- Rogers J.D., Osborn S.G., and Ryan J.N., 2014. Fate and transport of four organic compounds frequently used in hydraulic fracturing fluids in laboratory columns containing aquifer sediments. Presented at the Geological Society of America Annual Meeting, Vancouver, British Columbia, October 19-22, 2014.
- Sherwood O.A., Rogers J.D., Lackey G.D., Burke T.L., Osborn S.G., and Ryan J.N., 2014. Identification and occurrence of thermogenic stray gas in groundwater wells of the Denver-Julesburg and Piceance basins of Colorado. Presented at the Geological Society of America Annual Meeting, Vancouver, British Columbia, October 19-22, 2014.
- Ryan J.N., Dehart J., Reumann-Moore K., and Osborn S., 2014. Groundwater quality in the vicinity of oil and gas development in the Denver-Julesburg Basin. Presented at the National Ground Water Association Summit, Denver, Colorado, May 4-7, 2014.
- Webster J.P., Aiken G.R., Ryan J.N., Nagy K., Manceau A., and Callagon E., 2013. Fate and transport of mercury in a watershed-reservoir system burned during the 2012 Hewlett Gulch fire, Fort Collins, Colorado. Presented at the 125th Annual Meeting of the Geological Society of America, Denver, Colorado, October 27-30, 2013.

- Coleman A.N., Runkel R.L., Ren J., McKnight D.M., and Ryan J.N., 2013. Transport and hyporheic exchange of iron oxide colloids in a stream affected by acid mine drainage. Presented at the 125th Annual Meeting of the Geological Society of America, Denver, Colorado, October 27-30, 2013.
- Dehart J.N., Osborn S.G., and Ryan J.N., 2013. Transport of selected hydraulic fracturing fluid organic compounds through aquifer sediment in laboratory columns. Presented at the 246th American Chemical Science National Meeting, Indianapolis, Indiana, September 8-12, 2013.
- Poulin B.A., Aiken G.R., Ryan J.N., Manceau A., and Nagy K.L., 2013. Mercury transformation and release dynamics under saturation conditions in contaminated riparian soils. Presented at the 11th International Conference on Mercury as a Global Pollutant, July 28-August 2, 2013.
- Webster J.P., Ryan J.N., and Aiken G.R., 2013. The effect of historical and recent wildfires on soil-mercury distribution and mobilization at Mesa Verde National Park, Colorado, USA. Presented at the 11th International Conference on Mercury as a Global Pollutant, July 28-August 2, 2013.
- Writer J.H., Murphy S.F., Antweiler R.C., Ferrer I., Thurman M.E., and Ryan J.N., 2012. Fate and transport of anti-depressant compounds and associated metabolites in rivers. Presented at the American Water Resources Association 2012 Summer Specialty Conference, Contaminants of Emerging Concern in Water Resources II: Research, Engineering and Community Action, Denver, Colorado, June 25-27, 2012.
- Poulin B.A., Aiken G.R., Ryan J.N., and Nagy K.N., 2012. Dynamics of mercury release in flooded soils from Oak Ridge, Tennessee. Presented at the U.S. Department of Energy Subsurface Biogeochemical Research Annual Meeting, Washington, DC, April 29-May 1, 2012.
- Mohanty S.K., Bulicek M., Metge D.W., Harvey R.W., Boehm A.B., and Ryan J.N., 2012. Microsphere transport in a fractured soil during intermittent flow: Effect of microsphere sizes and soil physical heterogeneity. Presented at the American Geophysical Union Meeting, San Francisco, California, December, 2012.
- Webster J.P., Ryan J.N., and Aiken G.R., 2012. Does wild fire affect mercury mobilization, transport, and fate in aquatic environments? Four Corners Air Quality Forum, Mountain Studies Institute, Durango, Colorado, May 23, 2012.
- Mohanty S.K., Ryan J.N., and Saiers J.E., 2011. Enhanced transport of colloid and metal cations by freeze-thaw cycles. Presented at the American Geophysical Union Meeting, San Francisco, California, December 2011.
- Peltz C.D., Nydick K., Wright W., Ryan J., and Webster J., 2011. Fate and transport of mercury in the Four Corners area of Southern Colorado. Presented at the American Geophysical Union Meeting, San Francisco, California, December 2011.
- Craven A.M., Aiken G.R., and Ryan J.N., 2011. The effect of dissolved organic matter on the release of trace elements from coal ash in natural surface waters. Presented at the Geological Society of America Meeting, Minneapolis, Minnesota, October 2011.
- Mohanty S.K., Ryan J.N., and Saiers J.E., 2011. Mobilization of colloids and metals from intact cores of a fractured soil: Role of pore water exchange. Presented at the Soil Science Society of America National Meeting, San Antonio, Texas, October 2011.
- Dittrich T.M., Ryan J.N., and Saiers J.E., 2011. Role of desorption kinetics on colloid-facilitated transport of cesium and strontium. Presented at the American Chemical Society National Meeting, Denver, Colorado, August 2011.
- Webster J.P., Kamark B.L., Ottenfeldt C.F., Ryan J.N., Aiken G.R., Nagy K.L., Nano G., Manceau A., 2011. Changes in the binding of mercury to forest soils following natural and prescribed fire and furnace heating. Presented at the American Chemical Society National Meeting, Denver, Colorado, August 2011.
- Craven A.M., Ryan J.N., and Aiken G.R., 2011. The effect of dissolved organic matter on the release of trace elements from coal ash in natural surface waters. Presented at the American Chemical Society National Meeting, Denver, Colorado, August 2011.
- Writer J.H., Ryan J.N., and Barber L.B., 2011. Fate of 17 β -estradiol and 4-nonylphenol in the Redwood River of Minnesota. Presented at the American Chemical Society National Meeting, Denver, Colorado, August 2011.
- Mohanty S.K., Saiers J.E., and Ryan J.N., 2011. Mobilization of cesium and strontium in a vadose zone by cation exchange, organic matter, and colloids: A laboratory and field study. Presented at the American Chemical Society National Meeting, Denver, Colorado, August 2011.
- Gerbig C.A., Kim C.S., Stegemeier J.P., Ryan J.N., and Aiken G.R., 2011. The role of DOM, Hg:DOM ratio, sulfide concentration, and kinetics on the formation of metacinnabar-like particles in Hg-DOM-sulfide systems. Presented at the 10th International Conference on Mercury as a Global Pollutant, Halifax, Nova Scotia, Canada, July 2011.
- Poulin B.A., Aiken G.R., Ryan J.N., and Nagy K.L., 2011. Dynamics of mercury release in flooded soils from Oak Ridge, Tennessee. Presented at the 10th International Conference on Mercury as a Global Pollutant, Halifax, Nova Scotia, Canada, July 2011.
- McCleskey R.B., Nordstrom D.K., and Ryan J.N., 2011. Electrical conductivity method for natural waters. Presented at the Ninth International Symposium on the Geochemistry of the Earth's Surface, Boulder, Colorado, June 2011.
- Writer J.H., Keefe S.K., Ryan J.N., Ferrer I., Thurman M.E., and Barber L.B., 2011. Methods for evaluating in-stream attenuation of trace organic compounds. Presented at the Ninth International Symposium on the Geochemistry of the Earth's Surface, Boulder, Colorado, June 2011.
- Writer J.H., Bradley P.M., Ryan J.N., and Barber L.B., 2011. Transformation of steroidal hormones and alkylphenols by stream biofilms. Presented at the Association of Limnology and Oceanography – Aquatic Sciences Meeting, San Juan, Puerto Rico, February 2011.
- Mohanty S.K., Ryan J.N., and Saiers J.E., 2010. Hysteresis in the amount of colloids mobilized from intact cores of a fractured soil as a result of changes in the ionic strength of simulated rainfall. Presented at the American Geophysical Union Meeting, San Francisco, California, December 2011.
- Slowey A.J., Gerbig C., Aiken G.R., and Ryan J.N., 2010. Development of an electrochemical surrogate for copper, lead, and zinc bioaccessibility in aquatic sediments. Presented at SERDP Partners in Environmental Technology Technical Symposium & Workshop, November 30-December 2, 2010, Washington, District of Columbia.
- Craven A.M., Maest A.S., and Ryan J.N., 2010. Evaluation of copper-dissolved organic matter binding in surface waters at the proposed Pebble Mine in Alaska. Presented at the Geological Society of America Annual Meeting, Denver, Colorado, November 2010.
- McCleskey R.B., Nordstrom D.K., and Ryan J.N., 2010. Electrical conductivity: Theory and applications for natural waters. Presented at the Geological Society of America Annual Meeting, Denver, Colorado, November 2010.

- Stewart M.W., Bielefeldt A.R., Mansfield E., Summers R.S., Ryan J.N., 2010. Effects of water quality parameters on the release of silver nanoparticles from a ceramic surface using a quartz crystal microbalance. Presented at the 2010 Water Quality Technology Conference and Exposition of the American Water Works Association, Savannah, Georgia, November 2010, *Proceedings of the 2010 Water Quality Technology Conference and Exposition*.
- Writer J.H., Bradley P.M., Ryan J.N., and Barber L.B., 2010. The role of the epilithon in controlling the fate and transport of endocrine-active compounds in streams. Presented at the American Society of Limnology and Oceanography/North American Benthological Society Meeting, Santa Fe, New Mexico, June 2010.
- Norvell A.S., Ryan J.N., McKnight D.M., and Ren J., 2010. Metal and colloid transport in the hyporheic zone of an acid mine drainage-contaminated stream. Presented at the American Society of Limnology and Oceanography/North American Benthological Society Meeting, Santa Fe, New Mexico, June 2010.
- Conovitz A.R.W. and Ryan J.N., 2010. Collaborative efforts to characterize a watershed impacted by abandoned mines using metal loading tracer dilution tests: A case study for Left Hand Creek watershed, Colorado. Presented at the National Monitor Conference, Denver, Colorado, April 2010.
- Aiken G.R., Nagy K.L., and Ryan J.N., 2010. Challenges in the study of the interactions of metals with dissolved organic matter. Presented at the 239th Meeting of the American Chemical Society, San Francisco, California, March 2010.
- Deonarine A., Lau B., Hsu-Kim H., Aiken G.R., and Ryan J.N., 2010. Growth and aggregation of ZnS nanoparticles during coprecipitation with aquatic humic substances. Presented at the 239th Meeting of the American Chemical Society, San Francisco, California, March 2010.
- Mohanram A., Ray C., Harvey R.W., Metge D.W., Ryan J.N., and Chorover J., 2010. Effect of organic loading on the transport of *C. parvum* oocysts and oocyst-sized microspheres through variably- and permanently-charged soils. To be presented at the 239th Meeting of the American Chemical Society, San Francisco, California, March 2010.
- Norvell A.S., Ryan J.N., McKnight D.M., and Ren J., 2009. Metals and colloids in the hyporheic zone of an acid mine drainage-contaminated stream. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2009.
- Dittrich T.M., Ryan J.N., and Saiers J.E., 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. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2009.
- Nagy K.L., Manceau A., Ryan J.N., and Aiken G.R., 2009. Mercury(II)-sulfur binding in peat. Presented at the Goldschmidt Conference, Davos, Switzerland, May 2009.
- Mohanty S.K. and Ryan J.N., 2009. Effect of transient conditions on colloid- and organic matter-facilitated transport of radioactive cations in unsaturated soil. Presented at the American Water Resources Association Colorado Section Meeting, April 2009.
- Ryan J.N., Dittrich T.M., Mohanty S., and Saiers J.E., 2009. Role of desorption kinetics in colloid-facilitated transport of cesium and strontium in variably-saturated porous media. Presented at the U.S. Department of Energy Environmental Remediation and Science Program Annual Meeting, Washington, DC, April 2009.
- Saiers J.E., Cheng T., and Ryan J.N., 2009. Colloid and Cs-137 mobilization and transport in vadose-zone sediments under transient flow conditions. Presented at the U.S. Department of Energy Environmental Remediation and Science Program Annual Meeting, Washington, DC, April 2009.
- Nagy K.L., Manceau A., Ryan J.N., and Aiken G.R., 2008. Strong binding environments for mercury in peat. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2008.
- Gerbig C.A., Kim C.S., Moreau J.W., Aiken G.R., Nagy K.L., and Ryan J.N., 2008. Evidence for the presence of colloidal metacinnabar in Hg-DOM-sulfide systems as determined by a novel chromatographic-EXAFS method. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2008.
- Dittrich T.M. and Ryan J.N., 2008. Role of desorption kinetics and porous medium heterogeneity in colloid-facilitated transport of cesium and strontium: Preliminary results. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2008.
- Mohanram A., Ray C., Harvey R.W., Metge D.W., Chorover, J., Ryan J.N., and Barber L.B., 2008. Transport of *Cryptosporidium parvum* through variably and permanently charged soils. Presented at the 7th International Symposium for Subsurface Microbiology, Shizuoka, Japan, November, 2008.
- Slowey A.J., Gilbert B., Aiken G.R., and Ryan J.N., 2008. Sulfide-driven precipitation of cubic HgS nanoparticles in the presence of natural organic matter. Presented at the Geological Society of America Meeting, Houston, Texas, September 2008.
- Mohanram A., Ray C., Harvey R.W., Metge D.W., Ryan J.N., Barber L.B., and Chorover J., 2008. *Cryptosporidium parvum* transport through variably charged soils. Presented at the U.S. Department of Agriculture-Cooperative State Research, Education, and Extension Service National Water Conference, Reno, Nevada, February 2008.
- Nagy K.L., Manceau A., Gasper J., Ryan J.N., and Aiken G.R., 2007. New mechanisms of mercury binding to peat. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2007.
- Ryan J.N., Aiken G.R., Ravichandran M., and Gerbig C.A., 2007. Effects of natural organic matter on mercury(II) speciation: Inhibition of metacinnabar precipitation and nanocolloid formation. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2007.
- Gerbig C.A., Aiken G.R., and Ryan J.N., 2007. Competitive binding between mercury and copper for reduced sulfur binding sites on dissolved organic matter from the Florida Everglades. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2007.
- Suess E., Aiken G.R., Ryan J.N., and Gasper J.D., 2007. Mercury release from soils and sediments in the Sacramento River watershed. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2007.
- Mohanram A., Ray C., Harvey R.W., Metge D.W., Ryan J.N., Barber L.B., and Chorover J., 2007. Influence of metal oxide and soluble organic matter on *Cryptosporidium parvum* oocyst and oocyst surrogate mobility in variably charged soils. Presented at the *Water Environment Federation/American Water Works Association Student Conference, Rocky Mountain Region*, Boulder, Colorado, May 2007.

- Aiken G.R., Ryan J.N., and Nagy K.L., 2007. Challenges in the study of mercury-dissolved organic matter interactions. Presented at the 2007 American Society of Limnology & Oceanography Aquatic Sciences Meeting, Santa Fe, New Mexico, February 4-9, 2007.
- Ryan J.N., Turner N.B., and Saiers J.E., 2006. Colloids, contaminants, and surface chemistry: Effect of desorption kinetics on the facilitated transport of cesium and strontium by illite colloids. Presented at the 2006 Meeting of the American Institute of Chemical Engineering, San Francisco, CA, November 12-17, 2006.
- Ryan J.N., Turner N.B., and Saiers J.E., 2006. Colloid-facilitated transport of contaminants in porous media: Using cesium, strontium, and illite to illustrate the role of desorption kinetics. Presented at the 2006 Meeting of the Geological Society of America, Philadelphia, PA, October, 2006.
- Harvey R.W., Metge D.W., Shapiro A.M., Renken R.A., Osborn C.L., Ryan J.N., Cunningham K.J., and Landkamer, L., 2006. Use of microspheres to estimate the vulnerability of a sole-source, karstic-limestone aquifer to *Cryptosporidium parvum* oocysts in Southeastern Florida. Presented at the 2006 Meeting of the Geological Society of America, Philadelphia, PA, October, 2006.
- Ryan J.N., Aiken G.R., Nagy K.L., and Ravichandran M., 2006. Interactions of dissolved organic matter with mercuric sulfide (HgS): Inhibition of precipitation and stabilization of colloidal HgS. Presented at the 8th International Conference on Mercury as a Global Pollutant, Madison, WI, August 6-11, 2006.
- Nagy K.L., Aiken G.R., Ryan J.N., and Waples J., 2006. Dissolution of cinnabar in the presence of dissolved organic matter. Presented at the 8th International Conference on Mercury as a Global Pollutant, Madison, WI, August 6-11, 2006.
- Latch D.E., Aiken G.R., and Ryan J.N., 2006. The influence of dissolved organic matter on the photoreduction of mercury(II). Presented at the 8th International Conference on Mercury as a Global Pollutant, Madison, WI, August 6-11, 2006.
- Gasper J, Aiken G.R., and Ryan J.N., 2006. A critical review of methods used for the measurement of mercury(II)-dissolved organic matter stability constants. Presented at the 8th International Conference on Mercury as a Global Pollutant, Madison, WI, August 6-11, 2006.
- Saiers J.E., Gao B., Xu S., and Ryan J.N., 2005. Colloid mobilization and deposition in unsaturated porous media. Presented at the Geological Society of America National Meeting, Salt Lake City, Utah, October 16-19, 2005.
- Harvey R.W., Shapiro A.M., Renken R.A., Metge D.W., Ryan J.N., Osborn C.L., and Cunningham K.J., 2005. Transport potential of *Cryptosporidium parvum* oocysts in a drinking-water, karstic limestone aquifer: What we have learned using oocyst-sized microspheres in a 100-m convergent tracer test at Miami's Northwest Well Field. Presented at the U.S. Geological Survey Karst Interest Group Workshop, Rapid City, South Dakota, September 12-15, 2005.
- Renken R.A., Cunningham K.J., Shapiro A.M., Zygnerski M.R., Wacker M.A., Harvey R.W., Metge D.W., Osborn C.L., and Ryan J.N., 2005. Well head protection in an eogenetic karst aquifer: Can a municipal well field peacefully coexist with an Everglades extractive mining industry? To be presented at the U.S. Geological Survey Karst Interest Group Workshop, Rapid City, South Dakota, September 12-15, 2005.
- Nagy K.L., Waples J.S., Aiken G.R., and Ryan J.N., 2005. The influence of dissolved organic matter on cinnabar dissolution. Presented at the 15th V.M. Goldschmidt Conference, Moscow, Idaho, May 2005.
- Aiken G.R., Ryan J.N., and Nagy K.L., Interactions between dissolved organic matter and mercury in aquatic environments. Presented at the 15th V.M. Goldschmidt Conference, Moscow, Idaho, May 2005.
- Saiers J.E., Gao B., and Ryan J.N., 2005. Colloid deposition and mobilization mechanisms in unsaturated porous media during steady and transient flow. Presented at the European Geosciences Union, Vienna, Austria, April 2005.
- Metge D.W., Harvey R.W., Anders R., Rosenberry D.N., Landkamer L.L., Ryan J.N., and Abu-Dalo R., 2005. Use of a polydisperse mixture of carboxylated microbial-sized microspheres to assess the transport potential of *Cryptosporidium parvum* oocysts at the Russian River bank filtration site, Sonoma County, California. Presented at the 2005 Ground Water Summit, National Ground Water Association, San Antonio, Texas, April 2005.
- Aiken G.R. and Ryan J.N., 2005. Interactions of mercury with dissolved organic matter in the Everglades: Evidence for stabilization of colloidal mercuric sulfide. Presented at the Humic Substance and Technology VIII, Northeastern University, Boston, Massachusetts, March 2005.
- Turner N.B., Ryan J.N., and Saiers J.E., 2005. Effect of cation desorption kinetics on the colloid-facilitated transport of cesium and strontium. Presented at the 229th American Chemical Society National Meeting, San Diego, California, March 2005.
- Abudalo R.A., Ryan J.N., Harvey R.W., Landkamer L.L., and Metge D.W., 2005. Effect of porous media grain size and sorting on straining of *Cryptosporidium parvum* oocysts in saturated porous media. Presented at the 229th American Chemical Society National Meeting, San Diego, California, March 2005.
- Harvey R.W., Metge D.W., Shapiro A.M., Renken R.A., Osborn C.L., Ryan J.N., and Cunningham K.J., 2005. Use of carboxylated polystyrene microspheres to assess the transport potential of *Cryptosporidium parvum* oocysts in karstic limestone of the Biscayne Aquifer (Northwest Well Field, Miami, Florida). Presented at the 229th American Chemical Society National Meeting, San Diego, California, March 2005.
- Metge D.W., Harvey R.W., Shapiro A.M., Renken R.A., Osborn C.L., Ryan J.N., and Cunningham K.J., 2005. Transport potential of *Cryptosporidium parvum* oocysts in karstic limestone of the Biscayne Aquifer (Northwest Well Field, Miami, Florida): Results of field and laboratory investigations. Presented at the U.S. Geological Survey Workshop on Bank Filtration, Columbus, Ohio, February 2005.
- Renken R.A., Cunningham K.J., Zygnerski M.R., Wacker M.A., Shapiro A.M., Harvey R.W., Metge D.W., Landkamer L.L., Osborn C.L., and Ryan J.N., 2005. Assessment of pathogen transport in karst limestone at the municipal Northwest well field, Miami-Dade County, Florida. Presented at the 2005 Source Water Protection Symposium, American Water Works Association, Palm Beach, Florida, January 2005.
- DeNovio N.M. and Ryan J.N., 2004. Effect of simulated rainfall on the facilitated transport of metals in unsaturated soil cores from a flood plain contaminated by mine wastes. Presented at the American Geophysical Union Fall Meeting, San Francisco, California, December 2004.
- Saiers J.E., Gao B., and Ryan J.N., 2004. Visualization of colloid deposition and mobilization during unsteady and steady porewater flow through unsaturated porous media. Presented at the American Geophysical Union Fall Meeting, San Francisco, CA, December, 2004.
- Renken R.A., Cunningham K.J., Zygnerski M.R., Wacker M.A., Shapiro A.M., Harvey R.W., Metge D.W., Landkamer L.L., Osborn C.L., and Ryan J.N., 2004. Pathogen transport in a sole source karst aquifer near a public well field – Will limestone mine expansion near the

- Florida Everglades pose a clear and present danger to public health? Presented at the Geological Society of America Annual Meeting, November 2004.
- Osborn C.L., Ryan J.N., Harvey R.W., Metge D.W., Landkamer L.L., Renken R.A., Cunningham K.J., and Shapiro A.M., 2004. Transport and attachment of *Cryptosporidium parvum* oocysts and microspheres analogs in karstic limestone of the Biscayne aquifer, Miami-Dade County, Florida. In *Proceedings of the 11th International Symposium on Water-Rock Interaction* (Wanty R.B. and Seal R.R., eds.), Saratoga Springs, New York, June 2004, Balkema Publishers, New York, 1141-1143.
- Landkamer L.L., Harvey R.W., Metge D.W., and Ryan J.N., 2004. Modeling microbial enhancement of Zn(II) and Pb(II) transport in columns packed with geologic media. In *Proceedings of the 11th International Symposium on Water-Rock Interaction* (Wanty R.B. and Seal R.R., eds.), Saratoga Springs, New York, June 2004, Balkema Publishers, New York, 1139-1140.
- Abe Y., Abudalo R.A., Ryan J.N., Harvey R.W., and Metge D.W., 2004. Transport of *Cryptosporidium parvum* oocysts and microspheres through a two-dimensional physically and geochemically heterogeneous saturated porous media. Presented at the 78th American Chemical Society Colloids and Surfaces Symposium, New Haven, Connecticut, June 2004.
- Abudalo R.A., Bogatsu Y.G., Ryan J.N., Metge D.W., Harvey R.W., and Elimelech M., 2004. The effect of ferric oxyhydroxide surface coatings on the transport of bacteriophage PRD1 and *Cryptosporidium parvum* oocysts in saturated porous media. Presented at the 78th American Chemical Society Colloids and Surfaces Symposium, New Haven, Connecticut, June 2004.
- Abu-Dalo R.A., Bogatsu Y.G., Ryan J.N., Metge D.W., Elimelech M., and Harvey R.W., 2004. Transport of bacteriophage PRD1 and *Cryptosporidium parvum* oocysts in saturated porous media: The importance of surface ferric oxyhydroxides. Presented at the 1st Water Environment Federation/American Water Works Association Student Conference, Rocky Mountain Region, Golden, Colorado, May 2004.
- Wood A.R., Ryan J.N., Cholas R., Harrington L., Isenhardt L., and Turner N., 2004. Assessment of zinc, copper, and lead in streams and streambed sediments of the Lefthand Creek watershed, northwestern Boulder County, Colorado. Presented at the 1st Water Environment Federation/American Water Works Association Student Conference, Rocky Mountain Region, Golden, Colorado, May 2004.
- DeNovio N.M. and Ryan J.N., 2003. The effect of flow heterogeneity on the mobilization of colloids from metal-contaminated soils. *Eos, Transactions of the American Geophysical Union* **84**, H32A-0501. Presented at the Fall Meeting of the American Geophysical Union, San Francisco, California, December 2003.
- Abadiz S.D. and Ryan J.N., 2003. The deposition and release of Brownian colloids at glass surfaces exposed to stagnation point flow: The effect of colloid size. Presented at the 77th American Chemical Society Colloid and Surface Science Symposium, Atlanta, Georgia, June 2003.
- Aiken G.R., Haitzer M., Ryan J.N., and Nagy K.L., 2003. Interactions between dissolved organic matter and mercury in the Florida Everglades. Presented at the XII International Conference on Heavy Metals in the Environment, Grenoble, France, May 2003.
- DeNovio N.M. and Ryan J.N., 2003. Mobilization of colloids in unsaturated sand columns. Presented at the EGS-AGU-EUG Joint Assembly, Nice, France, April 2003.
- DeNovio N. and Ryan J.N., 2002. Evaluating mechanisms of particle mobilization in unsaturated porous media. Presented at the International Workshop on Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments, Research Center Foulom, Tjele, Denmark, September 2002.
- Aiken G.R., Waples J.S., Nagy K.L., Ryan J.N., and Ravichandran M., 2001. Dissolution of cinnabar by dissolved organic matter. Presented at the 222nd National Meeting of the American Chemical Society, Geochemistry Division, August 2001.
- Bunn R.A., Magelky R.D., Ryan J.N., and Elimelech M., 2001. Effect of chemical perturbations on the mobilization of colloids in a ferric oxyhydroxide-coated sand aquifer: field experiments. Presented at the 75th American Chemical Society Colloid and Surface Science Symposium, June 2001.
- Waples J.S., Nagy K.L., Aiken G.R., and Ryan J.N., 2001. Dissolution kinetics of cinnabar in the presence of dissolved organic matter. Presented at the 11th V.M. Goldschmidt Conference, Hot Springs, Virginia, May 2001.
- Aiken G., Reddy M., Ravichandran M., Ryan J.N., 2001. Interactions between dissolved organic matter and mercury. Presented at the 221st National Meeting of the American Chemical Society, Environmental Chemistry Division, April 2001.
- Ryan J.N., Elimelech M., and Harvey R.W., 2001. Attachment and inactivation during virus transport in groundwater. Presented at the 2001 STAR Drinking Water Progress Review Workshop, February 22-23, 2001, Silver Spring, Maryland, Report EPA/6-R-01/027, National Center for Environmental Research, U.S. Environmental Protection Agency, Washington, DC.
- Drexel R.T., Aiken G.R., Nagy K.L., and Ryan J.N., 2000. Binding of mercury(II) by two peats from the Florida Everglades, 2000. Presented at the International Workshop on Surface Chemical Processes in Natural Environments, Monte Verita, Ascona, Switzerland, October 2000.
- Drexel R.T., Aiken G.R., Nagy K.L., and Ryan J.N., 2000. Mercury(II) sorption to two Florida Everglades peats. *Abstracts of Papers of the American Chemical Society* **220**, 157:ENVR, Part 1, 2000. Presented at the 220th National Meeting of the American Chemical Society, Environmental Chemistry Division, Washington, DC, August 2000.
- Abadiz S.D. and Ryan J.N., 2000. Effect of colloid release on permeability reduction in a zeolite porous medium. *Abstracts of Papers of the American Chemical Society*, 2000. Presented at the 220th National Meeting of the American Chemical Society, Environmental Chemistry Division, Washington, DC, August 2000.
- Abadiz S.D. and Ryan J.N., 2000. Particle release and permeability reduction in a natural zeolite (clinoptilolite), a permeable reactive barrier candidate material. Presented at the Gordon Research Conference for Environmental Science: Water, Holderness School, Plymouth, New Hampshire, June 2000.
- Loveland J.P., Ryan J.N., and Elimelech M., 2000. Anionic surfactant adsorption and silica-coated colloid release in a geochemically heterogeneous porous media. Presented at the 74th Colloid and Surface Symposium of the American Chemical Society, Lehigh University, Bethlehem, Pennsylvania, June 2000.
- Bhattacharjee S., Elimelech M., and Ryan J.N., 2000. Virus transport in heterogeneous subsurface porous media. Presented at the 74th Colloid and Surface Symposium of the American Chemical Society, Lehigh University, Bethlehem, Pennsylvania, June 2000.

- Ko C.-H., Elimelech M., and Ryan J.N., 2000. The role of mineral grain zeta potential in colloid transport through geochemically heterogeneous porous media. Presented at the 74th *Colloid and Surface Symposium of the American Chemical Society*, Lehigh University, Bethlehem, Pennsylvania, June 2000.
- Ryan J.N., Metge D.W., Harvey R.W., Pieper A.P., Navigato T., and Loveland J.P., 1999. Is virus inactivation accelerated by attachment to mineral surfaces? *Eos Transactions of the American Geophysical Union* **80**, F104. Presented at the *Fall Meeting of the American Geophysical Union*, San Francisco, California, December 1999.
- Metge D.W., Navigato T., Ryan J.N., and Harvey R.W., 1999. Role of anionic surfactants in the transport and inactivation of the bacteriophage PRD1 in aquifer sediments: Results of field and laboratory experiments. Presented at the *International Symposium on Subsurface Microbiology*, Vail, Colorado, August, 1999.
- Bhattacharjee S., Elimelech M., and Ryan J.N., 1999. Modeling virus transport in geochemically and physically heterogeneous subsurface porous media. Presented at the 31st *Mid-Atlantic Industrial and Hazardous Waste Conference*, University of Connecticut, Storrs, Connecticut, June 1999.
- Ryan J.N., Aiken G.R., Backhus D.A., Villholth K.G., and Hawley C.M., 1999. Investigating the potential for colloid- and organic matter-facilitated transport of polycyclic aromatic hydrocarbons in crude-oil contaminated ground water. Presented at the *U.S. Geological Survey Toxic Substances Hydrology Technical Meeting*, Charleston, South Carolina, March, 1999.
- Ryan J.N., Elimelech M., Ard R.A., and Magelky M.D., 1999. Mobilization and transport of natural and synthetic colloids and a virus in an iron oxide-coated sewage-contaminated aquifer. Presented at the *U.S. Geological Survey Toxic Substances Hydrology Technical Meeting*, Charleston, South Carolina, March, 1999.
- Loveland J.P. and Ryan J.N., 1999. Surfactant-induced colloid release from mineral surfaces: The significance of surfactant type and concentration on release behavior. *Abstracts of Papers of the American Chemical Society* **217**, U731, Part 1. Presented at the 217th *National Meeting of the American Chemical Society*, Environmental Chemistry Division, March 1999.
- Ravichandran M., Aiken G.R., Ryan J.N., and Reddy M.M., 1999. Inhibition of precipitation and aggregation of metacinnabar (HgS) by humic substances isolated from the Florida Everglades. *Abstracts of Papers of the American Chemical Society* **217**, U746, Part 1. Presented at the 217th *National Meeting of the American Chemical Society*, Environmental Chemistry Division, March 1999.
- Ryan J.N., Elimelech M., and Magelky R.D., 1999. Silica-coated titania (TiO₂) and zirconia (ZrO₂) particles for particle transport field experiments. *Abstracts of Papers of the American Chemical Society* **217**, U776, Part 1. Presented at the 217th *National Meeting of the American Chemical Society*, Environmental Chemistry Division, March 1999.
- Ravichandran M., Aiken G.R., Reddy M.M., and Ryan J.N., 1998. Enhanced dissolution of cinnabar (mercuric sulfide) by aquatic humic substances. *Abstracts of Papers of the American Chemical Society* **216**, U785, Part 1. Presented at the 216th *National Meeting of the American Chemical Society*, Environmental Chemistry Division, August 1998.
- Aiken G.R., Ravichandran M., Reddy M.M., and Ryan J.N., 1998. Interactions of dissolved organic carbon with mercury in the Everglades, Florida. *Abstracts of Papers of the American Chemical Society* **216**, U765, Part 1. Presented at the 216th *National Meeting of the American Chemical Society*, Environmental Chemistry Division, August 1998.
- Ravichandran M., Aiken G.R., Reddy M.M., and Ryan J.N., 1998. Enhanced dissolution of cinnabar (mercuric sulfide) by Florida Everglades organic matter. *Eos, Transactions of the American Geophysical Union* **89**, S94. Presented at the *Spring Meeting of the American Geophysical Union*, May 1998.
- Ryan J.N., Harvey R.W., Metge D.W., and Larson J.E., 1997. Transport of bacteriophage PRD1 and silica colloids in a sewage-contaminated aquifer. *Eos, Transactions of the American Geophysical Union* **86**, F231. Presented at the *Fall Meeting of the American Geophysical Union*, December 1997.
- Ryan J.N., 1997. Dynamic light scattering and particle size distributions in natural waters. *Abstracts of Papers of the American Chemical Society* **214**, 19-ENVR, Part 1. Presented at the 214th *National Meeting of the American Chemical Society*, Environmental Chemistry Division, September 1997.
- Metge D.W., Harvey R.W., Ryan J.N., and Pieper A.P., 1996. The role of chemical and geochemical heterogeneities upon the transport behavior of viruses, bacteria, and carboxylated microspheres in a sandy aquifer. Presented at the *Geological Society of America Meeting*, November 1996.
- Abadzie D.S. and Ryan J.N., 1996. Particle size effect in the release of deposited Brownian colloids. Presented at the 70th *Colloid and Surface Science Symposium*, American Chemical Society, Potsdam, New York, June 1996.
- Chi F.-H., Amy G.L., Ryan J.N., and Aiken G.R., 1996. Adsorption and desorption of natural organic matter to/from mineral surfaces. Presented at the 70th *Colloid and Surface Science Symposium*, American Chemical Society, Potsdam, New York, June 1996.
- Yu P., Yang I.C., and Ryan J.N., 1996. The use of tritium to determine the mean residence time of the unsaturated zone groundwater at Yucca Mountain. *Abstracts of Papers of the American Chemical Society* **211**, 20-GEOC, Part 1. Presented at the 211th *National Meeting of the American Chemical Society Meeting*, March 1996.
- Pieper A.P., Ryan J.N., Amy G.L., Illangasekare T.H., Harvey R.W., and Metge D.W., 1995. Effect of linear alkylbenzene sulfonates on the natural-gradient transport of bacteriophage PRD1 through contaminated and uncontaminated zones of an unconfined sand aquifer. *Eos, Transactions of the American Geophysical Union* **76**, F200. Presented at the *Fall Meeting of the American Geophysical Union*, San Francisco, CA, December, 1995.
- Loveland J.P., Ryan J.N., Amy G.L., and Harvey R.W., 1995. Attachment and release of viruses from mineral surfaces: The role of secondary minimum attachment. *Abstracts of Papers of the American Chemical Society* **209**, 142-ENVR, Part 1. Presented at the 209th *National Meeting of the American Chemical Society*, April 1995.
- Edwards M., Benjamin M.M., and Ryan J.N., 1995. The acidity of organic matter and its role in adsorption to oxide surfaces. *Abstracts of Papers of the American Chemical Society* **209**, 251-ENVR, Part 1. Presented at the 209th *National Meeting of the American Chemical Society*, April 1995.
- Aronheim J.S., Illangasekare T.H., Ryan J.N., Amy G.L., Harvey R.W., Loveland J.P., and Pieper A., 1994. Biocolloid transport through saturated porous media: A two-dimensional pilot-scale study. Presented at the *Conference on Hazardous Waste Remediation*, June 1994.

- Gschwend P.M., Holmén B.A., MacKay A.A., Ryan J.N., Backhus D.A., and Chin Y.-P. , 1994. Overview: Processes limiting the occurrence of organic contaminants in moving groundwater. Presented at the *International Association of Hydrology Research Symposium on Transport and Reactive Transport in Aquifers*, ETH, Zurich, Switzerland, April 1994.
- Loveland J.P., Amy G.L., Harvey R.W., and Ryan J.N., 1994. Effect of chemical perturbations on virus attachment and detachment: Relating kinetics to intersurface potential energy. *Abstracts of Papers of the American Chemical Society* **207**, 172-ENVR, Part 1. Presented at *207th National Meeting of the American Chemical Society*, March 1994.
- Chandrakanth M.S., Amy G.L., Ryan J.N., and Edwards M., 1993. Effect of ozone on the colloidal stability of particles coated with natural organic matter. *Abstracts of Papers of the American Chemical Society* **206**, 82-ENVR, Part 1. Presented at the *206th National Meeting of the American Chemical Society*, August 1993.
- Ryan J.N., Loveland J.P., Amy G.L., and Harvey R.W., 1993. Effect of (bio)colloid size on the kinetics of detachment from packed bed surfaces. *Eos, Transactions of the American Geophysical Union* **74**, 132. Presented at the *Spring Meeting of the American Geophysical Union*, May 1993.
- Ryan J.N. and Gschwend P.M., 1993. Dissolution of a natural ferric oxyhydroxide coating on quartz grains. *Eos, Transactions of the American Geophysical Union* **74**, 328. Presented at the *Spring Meeting of the American Geophysical Union*, May 1993.
- Ryan J.N. and Gschwend P.M., 1992. Effect of solution chemistry on the detachment of clay colloids from an iron oxide-coated sand. *Eos, Transactions of the American Geophysical Union* **73**, 162. Presented at the *Fall Meeting of the American Geophysical Union*, December 1992.
- Ryan J.N. and Gschwend P.M., 1991. Extraction of iron oxides from sediments using reductive dissolution by titanium(III). *Abstracts of Papers of the American Chemical Society* **202**, 58-ENVR, Part 1. Presented at the *202nd National Meeting of the American Chemical Society*, June 1991.
- Ryan J.N. and Gschwend P.M., 1990. Colloid mobilization in an iron oxide-coated aquifer. *Eos, Transactions of the American Geophysical Union* **71**, 503-504. Presented at the *Spring Meeting of the American Geophysical Union*, May 1990.
- Ryan J.N. and Gschwend P.M., 1988. The mobilization of colloids in anoxic groundwater. Presented at the *International Conference on Advances in Ground-Water Hydrology*, American Institute of Hydrology, November 1988.
- Maest A.S., Ryan J.N., Crerar D.A., and Stallard R.F., 1984. Controls on metal and nutrient behavior in an estuary with more than two end members. *Eos, Transactions of the American Geophysical Union* **65**, 227-228. Presented at the *Spring Meeting of the American Geophysical Union*, May 1984.

INVITED LECTURES

- National Caucus of Environmental Legislators, "Using Science in Making Decisions about Oil and Gas Regulations," national webinar, February 19, 2016.
- Society of Petroleum Engineers, Denver Section, "Groundwater Quality and Oil and Gas Development in Colorado: What We Have Learned from Public Databases," Denver Athletic Club, February 17, 2016.
- Colorado Groundwater Issues Conference, "Impacts of Oil and Gas Development on Groundwater Quality in Colorado," American Ground Water Trust, Denver, Colorado, December 4, 2015.
- American Ground Water Trust Teaching Training, "AirWaterGas: What We Know, What We Don't Know, and What We Need to Learn to Make Better Decisions," Greeley High School, June 18, 2015.
- Society of Petroleum Engineers E&P Health, Safety, Security, and Environmental Conference – Americas, "Evaluating the Effects of Oil and Gas Development on Water Quality in Colorado's Oil and Gas Basins," Plenary I: Assessing and Managing our Environmental Footprint, Denver, Colorado, March 16-18, 2015.
- PLAN-Boulder County, "Incorporating Science into the Regulation of Oil and Gas Development," Boulder, Colorado, February 23, 2015.
- Boulder City Council, "Incorporating Science into the Regulation of Oil and Gas Development," Science Tuesday, October 7, 2014.
- Los Alamos National Laboratory, EES/IGPPS Frontiers in Geoscience Seminar, "What We Know and Don't Know About the Effects of Oil and Gas Development on Water Quality in Colorado's Denver-Julesburg Basin," Los Alamos, New Mexico, August 4, 2014.
- Geotech 6th Annual Field Days, "Investigations of the Effects of Oil and Gas Development on Water Quality in the Denver-Julesburg Basin," Colorado Ground Water Association, Denver, Colorado, June 19, 2014.
- Clyde Martz Summer Conference, "What We Know (And Don't Know) about Water Supply and Quality Impacts: Part I, Water Quality," Getches-Wilkinson Center for Natural Resources, Energy, and the Environment; University of Colorado School of Law, Boulder, Colorado, June 5-6, 2014.
- FrackingSENSE: Greeley, "Assessing the Potential Risks of Oil and Gas Development to Groundwater Quality," University of Northern Colorado, Greeley, Colorado, April 14, 2014.
- Hydrologic Sciences Research Symposium, "Transport Properties of Hydraulic Fracturing Fluid Compounds," University of Colorado Boulder, April 3-4, 2014.
- European Union Center of Excellence 2014 Policy Conference on Environment and Energy: Comparison of US and EU Policies, "Information Access for Research on Shale Impacts: Availability and Use of Groundwater Quality Data in Colorado," University of Pittsburgh, Pittsburgh, Pennsylvania, March 21-22, 2014.
- 24th Annual South Platte River Forum, "Investigations of the Effects of Oil and Gas Development on Water Quality in the Denver-Julesburg Basin," Longmont, Colorado, October 23, 2013.
- University of Illinois-Chicago, Department of Earth and Environmental Sciences, "Investigating Effects of Oil and Gas Development on Water Quality in the Denver-Julesburg Basin in Colorado," Chicago, Illinois, October 3, 2013.
- Colorado Environmental Health Association 58th Annual Education Conference, "To Freak or Frack: Assessing the Potential Risks of Oil and Gas Development to Groundwater Quality," Pueblo Convention Center, Pueblo, Colorado, September 27, 2013.
- Pennsylvania State University, Department of Geosciences, "Investigating Effects of Oil and Gas Development on Water Quality in the Denver-Julesburg Basin in Colorado," State College, Pennsylvania, September 3, 2013.

Rocky Mountain Energy Summit, "AirWaterGas SRN: Effects of Natural Gas and Oil Development on Water Quality," Colorado Convention Center, Denver, Colorado, August 5, 2013.

National Academy of Engineering Topical Meeting – Shale Gas: Promises and Challenges, "Effects of Oil and Gas Development on Water Quality," Severance Hall, Cleveland, Ohio, June 19, 2013.

Developing Tribal Energy Resources and Economies Conference, "Fracking – What We Know, What We Don't Know, and What We'd Like to Learn – A Balanced Discussion with Industry, Tribes, and Government," with Patricia Limerick, Albuquerque, New Mexico, June 12, 2013.

Colorado State University, Colorado Water Institute, "Economic and Environmental Trade-Offs of Unconventional Oil and Gas Extraction", with Mark Williams, Fort Collins, Colorado, February 6, 2013.

University of Denver, Department of Chemistry and Biochemistry, "Mercury, Sulfur, and Organic Matter: Controls on Mercury(II) Speciation in Water", Denver, Colorado, January 31, 2013.

Colorado Oil and Gas Association, Members of the Board, "Routes to Sustainability for Natural Gas Development and Air and Water Resources in the Rocky Mountain Region", with Patricia Limerick, Denver, Colorado, January 30, 2013.

Colorado Petroleum Association, "Routes to Sustainability for Natural Gas Development and Air and Water Resources in the Rocky Mountain Region", with Patricia Limerick, Denver, Colorado, November 8, 2012.

Colorado Oil and Gas Association, "Routes to Sustainability for Natural Gas Development and Air and Water Resources in the Rocky Mountain Region", with Patricia Limerick, Denver, Colorado, November 7, 2012.

Longmont Rotary Club, "To Freak or Frack: That is the Question", Longmont, Colorado, April 12, 2012.

Trinidad State Junior College, "Mercury, Fire, and Fish in the Reservoirs of Southwestern Colorado", Trinidad, Colorado, April 12, 2012.

Colorado School of Mines, Department of Chemistry and Geochemistry, "Effects of Fire on Mercury and Sulfur in Forest Soils", Golden, Colorado, November 3, 2011.

University of Colorado Boulder, Chancellor's Seminar, "The Environmental Legacy of Mining in Boulder County: Can – and Will – Communities Clean up Abandoned Mines?", Discovery Learning Center, September 17, 2010.

Colorado School of Mines, Department of Chemistry and Geochemistry, "Mercury, Sulfur, and Organic Matter: Controls on Mercury(II) Speciation in Water", Golden, Colorado, November 13, 2009.

The John Hopkins University, Department of Geography and Environmental Engineering, "Microbe Transport in Groundwater: The Role of Physical and Geochemical Heterogeneity", Baltimore, Maryland, March 3, 2009.

University of Colorado at Boulder, Farrand Residential Academic Program, "Cleaning Up Abandoned Hard Rock Mines in the American West: Who Will Do It – And How?" Boulder, Colorado, February 5, 2009.

Lincoln University, Waterwatch Canterbury Programme, "Microbe Transport in Groundwater: The Role of Physical and Geochemical Heterogeneity," Lincoln, New Zealand, November 2008.

Environmental Science and Research, "Microbe Transport in Groundwater: The Role of Physical and Geochemical Heterogeneity," Christchurch, New Zealand, October 2008.

Environmental Science and Research, "Mercury, Sulfur, and Organic Matter: Controls on Mercury Speciation and Bioavailability," Christchurch, New Zealand, September 2008.

University of Canterbury, Department of Civil and Natural Resources Engineering, "Assessing the Sources of Metals in a Watershed Affected by Acid Mine Drainage (and Residents Averse to Disturbance of Their Peaceful Mountain Lives!)" Christchurch, New Zealand, August 2008.

University of Colorado at Boulder, Center for Science and Technology Policy Research, "On the Long Road to Jericho: Abandoned Mine Cleanups, the Clean Water Act, and Environmental Good Samaritans." Boulder, Colorado, March 2008.

Rocky Mountain College of Art and Design, "Science, Research, and the Scientific Method: Extrapolation to Art," Lakewood, Colorado, January 2008.

University of Colorado at Boulder, Department of Chemistry and Biochemistry, Environmental and Analytical Chemistry Division, "Interactions of Dissolved Organic Matter with Mercury(II): Binding in Solution, Inhibition of Precipitation, and Enhancement of Dissolution," Boulder, Colorado, December 2007.

National Summit of Mining Communities, "The water we drink: Effects of acid mine drainage on stream water quality," Leadville, Colorado, September 2007.

National Summit of Mining Communities, "The altered environment: An overview of the effects of mining on the air, water, and land," Leadville, Colorado, September 2007.

McGill University, Department of Chemical Engineering, "Mercury, Sulfur, and Organic Matter: Controls on Mercury Speciation and Bioavailability," Toronto, Ontario, Canada, July 2007.

University of Colorado at Boulder, Hydrologic Sciences Student Research Symposium, "Colloids, Contaminants, and Surface Chemistry: Effect of Desorption Kinetics on the Facilitated Transport of Cesium and Strontium by Illite Colloids," Boulder, Colorado, March 2007.

Duke University, Civil and Environmental Engineering Department, "How Organic Matter Affects the Speciation of Mercury in the Florida Everglades, the Sacramento-San Joaquin Delta, and Our Laboratory," Durham, North Carolina, February 2007.

University of Colorado at Boulder, Puksta Scholars Seminar Series, "Helping Colorado Communities Dealing With the Legacy of Mining," Boulder, Colorado, April 2006.

University of Colorado at Boulder, Center for Science and Technology Policy Research/Western Water Assessment, "Mines, Metals, Western Water Quality, and the Gospel of Luke 10:25-37," Boulder, Colorado, February 2006.

Colorado School of Mines, Environmental Engineering Sciences Division, "Hydrologic Sensitivity Training: The Transport of *Cryptosporidium parvum* Oocysts in Karst and Heterogeneous Porous Media," Golden, Colorado, October 2004.

U.S. Environmental Protection Agency Science to Achieve Results Environmental Research Seminar, "Pathogenic Microbe Removal During Riverbank Filtration," Denver, Colorado, May 2004.

Colorado Riparian Association 16th Annual Conference on Mining and Riparian Areas, "Remediation of Abandoned Mines: Can and Will Communities Participate?" Alamosa, Colorado, October, 2003.

The Reynolds Lecture Series, Colorado Chautauqua Association, "Cleaning Up Waters Polluted by Abandoned Mines: Obstacles and Opportunities," Boulder, Colorado, July 2003.

University of Colorado at Boulder, Center for Science and Technology Policy Research, Brown Bag Seminar Series, "Abandoned Mines and Acid Mine Drainage: Achievements and Obstacles in Community-Driven Remediation," Boulder, Colorado, March 2003.

U.S. Environmental Protection Agency, Region 8 Mining Brown Bag Seminar, "Abandoned Mines and Acid Mine Drainage: Identification of Metal Sources," Denver, Colorado, March 2003.

Center of the American West, "Healing the West: Remedy, Repair, Restoration, and Mitigation" Series, "Abandoned Mines and Acid Mine Drainage: Dealing with the Legacy of 'Hit-and-Run' Mining in the West," Chautauqua Community Hall, Boulder, Colorado, March 2003.

International Workshop on Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments, Research Center Foulom, "Virus Transport in Porous Media," Tjele, Denmark, September 2002.

U.S. Environmental Protection Agency, National Center for Environmental Research, STAR Drinking Water Meeting, "Attachment and Inactivation During Virus Transport in Groundwater," Washington, DC, February 2001.

Colorado School of Mines, Environmental Engineering Sciences Division, "Simulating the Effects of Rainfall on Particle and Plutonium Transport in Rocky Flats Soils," Golden, Colorado, October 1998.

Ohio State University, Joint Geological Sciences-Civil and Environmental Engineering Seminar Series, "Mobilizing Particles (and Plutonium) in Macroporous Soils during Rainfall Simulations at Rocky Flats, Colorado," Columbus, Ohio, October 1998.

American Chemical Society, Environmental Chemistry Division, "Dynamic Light Scattering and Particle Size Distributions in Natural Waters," Las Vegas, Nevada, September 1997.

American Society of Agronomy Annual Meeting, "Role of Particles in Actinide Transport Through Soils during Simulated Rainfall," Indianapolis, Indiana, November 1996.

Danish Technical University, Institute for Hydrodynamics and Water Resources, "Colloids and Colloid-Facilitated Transport in the Subsurface," Hørsholm, Denmark, August 1996.

American Chemical Society, 13th Rocky Mountain Regional Meeting, "Effect of Organic Matter on Virus Transport in a Sewage-Contaminated Aquifer," Lakewood, Colorado, June 1996.

International Fine Particles Research Institute, Annual Meeting, University of Illinois, "Colloid-Facilitated Transport in Groundwater," Urbana-Champaign, Illinois, July 1995.

Engineering Foundation Conference, Separation Technology VI: Advances and Opportunities in Environmental Separations, "Role of Colloids in the Distribution of Contaminants in Subsurface Environments," Snowbird, Utah, July 1995.

V.M. Goldschmidt Conference, Pennsylvania State University, "Particle Mobilization and Plutonium Transport in Soil during Rainfall Simulations," University Park, Pennsylvania, May 1995.

Gordon Research Conference, Environmental Sciences – Water, "When Do Colloids Affect Contaminant Transport in Soils?" New Hampton School, New Hampshire, June 1994.

Colorado School of Mines, Environmental Engineering Sciences Division, "Effects of Solution Chemistry on the Release of Colloids from an Iron Oxide-Coated Sand," Golden, Colorado, March 1994.

California Institute of Technology, Environmental Engineering and Sciences Division, "Colloid Release from Surfaces: Dancin' the Two Step," Pasadena, California, January 1994.

U.S. Geological Survey, Water Resources Division, "Dissolution of a Natural Ferric Oxyhydroxide Coating on Quartz Grains," Boulder, Colorado, May 1993.

POPULAR PRESS AND MEDIA

"Citizen Science On The Rez – Kids, Science, And North Dakota's Oil Boom," November 23, 2015, interview and audio on *Inside Energy*, <http://insideenergy.org/2015/11/23/citizen-science-on-the-rez-kids-science-and-north-dakotas-oil-boom/>.

"Live from Denver: Oil and Gas Industry Pushes Back Against Local Fracking Bans," September 18, 2015, interview and video on *The Fuse*, <http://www.energyfuse.org/videos/live-from-denver-oil-and-gas-industry-pushes-back-against-local-fracking-bans/>.

"Mercury in Water / AirWaterGas Update," October 21, 2014, interview on "How on Earth," KGNU Radio, Boulder, Colorado, <http://howonearthradio.org/archives/4362>.

"The Crux of Determining Fracking's Safety," September 4, 2014, interview and article on KUNC Radio, Greeley, Colorado, <http://www.kunc.org/post/crux-determining-frackings-safety>.

"AirWaterGas Update," January 13, 2014, interview on "A Public Affair" show, KGNU Radio, Boulder, Colorado.

"Mercury in the Four Corners," January 10, 2013, interview on KJSD Radio, Cortez, Colorado.

"How Best to Live with Fracking," October 23, 2012, interview on "How on Earth" show, KGNU Radio, Boulder, Colorado, with Jana Milford.

"Guest Opinion: COGA Standards a Good Start, but Much More Needed," February 28, 2012, *Boulder Daily Camera*, authored by Mark Williams, Joseph Ryan, and Adrienne Kroepsch.

"Helping Colorado Communities with Water Quality Problems," August 2008, *Colorado Municipalities*, Natural Resources Issue, Colorado Municipal League (www.cml.org).

"Cleaning Up Abandoned Hard-Rock Mines in the American West," January 2008, interview on "How on Earth" show, KGNU Radio, Boulder, Colorado.

"Abandoned Mines in Boulder County," July 11, 2003, *Boulder Daily Camera*, Opinion page.

CURRENT RESEARCH SUPPORT, EXTERNAL AND INTERNAL

Routes to Sustainability for Natural Gas Development and Water and Air Resources in the Rocky Mountain Region, National Science Foundation, Chemical, Bioengineering, Environmental, and Transport Division (CBET-1240584), October 1, 2012 to September 30, 2017, PI: J.N. Ryan, co-PIs: P. Bourgeron, M. Williams, M. Hannigan, and P. Limerick, University of Colorado Boulder (\$11,999,328; nine institutions, 27 investigators).

PAST EXTERNAL RESEARCH SUPPORT

Effects of Fire and Subsequent Sediment Burial on Sulfur and Mercury Binding in Organic Matter of Forest Soils. National Science Foundation, Earth Sciences Division, Geobiology and Low-Temperature Geochemistry (EAR-0952068), August 2010 to July 2015, PI: J.N. Ryan (\$325,395), co-PIs: K.L. Nagy, University of Illinois at Chicago; G.R. Aiken, U.S. Geological Survey; and K. Nydick, Mountain Studies Institute, Silverton, Colorado.

Mercury Release from Natural Organic Matter (NOM), Minerals, and NOM-Coated Mineral Surfaces, Department of Energy, Environmental Science and Remediation Program (DOE-SC0001766), September 2009 to September 2014, PI: K.L. Nagy, University of Illinois-Chicago, co-PIs: J.N. Ryan (\$304,700) and G.R. Aiken, U.S. Geological Survey.

The Effect of Dissolved Organic Matter and Mixing Energy on the Release of Trace Elements from Coal Ash in Natural Surface Waters, Oak Ridge Associated Universities/Tennessee Valley Authority (Cooperative Agreement/Grant 7-22977), May 2010 to April 2013, PI: J.N. Ryan (\$299,874), co-PI: G.R. Aiken, U.S. Geological Survey.

Colloid-Facilitated Transport of Radioactive Cations in the Vadose Zone: Field Experiments at Oak Ridge National Laboratory, Department of Energy, Environmental Science and Management Program (DOE-FG02-08ER64639), August 2008 to July 2012, PI: J.N. Ryan (\$306,486), co-PIs: J.E. Saiers, Yale University, and P.M. Jardine, Oak Ridge National Laboratory.

The Role of Natural Organic Matter and Mineral Colloids in the Transport of Contaminants through Heterogeneous Vadose Zone Environments, Department of Energy, Environmental Science and Management Program (DE-FG02-06ER64189), February 2006 to January 2010, PI: J.E. Saiers, Yale University, co-PI: J.N. Ryan (\$261,629).

Stream-Sediment Bed Exchange of Colloids and Colloid-Associated Metals in Acid Mine Drainage Environments, National Science Foundation, Earth Sciences Division, Hydrologic Sciences Program (EAR-0538265), August 2006 to July 2010, PI: J.N. Ryan (\$219,365), co-PIs: D.M. McKnight, University of Colorado and J. Ren, Texas A&M University at Kingsville.

Interactions of Mercury and Other Metals with Natural Organic Matter: Binding by Dissolved Organic Matter, Inhibition of Mercuric Sulfide Precipitation, and Enhancement of Mercuric Sulfide Dissolution, National Science Foundation, Earth Sciences Division, Geobiology and Low-Temperature Geochemistry (EAR-0447386), September 2005 to August 2009, PI: J.N. Ryan (\$315,598), co-PIs: K.L. Nagy, University of Illinois at Chicago, and G.R. Aiken, U.S. Geological Survey.

Influences of Flow Transients and Porous Medium Heterogeneity on Colloid-Associated Contaminant Transport in the Vadose Zone, Department of Energy, Environmental Science and Management Program (DE-FG07-02ER63491), September 2002 to August 2006, \$589,996, PI: J.E. Saiers, Yale University (\$359,996), co-PI: J.N. Ryan (\$230,000).

Development of an Electrochemical Surrogate for Copper, Lead, and Zinc Bioaccessibility in Aquatic Sediments, Department of Defense, Strategic Environmental Research and Development Program, October 2009 to September 2011, PI: A. Slowey, U.S. Geological Survey; co-PIs: J.N. Ryan (\$17,737) and G.R. Aiken, U.S. Geological Survey.

Microbial Pathogen Removal During Riverbank Filtration, U.S. Environmental Protection Agency, STAR Program CR-82901001-0), September 2001 to August 2005, \$506,006, PI: J.N. Ryan (\$249,903), co-PIs: M. Elimelech, Yale University (\$256,103) and R.W. Harvey, U.S. Geological Survey.

Collaborative Research: Evaluation of the Effects of Physical and Geochemical Heterogeneity on Virus Transport in Aquifers, National Science Foundation, Small Grant for Exploratory Research (BES-0233183), September 2002 to February 2005, \$99,920, PI: C. Welty, Drexel University (\$50,000), co-PIs: J.N. Ryan (\$49,920) and R.W. Harvey, U.S. Geological Survey.

Microbe Transport in Saturated Filter Sand and Karst Media, U.S. Geological Survey/Colorado Water Resources Research Institute (G-4153-1), September 2002 to November 2004, \$42,857, PI: J.N. Ryan.

Abandoned Mined Land Workshop – A Three-Day Workshop to Examine Successful and Stymied Efforts to Remediate Abandoned Hard Rock Mines that Generate Acid Mine Drainage in the Western United States, U.S. Environmental Protection Agency, Region 8, October 2004, \$12,000, PI: J.N. Ryan and P.N. Limerick (Center of the American West, University of Colorado at Boulder).

Mobilization and Transport of Particles and Particle-Associated Contaminants in the Unsaturated Zone, National Science Foundation, Earth Sciences Division, Hydrologic Sciences Program (EAR-9909553), September 2000 to August 2004, \$252,000, PI: J.N. Ryan.

Locating the Sources of Metals and Acidity in the Lefthand Creek Watershed (Northwestern Boulder County, Colorado), Honeywell International, Inc., April 2003 to July 2004, \$20,000, PI: J.N. Ryan.

Interactions of Mercury with Organic Matter in Water and Soils, National Science Foundation, Environmental Geochemistry and Biogeochemistry Program (EAR-9807735), September 1998 to August 2002, \$250,000, PI: J.N. Ryan (\$250,000), co-PIs: G.R. Aiken, U.S. Geological Survey; K.L. Nagy, University of Colorado.

Virus Attachment, Release, and Inactivation During Groundwater Transport, U.S. Environmental Protection Agency, Exploratory Research (R826179), January 1998 to December 2001, \$372,392, PI: J.N. Ryan (\$196,049), co-PIs: M. Elimelech, University of California at Los Angeles (\$176,343); R.W. Harvey, U.S. Geological Survey, Boulder.

The Role of Organic Matter in the Fate of Mercury in the Florida Everglades, U.S. Geological Survey/Colorado Water Resources Research Institute, September 1998 to June 1999, \$12,901, PI: J.N. Ryan.

Colloid Mobilization and Transport in Contaminant Plumes: Field Experiments and Modeling, U.S. Environmental Protection Agency (CR-824593), October 1995 to September 1997, \$199,800, PI: J.N. Ryan, co-PI: M. Elimelech, University of California, Los Angeles.

The Advance of Colloid Mobilization and Transport Fronts: Intermediate-Scale Experiments, National Science Foundation (EAR-9418472), September 1995 to August 1998, \$188,000, PI: J.N. Ryan (\$100,339), co-PI: M. Elimelech, University of California at Los Angeles (\$87,661).

The Role of Organic Matter in the Fate of Mercury in the Florida Everglades, U.S. Geological Survey/Colorado Water Resources Research Institute (G-2937-1), September 1995 to June 1996, \$71,625, PI: J.N. Ryan.

Novel Approaches to Probing the Mechanism of Brownian Colloid Release from Packed Bed Surface, National Science Foundation, Research Initiation Award (CTS-9410301), September 1994 to August 1998, \$99,971, PI: J.N. Ryan.

Competitive Binding of Polycyclic Aromatic Hydrocarbons (PAHs) by Aqueous Organic Matter, Mineral-Bound Organic Matter, and Mineral Surfaces: Effects on Groundwater Transport of PAHs, National Science Foundation (BES-9307190), May 1994 to April 1997, \$295,000, PI: G.L. Amy (\$147,500), co-PI: J.N. Ryan (\$147,500).

Tracer Experiments in the Vadose Zone at the Rocky Flats Plant Site, EG&G Rocky Flats/U.S. Department of Energy, April 1993 to November 1993, \$58,000, PI: T.H. Illangasekare (\$58,000), co-PIs: M. Nachabe, J.N. Ryan, J. White, M. Williams.

Groundwater Transport of Viruses, National Water Research Institute/U.S. Environmental Protection Agency, December 1992 to December 1994, \$200,000, PI: J.N. Ryan (\$200,000), co-PIs: R.W. Harvey, G.L. Amy, and T.H. Illangasekare.

PAST INTERNAL RESEARCH SUPPORT

Assessing the Effects of Natural Gas Production on Water Quality in Garfield County, Colorado: A Collaboration with Garfield County, Colorado. University of Colorado Boulder Outreach Committee, July 2010-June 2012, PI: J.N. Ryan (\$16,000).

Participation in *Hardrock Revision*: A Collaboration with the Colorado Art Ranch to Plan Uses for an Abandoned Mine in Lake City, Hinsdale County, Colorado. University of Colorado Boulder Outreach Committee, July 2011-June 2012, PI: J.N. Ryan (\$8,000).

Assessing the Extent of Mercury Contamination in the Reservoirs, Lakes, and Streams of Southwestern Colorado: A Collaboration with the Mountain Studies Institute, the Southern Ute Indian Tribe, and the Pine River Watershed Group. University of Colorado at Boulder, Outreach Committee, July 2008 to June 2010, PI: J.N. Ryan (\$16,000).

Investigating the Fate and Transport of Endocrine-Disrupting Chemicals in Natural Waters. Innovative Seed Grant Program, Graduate School, University of Colorado at Boulder, July 2008 to June 2010, PI: J.N. Ryan (\$43,000).

Assessing the Effects of Abandoned Mines on Water Quality in the Coal Creek Watershed, Crested Butte, Colorado. University of Colorado at Boulder, Outreach Committee, September 2005 to August 2008, \$24,000, PI: J.N. Ryan.

Monitoring the Restoration of Lower Lefthand Creek Watershed for the James Creek Watershed Initiative. University of Colorado at Boulder, Outreach Committee, September 2006 to August 2008, \$8,000, PI: J.N. Ryan.

Relating Bioavailability of Metals to Metal Speciation and Colloid Nature and Abundance in Mountain Streams Contaminated by Acid Mine Drainage in Northwestern Boulder County, Colorado, University of Colorado at Boulder, Council on Research and Creative Work, November 2004 to October 2005, \$7,000, PI: J.N. Ryan.

Contributing to the Remediation of Abandoned Mines in the Lefthand Creek Watershed (Northwestern Boulder County, Colorado) with the Lefthand Watershed Oversight Group, University of Colorado at Boulder, Outreach Committee, January 2003 to December 2005, \$24,000, PI: J.N. Ryan.

Assessing the Risk of Mine Wastes in Jamestown, Colorado (Northwestern Boulder County), with the Citizens Advisory Group for the Environment and the James Creek Watershed Initiative, University of Colorado Outreach Committee, January to December 2002, \$5,000, PI: J.N. Ryan.

Investigating the Effects of Off-Road Vehicles on the Macroinvertebrate Population and Water Quality of James Creek with the James Creek Watershed Initiative, University of Colorado Outreach Committee, February 2001 to December 2001, \$4,000, PI: J.N. Ryan.

Assessing the Effects of Off-Road Vehicles on Turbidity in the James Creek Watershed, Northwest Boulder County, Colorado, University of Colorado Outreach Committee, September 1999 to August 2000, \$8,000, PI: J.N. Ryan.

Assessing the Role of Attachment in Virus Inactivation in Groundwater, Grant-in-Aid, Council on Research and Creative Work, University of Colorado, January to December, 1997, \$4,000, PI: J.N. Ryan.

Colloids in Groundwater: Determining the Effects of Pumping Rate on the Suspension of Artificial Colloids During Groundwater Sampling, Grant-in-Aid, Council on Research and Creative Work, University of Colorado, January 1994 to December 1994, \$4,000, PI: J.N. Ryan.

COURSES

CVEN 3414 *Fundamentals of Environmental Engineering*, undergraduate level, rotating.

CVEN 4404 *Water Chemistry* and CVEN 4414 *Water Chemistry Laboratory*, many semesters.

CVEN 4424 *Environmental Organic Chemistry*, once per year.

CVEN 5404, *Water Chemistry*, graduate level, once per year.

CVEN 5424 *Environmental Organic Chemistry*, many semesters.

CVEN 5474, *Hazardous Waste Management*, graduate level, 2 semesters

CVEN 5834, *Remediation of Subsurface Contamination*, graduate level, seminar, 1 semester

CVEN 6414, *Aquatic Surfaces and Particles*, graduate level, surface chemistry and colloid chemistry, approximately every other year

EVEN 1000, Introduction to Environmental Engineering, undergraduate level, five semesters.

EVEN 4100, Environmental Sampling and Analysis, undergraduate level, two semesters.

EVEN 4830/ENVS 5100, *Multidisciplinary Perspectives on Abandoned Mine Remediation*, undergraduate and graduate level, abandoned mine remediation designs by student teams, fall 2003, co-taught with Dr. David Stiller

GEEN 1400, *First Year Engineering Projects*, undergraduate level, 3 semesters

ENCH 421 *Industrial Pollution Control*, undergraduate level, Department of Chemical Engineering, University of Canterbury, Christchurch, New Zealand

ENCI 383 *Environmental Engineering 2*, undergraduate level, Department of Civil and Natural Resources Engineering, University of Canterbury, Christchurch, New Zealand

Fate and Transport of Colloids and Colloid-Associated Contaminants in the Subsurface, August 1996 (expenses and honorarium). One-week course and laboratory, Danish Technical University, Lyngby, Denmark, 17 M.S. and Ph.D. students, one semester credit

Colloids, Biocolloids, and Colloid-Facilitated Transport in the Subsurface Environment, E&AS 648b, Yale University, Spring 2001

TEACHING SUPPORT

Outfitting the New Student Water Quality Laboratory with Multimedia Teaching, Microscopy, and Data Acquisition Technology, Engineering Excellence Fund, College of Engineering and Applied Science, University of Colorado, November 2002 to October 2003, \$1,000, PI: J.N. Ryan, co-PIs: Mark Hernandez, Diane McKnight, and Scott Summers.

Outfitting the New Undergraduate Water Quality Laboratory with Multimedia Teaching, Microscopy, and Data Acquisition Technology, Engineering Excellence Fund, College of Engineering and Applied Science, University of Colorado, July 2002 to June 2003, \$16,000, PI: J.N. Ryan, co-PIs: Mark Hernandez, Diane McKnight, and Scott Summers.

Integrating Field Experiences into CVEN 3454 Water Quality Through Short Internships with the James Creek Watershed Initiative, Internship Program, Career Services, University of Colorado, January to December 2001, \$1,000.

Water Quality Monitoring Equipment for Water Quality (CVEN3454) and Stream Ecology (CVEN 5834) Laboratories, Engineering Excellence Fund, College of Engineering and Applied Science, University of Colorado, July 1998 to June 1999, \$15,994, co-PI: Diane McKnight.

Water Quality (CVEN 3454) Experiments for Assessing the Mechanisms Controlling the Coagulation of Particles in Water Treatment, Undergraduate Excellence Fund, College of Engineering and Applied Science, University of Colorado, July 1995 to June 1996, \$7,000.

Water Quality Laboratory (CVEN 3454) Experiments for Understanding the Fate and Transport of Organic Contaminants in Natural Waters, Undergraduate Excellence Fund, College of Engineering and Applied Science, University of Colorado, July 1994 to June 1995, \$17,228.

GRADUATE AND UNDERGRADUATE THESES

Abadzic D.S., 2002. Probing the Mechanisms of Brownian Colloid Release from Porous Media Surfaces. Ph.D. Thesis. Thesis Committee: Menachem Elimelech, Yale University; Ronald Harvey, U.S. Geological Survey; Mark Hernandez and JoAnn Silverstein, Civil, Environmental, and Architectural Engineering.

Abe Y., 2003. Transport of *Cryptosporidium parvum* Oocysts in a Geochemically and Physically Heterogeneous Porous Medium. M.S. thesis. Thesis Committee: Subhrendu Gangopadhyay, Civil, Environmental, and Architectural Engineering; Ronald Harvey, U.S. Geological Survey.

Abu-Dalo R.A., 2006. Evaluation of the Effect of Geochemical and Physical Heterogeneity on *Cryptosporidium parvum* Oocyst Transport in Saturated Porous Media. Ph.D. thesis. Thesis Committee: JoAnn Silverstein and Scott Summers, Civil, Environmental, and Architectural Engineering; Lee Landkamer and Ronald Harvey, U.S. Geological Survey.

Ard R.A., 1997. Natural and Artificial Colloid Mobilization in a Sewage-Contaminated Aquifer: Field and Laboratory Studies. M.S. Thesis. Thesis Committee: Mark Edwards and Tissa Illangasekare, Civil, Environmental, and Architectural Engineering.

Aronheim J.S., 1995. Virus Transport in Groundwater: Modeling of Bacteriophage PRD1 Transport through One-Dimensional Columns and a Two-Dimensional Aquifer Tank. M.S. Thesis. Thesis Committee: Ronald Harvey, U.S. Geological Survey; Tissa Illangasekare, Civil, Environmental, and Architectural Engineering.

Babbington S.P., 2005. Water Quality After Industrial Influence: A Use Attainability Analysis on Lake Calumet in Chicago, Illinois. B.A. Honors Thesis, Environmental Studies Program. Thesis Committee: Dale Miller, Environmental Studies; James White, Geological Sciences.

Barron M., 2001. The Role of Structural and Chemical Factors in Partitioning of Hydrophobic Organic Compounds to Dissolved Humic Substances and Surfactants. M.S. thesis. Thesis Committee: Gary Amy, Civil, Environmental, and Architectural Engineering; Cary Chiou, U.S. Geological Survey.

Bautts, S., 2005. An Investigation of Metal Concentrations in Waste Rock Piles, Stream Water, Benthic Macroinvertebrates, and Stream Bed Sediments to Assess Long-term Impacts of Intermittent Precipitation Events in the Lefthand Creek Watershed, Northwestern Boulder County, Colorado. M.S. thesis. Thesis Committee: Diane McKnight and JoAnn Silverstein, Civil, Environmental, and Architectural Engineering.

- Bulicek M.C.D., 2013. Transport and Mobilization of Pathogenic Microbes and Microspheres in Unsaturated Fractured Media: Effect of Microbe Size, Soil Physical Heterogeneity, and Intermittent Flow and Effect Of Redox Conditions on the Release Of Trace Elements from Submerged Coal Ash Near the Kingston Fossil Plant. M.S. thesis. Thesis Committee: George Aiken and Ronald Harvey, U.S. Geological Survey; Diane McKnight, Civil, Environmental, and Architectural Engineering.
- Carella C.A., 2013. Electrical Conductivity as a Surrogate for Dissolved Ionic Stream Tracer Samples. M.S. Thesis. Thesis Committee: Blaine McCleskey, U.S. Geological Survey; Diane McKnight and Jeffrey Writer, Civil, Environmental, and Architectural Engineering.
- Craven A.M., 2012. The Importance of Dissolved Organic Matter to the Binding of Copper and the Release of Trace Elements from Coal Ash. Ph.D. Thesis. Thesis Committee: George Aiken, U.S. Geological Survey; Steven George, Jose Jimenez, and Rainer Volkamer, Chemistry and Biochemistry.
- DeNovio N.M., 2003. Particle and Particle-Facilitated Contaminant Transport in the Vadose Zone. Ph.D. Thesis. Thesis Committee: Diane McKnight, Balaji Rajagopalan, and Harihar Rajaram, Civil, Environmental, and Architectural Engineering; James Ranville, Colorado School of Mines.
- Dittrich T.M., 2012. The Role of Desorption Kinetics and Physical Heterogeneity in the Colloid-Facilitated Transport of Cesium and Strontium Through an Unsaturated Quartz Porous Medium. Ph.D. Thesis. Thesis Committee: Diane McKnight, Harihar Rajaram, and R. Scott Summers, Civil, Environmental, and Architectural Engineering, Eric Small-Tilton, Geological Sciences.
- Drexel R.T., 2000. Mercury(II) Sorption to Two Florida Everglades Peats: Effects of pH, Ionic Strength, Calcium, Chloride, and Dissolved Organic Matter. M.S. Thesis. Thesis Committee: George Aiken, U.S. Geological Survey; Kathryn Nagy, Geological Sciences.
- Duren S.M., 2001. Effect of Off-Road Vehicle Recreation on Benthic Macroinvertebrate Population in James Creek, Northwestern Boulder County, Colorado. B.A. Honors Thesis, Environmental Studies Program. Thesis Committee: Diane McKnight, Civil, Environmental, and Architectural Engineering; Mark Williams, Geography and Institute for Alpine and Arctic Research.
- Gasper J.D., 2003. Measurement of Mercury-Dissolved Organic Matter Stability Constants: Three Methods and the Importance of the Detection Window and the Metal Concentration Effect. M.S. thesis. Thesis Committee: George Aiken, U.S. Geological Survey; Kathryn Nagy, Geological Sciences.
- Gerbig, C.A., 2011. The Effects of Dissolved Organic Matter on Mercury-Sulfide Interactions in Aqueous Systems. Ph.D. thesis. Thesis Committee: George Aiken, U.S. Geological Society; Diane McKnight and Scott Summers, Civil, Environmental and Architectural Engineering; and Alexis Templeton, Geological Sciences.
- Gilbert H.L., 1999. Evaluation of the Causes and Effects of Turbidity in James Creek, Northwest Boulder County, Colorado. B.A. Honors Thesis, Environmental Studies Program. Thesis Committee: James White, Environmental Studies.
- Green R.C., 1997. Fluorescence Polarization Colloid Charge Titration: Development and Application for Feed Forward Coagulant Control at Water Treatment Plants. M.S. Thesis. Thesis Committee: Gary Amy, Civil, Environmental, and Architectural Engineering; Roger Jordan, Clearcorp, Inc..
- Hawley C.M., 1996. Role of Colloidal Phases in the Removal of Polycyclic Aromatic Hydrocarbons from Aquifer Sediments. M.S. Thesis. Thesis Committee: George Aiken, U.S. Geological Survey; Gary Amy, Civil, Environmental, and Architectural Engineering.
- Hill M., 2010. Effects of Natural Gas Production on Water Quality in Garfield County, Western Colorado. B.S. Honors Thesis, Environmental Studies Program. Thesis Committee: Dale Miller, Environmental Studies; Mark Williams, Geography/Institute for Arctic and Alpine Research.
- Keefe S., 2001. Modeling Fate and Transport of Organic Compounds in a Constructed Wetland. M.S. Thesis. Thesis Committee: Larry Barber II, U.S. Geological Survey; Diane McKnight, Civil, Environmental, and Architectural Engineering.
- Loveland J.P., 1995. Virus Transport in Groundwater: Bacteriophage PRD1 Attachment to Mineral Surfaces. M.S. Thesis. Thesis Committee: Gary Amy, Civil, Environmental, and Architectural Engineering; Ronald Harvey, U.S. Geological Survey.
- McCleskey, R.B., 2010. Electrical Conductivity: Theory and Application for Natural Waters. Ph.D. Thesis. Thesis Committee: James Ball and Kirk Nordstrom, U.S. Geological Survey; Diane McKnight and Scott Summers, Civil, Environmental, and Architectural Engineering.
- Mohanty S., 2011. Colloid-Facilitated Transport of Cations in an Unsaturated Fractured Soil Under Transient Conditions. Ph.D. thesis. Thesis Committee: George Aiken, U.S. Geological Society; Diane McKnight and Hari Rajaram, Civil, Environmental and Architectural Engineering; and Alexis Templeton, Geological Sciences.
- Norvell, A.S., 2011. Stream-Sediment Bed Exchange of Colloids and Colloid-Associated Metals in Acid Mine Drainage-Affected Environments. Ph.D thesis. Thesis Committee: Diane McKnight and Hari Rajaram, Civil, Environmental and Architectural Engineering; Robert Runkel, U.S. Geological Society; and Alexis Templeton, Geological Sciences.
- Osborn C., 2004. The Effect of Changes in Solution Chemistry on the Attachment of *Cryptosporidium parvum* Oocysts and Microspheres to Limestone and the Transport of *Cryptosporidium parvum* Oocysts and Microspheres in Intact

- Limestone Cores, M.S. Thesis. Thesis Committee: Ronald Harvey, U.S. Geological Survey; JoAnn Silverstein, Civil, Environmental, and Architectural Engineering.
- Pei Y., 1996. Assessing Water Flow Through the Unsaturated Zone at Yucca Mountain, Nevada, Using Isotopic Tracers. Ph.D. Thesis. Thesis Committee: Tissa Illangasekare and Harihar Rajaram, Civil, Environmental, and Architectural Engineering; James White, Geological Sciences; In Che Yang, U.S. Geological Survey.
- Peirce A.J., 2005. Evaluation of the Effects of Physical and Geochemical Heterogeneity of Virus Transport in Aquifers. M.S. thesis. Thesis Committee: Ronald W. Harvey, U.S. Geological Survey; Lee Landkamer, U.S. Geological Survey; and Harihar Rajaram, Civil, Environmental, and Architectural Engineering.
- Pieper A.P., 1995. Virus Transport in Groundwater: A Natural-Gradient Field Experiment in a Contaminated Sandy Aquifer. M.S. Thesis. Thesis Committee: Gary Amy, Civil, Environmental, and Architectural Engineering; Ronald Harvey, U.S. Geological Survey.
- Ravichandran M., 1999. Interactions Between Mercury and Dissolved Organic Matter in the Florida Everglades. Ph.D. Thesis. Thesis Committee: George Aiken and Michael Reddy, U.S. Geological Survey; Diane McKnight, Civil, Environmental, and Architectural Engineering; Kathryn Nagy, Geological Sciences.
- Shanklin, B., 2006. Sources and Effects of Mining-Related and Natural Acid Rock Drainage Quantified Using Tracer Dilution, Coal Creek Watershed, Gunnison County, Colorado. M.S. Thesis. Thesis Committee: Natalie Mladenov, Institute of Arctic and Alpine Research; JoAnn Silverstein, Civil, Environmental, and Architectural Engineering.
- Sueker J.K., 1996. Isotopic and Chemical Flowpath Separation of Streamflow during Snowmelt and Hydrogeological Controls of Surface-Water Chemistry in Six Alpine-Subalpine Basins, Rocky Mountain National Park, Colorado. Ph.D. Thesis. Thesis Committee: Jill Baron, Colorado State University; Robert Jarrett, U.S. Geological Survey; JoAnn Silverstein, Civil, Environmental, and Architectural Engineering; Mark Williams, Geography and Institute of Arctic and Alpine Research.
- Turner N., 2005. The Effect of Desorption Kinetics on the Colloid-Facilitated Transport of Cesium-137 and Strontium-90 in a Saturated Quartz Porous Medium. M.S. Thesis. Thesis Committee: Hari Rajaram, Civil, Environmental, and Architectural Engineering.
- Wood A.R., 2004. Characterization and Prioritization of Mining-Related Metal Sources with Metal Loading Tracer Dilution Tests, and a Review of Regulations and Mine Restoration Funding Resources, Lefthand Creek Watershed, Northwestern Boulder County, Colorado. M.S. Thesis, Environmental Studies Program. Thesis Committee: Jason Neff, Geological Sciences; Victor Ketellaper, U.S. Environmental Protection Agency.
- Writer, J.H., 2010. Effect of the Epilithon on Removal Processes That Govern Steroidal Hormone and Alkylphenol Fate and Transport in Surface Waters. Ph.D. Thesis. Thesis Committee: Larry Barber, U.S. Geological Survey; Diane McKnight and Scott Summers, Civil, Environmental, and Architectural Engineering; Alan Vajda, University of Colorado Denver.
- Dehart, J., B.A. honors thesis in progress. Screening of contaminants in hydraulic fracturing fluids.
- Poulin, B., M.S. thesis in progress. Effect of soil flooding on mercury mobilization.
- Webster, J. Ph.D. thesis in progress. Effect of fire on the transport of mercury in forest soils.

STUDENT AWARDS

- Shantal Tummings, 2015 Society for Advancement of Chicanos/Hispanics and Native Americans in Science National Meeting, Outstanding Oral Poster Presentation, Washington, DC, October 29-31, 2015.
- Brett Poulin, 2014 Pathfinder Fellowship, Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI) (\$4,985; support for travel to and sampling at field sites), January 2015-January 2016.
- Jessica Dehart Rogers, Science to Achieve Results (STAR) Fellowship, U.S. Environmental Protection Agency (graduate research stipend, tuition, and research expenses), September 2012-June 2014.
- Jackson Webster, Everglades Foundation Fellowship (\$5,000; support for field sampling), December 2012.
- Jackson Webster, National Park Service George Melendez Wright Climate Change Fellowship (\$20,000; support for research involving mercury deposition at Mesa Verde National Park), May 2011.
- Sanjay Mohanty, Rich Herbert Memorial Scholarship, American Water Resources Association, Colorado Section (\$1,500), September 2008.
- Christopher Dodge, First Place for Environmental Research, Discovery Learning Apprentice Symposium, College of Engineering and Applied Science, University of Colorado at Boulder, April 2008.
- Sanjay Mohanty, Beverly Sears Graduate Research Award, Graduate School, University of Colorado at Boulder (\$1,000), April 2008.
- Hallie Bevan, First Place for Environmental Research, Discovery Learning Apprentice Symposium, College of Engineering and Applied Science, University of Colorado at Boulder, April 2007.
- Hallie Bevan, Provost Award for Achievement, University of Colorado at Boulder (\$1,000), 2006.

Ned Turner, Graduate Assistantships in Areas of National Need, Department of Education (stipend and tuition), 2003-2005.

Alice Wood, Ohana Scholarship, University of Colorado (full tuition, two semesters), 2003-2004.

Nicole DeNovio, Geological Society of America Research Grant (\$2,765 research funds), cited for “exceptional merit in conception and presentation,” Geological Society of America, 2003.

Sabre Duren, Undergraduate Research Opportunity Award (\$1,200 research funds), University of Colorado, 2001.

Hanna Gilbert, Undergraduate Research Opportunity Award (\$1,000 research funds), University of Colorado, 1999.

Mahalingam Ravichandran, Graduate Student Paper Award, American Chemical Society, Environmental Chemistry Division, 1998.

Mahalingam Ravichandran, Outstanding Student Paper Award, American Geophysical Union, Hydrology Section, Spring Meeting, 1998.

Jonathan P. Loveland, Allen Fellowship (\$3,000), Department of Civil, Environmental, and Architectural Engineering, University of Colorado, 1998.

Jonathan P. Loveland, Graduate Assistantship in Areas of National Needs Fellowship (full stipend and tuition), Department of Education, 1997.

Christine M. Hawley, Graduate Assistantship in Areas of National Needs Fellowship (full stipend and tuition), Department of Education, 1995.

Christine M. Hawley, Allen Fellowship (\$3,000), Department of Civil, Environmental, and Architectural Engineering, University of Colorado, 1995.

Julie K. Sueker, Horton Hydrology Research Grant (\$10,000 research funds), American Geophysical Union, 1995.

OUTREACH SERVICE

Technical Advisor, *Hardrock Revision*, Colorado Art Ranch, Lake City, Colorado, 2011-present.

Technical Advisor, Lefthand Watershed Oversight Group, Boulder County, Colorado, 2002-present.

Technical Advisor, Coal Creek Watershed Coalition, Crested Butte, Colorado, 2005-present.

Board Member, Boulder Creek Watershed Initiative, September 2007-2010.

Board Member, Colorado Riparian Association, 2005-2008.

Member, Colorado Non-Point Source Council Mining Sub-Committee, Division of Reclamation, Mining, and Safety, Department of Natural Resources, State of Colorado, 2002-2007.

Member, Stream Restoration Team, James Creek Watershed Initiative, 2002-2009.

Member, Colorado Nonpoint Source Council, 2004-2005.

Member, Turbidity Study Advisory Group, James Creek Watershed Initiative, 2000-2002.

Field Sampling Supervisor, National Association of Black Environmentalists, Denver, Colorado, 1999-2000.

PROFESSIONAL ACTIVITIES

Member of Scientific Societies

Association of Environmental Engineering and Science Professors, 1993 to present

Publications Committee, 2001-2002

Chair, Graduate Register Subcommittee, 2001-2002

Newsletter Editor, 2009-2012

American Geophysical Union, Hydrology Section, 1988-present

Groundwater Committee, 1998-1999

Water Quality Committee, 2000-2001

American Chemical Society, Environmental Chemistry Division, 1990-present

Journal Review and Editing

Guest Editor, *Environmental Science & Technology*, Special Issue on Nanoparticles, Metals, and Dissolved Organic Matter, September 2010-January 2011.

Associate Editor, *Water Resources Research*, 2004-2008.

Guest Editor, *Water Resources Research*, special section on “Colloid Transport in Subsurface Environments,” March 2005-September 2006.

Guest Editor, *Environmental Science & Technology*, Commemorative Issue for Charles R. O'Melia, December 2004-June 2005.

Proposal Review

Cooperative Institute for Coastal and Estuarine Environmental Technology, University of New Hampshire
Marsden Fund, New Zealand
National Science Foundation
 Engineering Directorate, Bioengineering and Environmental Systems Program
 Geosciences Directorate, Hydrologic Sciences Program
 Biocomplexity in the Environment Program
 Environmental Geochemistry and Biogeochemistry Program
 International Program
Ohio Sea Grant College Program
Swiss National Science Foundation
University of Illinois Institute for Environmental Studies
University of Wisconsin Sea Grant Institute/University of Wisconsin Water Resources Institute

Panel Reviews

U.S. Department of Energy, Environmental Management and Science Program, 2010
National Science Foundation, Environmental Engineering Program, 2010
U.S. Department of Energy, Environmental Management and Science Program, 2002
National Science Foundation, Environmental Geochemistry and Biogeochemistry Program, 1997
U.S. Department of Energy, Environmental Management Program, 1997
Texas Higher Education Coordinating Board, 1995

Conference and Conference Session Organization and Moderation

Hydraulic Fracturing, 2012 Sustaining Colorado Watershed Conference, Colorado Watershed Assembly, Avon, Colorado, October 2012.
Nano- to Field-Scale Processes Governing the Transport of Microbes and Colloids in the Subsurface, Geological Society of America Annual Meeting, October 2005, with William P. Johnson, University of Utah.
Cleaning Up Abandoned Hard Rock Mines in the West: Prospecting for a Better Future, a Center of the American West Workshop, October 21-23, 2004, with Prof. Patricia Nelson Limerick, University of Colorado at Boulder.
Interfacial Processes in the Water Environment, American Chemical Society 75th Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, Pennsylvania, June 2001.
Water Quality of Hydrologic Systems, American Geophysical Union Spring 2000 Meeting, May 2000, with Aaron Packman, Drexel University.
Transport of Microorganisms in the Subsurface Environment, Special Session, American Geophysical Union Fall 1999 Meeting, December 1999, with Ronald W. Harvey, U.S. Geological Survey.
Virus Inactivation, International Symposium on Subsurface Microbiology, American Society of Microbiology, Vail, Colorado, August 1999.
Transport of Microorganisms and Abiotic Colloids through Saturated Subsurface Materials, Special Session, American Geophysical Union Fall Meeting, December 1997, with Ronald W. Harvey, U.S. Geological Survey.
Colloidal and Interfacial Phenomena in Aquatic Environments, 209th National Meeting, American Chemical Society, Anaheim, California, April 1995.
Use of Field Experiments for Assessing Microbiological and Chemical Processes in Aquifers, Special Session, American Geophysical Union Fall Meeting, December 1995, with Ronald W. Harvey, U.S. Geological Survey.
Physical-Chemical Processes Controlling Contaminant Mobility in Aquatic Environments, 207th National Meeting, American Chemical Society, Anaheim, California, March 1994.
Groundwater Sampling Workshop, U.S. Environmental Protection Agency, Dallas, Texas, November 1993.

External Thesis Committee Member

Tonya Bird, Ph.D., Department of Chemical Engineering, Yale University, New Haven, Connecticut, April 2007.
Charlotte Kjærsgaard, Ph.D., Department of Environmental Engineering, Institute of Life Sciences, Aalborg University, Aalborg, Denmark, October 2003.