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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, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder, May 2004 to present

Program Faculty, Environmental Engineering Program, College of Engineering and Applied Science, University of Colorado Boulder, 1998 to present

PAST POSITIONS

Director, Environmental Engineering Undergraduate Degree Program, College of Engineering and Applied Science, University of Colorado at Boulder, 2001 to 2006; 2012 to 2013; 2021 to 2022 (interim)

Faculty Director, AirWaterGas Sustainability Research Network (www.airwatergas.org), University of Colorado Boulder, 2012 to 2019

Visiting Lecturer, Department of Environmental Resources Engineering, Humboldt State University, August to December 2018

Bennett-Lindstedt Faculty Fellow, College of Engineering and Applied Sciences, University of Colorado Boulder, 2013 to 2018.

Erskine Fellow, Department of Civil and Natural Resources Engineering, University of Canterbury, Christchurch, New Zealand, July to November 2008

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

REFEREED JOURNAL ARTICLES (students and postdoctoral research associates in **bold**; total: 93; *h*-index: 61 Google Scholar)

Lackey G., Pfander I., Gardiner J., Sherwood O.A., Rajaram H., Ryan J.N., Dilmore R.M., and Thomas B. (2022) Composition and origin of surface casing fluids in a major US oil- and gas-producing region. *Environmental Science & Technology*, doi:10.1021/acs.est.2c05239.

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Lackey G., Rajaram H., Sherwood O.A., Ryan J.N., Bromhal G., and Dilmore R.M., 2021. Public data from three US states provides new insights into well integrity. *Proceedings of the National Academy of Sciences* **118**(14), e2013894118; doi:10.1073/pnas.2013894118.

Stanish L.F., Sherwood O.A., Lackey G., Osborn S.G., Robertson C.E., Harris J.K., Pace N., and Ryan J.N., 2020. Microbial and biogeochemical indicators of methane in groundwater aquifers of the Denver Basin, Colorado. *Environmental Science & Technology*; doi:10.1021/acs.est.0c04228.

Poulin B.A., Ryan J.N., Tate M.T., Krabbenhoft D.P., Hines M.E., Barkay T., Schaefer J., and Aiken G.R., 2019. Geochemical factors controlling dissolved elemental mercury and methylmercury formation in Alaskan wetlands of varying trophic state. *Environmental Science & Technology* **53**(11), 6203-6213; doi:10.1021/acs.est.8b06041.

Rogers J.D., Thurman E.M., Ferrer I., Rosenblum J.S., Evans M.V., Mouser P.J., and Ryan J.N., 2019. Degradation of polyethylene glycols and polypropylene glycols in microcosms simulating a spill of produced water in shallow groundwater. *Environmental Science*: *Processes and Impacts* **21**, 256-268; doi:10.1039/C8EM00291F.

Entrekin S., Trainor A., Saiers J., Patterson L., Maloney K., Fargione J., Kiesecker J., Baruch-Mordo S., Konschnik K., Wiseman H., Nicot J.-P., and Ryan J.N., 2018. Water stress from high-volume hydraulic fracturing potentially threatens aquatic biodiversity and ecosystem services in Arkansas, U.S.A. *Environmental Science & Technology* **52**(4), 2349–2358; doi:10.1021/acs.est.7b03304.

Barrett P.M., Hull E.A., King C.E., Burkart K., **Ott K.A.**, Ryan J.N., Gawel J.E., and Neumann R.B., 2018. Increased exposure of plankton to arsenic in contaminated weakly-stratified lakes. *Science of the Total Environment* **625**, 1606-1614; doi:10.1016/j.scitotenv.2017.12.336.

Poulin B.A., **Gerbig C.A.**, Kim C.S., Stegemeier J.P., Ryan J.N., and Aiken G.R., 2017. Effects of sulfide concentration and dissolved organic matter characteristics on the structure of nanocolloidal metacinnabar. *Environmental Science & Technology* **51**(22), 13133-13142; doi:10.1021/acs.est.7b02687.

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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.

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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.

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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

University of British Columbia, British Columbia Water & Waste Association Student Chapter and Environmental Engineering Program, "Water in Mining," a session at the World Water Day Celebration, remote panel discussion with Profs. Nadja Kunz and Wenying Lui (University of British Columbia), March 23, 2021.

Colorado School of Mines, Civil and Environmental Engineering Department, "Effect of Fire on the 'Biogeochemical Axis of Evil' of Mercury, Sulfur, and Organic Matter," Golden, Colorado, seminar presentation, January 31, 2020.

American Society of Civil Engineers, North Coast Branch, "Oil and Gas Development and Groundwater Quality in Colorado's Denver-Julesburg Basin," Eureka, California, seminar presentation, November 8, 2018.

Humboldt State University, Department of Environmental Resources Engineering, "The Road to Jericho: Abandoned Mines, the Clean Water Act, and Environmental Good Samaritans," seminar presentation, November 2, 2018.

Colorado Environmental Management Society, "Air, Water, Oil, and Gas -- Balancing Resources and Impacts of Oil and Gas Development in Colorado," Denver, Colorado, seminar presentation, May 8, 2018.

Dawson School, "Oil and Gas Development: Effects on Front Range Air and Water," community presentation with Lisa McKenzie and Jana Milford, Boulder, Colorado, presentation and panel discussion, April 26, 2018.

Paonia Science Symposium, "Oil and Gas, Air and Water," community presentation at high school science symposium, Paonia Colorado, April 11, 2018.

Colorado Municipal League, "AirWaterGas: Who We Are and How We Can Help Municipalities with Oil and Gas Development," webinar with Michael Hannigan, Tanya Heikkila, and Kathryn Mutz, Denver, Colorado, April 9, 2018.

Rocky Mountain Association of Environmental Professionals, "Investigating the Effects of Oil and Gas Development on Water Quality in Colorado," Golden, Colorado, February 22, 2018.

Escuela Bilingüe Pioneer Parent-Teacher Association, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," community meeting with Stephanie Malin and Lisa McKenzie, Lafayette, Colorado, January 8, 2018.

CU on the Weekend, "AirWaterGas: Effects of Oil and Gas Development on Air and Water Quality in Colorado," community presentation with Gabrielle Pétron and Harihar Rajaram, Boulder, Colorado, October 14, 2017.

University of California Los Angeles, Department of Civil and Environmental Engineering, "When Water and Oil are Mixed: Effects of Oil and Gas Development on Water Quality in Colorado's Denver-Julesburg Basin," seminar presentation, May 11, 2017.

City and County of Broomfield, Comprehensive Planning Committee, "Environmental, Economic, and Social Effects of Oil and Gas Development in Colorado," March 23, 2017.

Anthem Ranch 55+ Community, City of Broomfield, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," presentation and panel discussion to 250 residents, January 6, 2017.

County of Boulder, Department of Public Health, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," December 7, 2016.

Wild Grass Community, City of Broomfield, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," November 3, 2016.

State of Colorado, Department of Public Health and Environment, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," November 3, 2016.

Northwestern University, Water Energy Climate Conference, "Oil and Water: Unconventional Oil and Gas Development, Water Use, and Water Quality," October 13, 2016, Evanston, Illinois.

State of Colorado, Department of Natural Resources, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," October 5, 2016.

Town of Paonia, Colorado, State of the North Fork River, "Effects of Oil and Gas Development on Groundwater Quality in Colorado," August 23, 2016.

Anadarko Petroleum Corporation, "Groundwater Quality and Oil and Gas Development: What We Have Learned from Public Databases," May 12, 2016, Denver, Colorado.

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 Mexicio, 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

"CU-Boulder-led Team Melds Oil and Gas Research, Public Policy," October 13, 2018, Boulder Daily Camera, Cassa Niedringhaus, interview, http://www.dailycamera.com/cu-news/ci_32204887/cu-boulder-led-team-melds-oil-and-gas.

"The Big Questions on Your November 2018 Ballot in Colorado," August 23, 2018, *The Colorado Independent*, Corey Hutchins, interview, https://www.coloradoindependent.com/2018/08/23/colorado-ballot-measures-2018/.

"Fracking an Unlikely Culprit for Northern Colorado Groundwater Contamination," July 12, 2016, interview and audio on Colorado Public Radio, http://www.cpr.org/news/newsbeat/methane-study-fracking-unlikely-culprit-n-colorado-groundwater-contamination.

"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 Adrianne 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.

AWARDS

External

Outstanding Reviewer, *Environmental Science: Processes & Impacts*, 2018, Royal Society of Chemistry

"Best of the Best 2015", *Environmental Science & Technology Letters*, for "A Framework for Identifying Organic Compounds of Concern in Hydraulic Fracturing Fluids Based on Their Mobility and Persistence in Groundwater" by J.D. Rogers, T.L. Burke, S.G. Osborn, and J.N. Ryan, 2015, *Environmental Science & Technology Letters* **2**(6), 158-164, doi:10.1021/acs.estlett.5b00090.

Distinguished Service Award, 2012, Association of Environmental Engineering and Science Professors, for outstanding service as editor of the *AEESP Newsletter*.

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.

Internal

Research Development Awards, 2013 and 2001, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder.

Outstanding Faculty Advisor Award, 2010, College of Engineering and Applied Science, University of Colorado Boulder.

Distinguished Achievement Award, 2009, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder.

Teaching Awards, 2008 and 2004, Department of Civil, Environmental, and Architectural Engineering, University of Colorado Boulder.

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

CURRENT RESEARCH SUPPORT, EXTERNAL AND INTERNAL

Assessing the Effects of Unconventional Oil and Gas Development on Community Water Sources. Health Effects Institute:Energy (RF-02), February 2022 to January 2023. PI: J.N. Ryan ($82,375), co-PIs: J. Adgate, University of Colorado Anschutz ($84,431) and H. Rajaram, John Hopkins University ($83,194).

Investigation of the Effects of Organic Matter and Sulfur on the Environmental Fate of Mercury. National Science Foundation, Earth Sciences Division, Geobiology and Low-Temperature Geochemistry (EAR-1629698), January 2017 to December 2021, PI: J.N. Ryan ($288,200), co-PIs: K.L. Nagy, University of Illinois at Chicago and B.A. Poulin, U.S. Geological Survey.

PAST EXTERNAL RESEARCH SUPPORT

Road-Mapping for Mining and Industrial Sectors, National Alliance for Water Innovation, U.S. Department of Energy, July 2020- June 2021, PI: Karl Linden, University of Colorado Boulder; co-PI: J.N. Ryan ($25,000).

RAPID Collaborative Proposal: Characterization of Upland Watershed Contamination from Wildland-Urban Burning, National Science Foundation, Chemical, Bioengineering, Environmental, and Transport Division, Environmental Engineering Program (CBET-1917165), February 1, 2019, to April 30, 2021, PI: Jackson Webster, California State University at Chico, co-PI: J.N. Ryan ($10,000).

Refining a Database of Produced Water Chemical Constituents. Environmental Defense Fund, Boulder, Colorado; June 2018 to April 2021, PI: J.N. Ryan ($45,000).

Effects of Oil and Gas Development on Groundwater Quality in Eastern Boulder County: Baseline Monitoring and Post-Drilling Changes. Boulder County Public Health Department, June 2017 to December 2018, PI: J.N. Ryan ($199,500).

Effects-Related Biomarkers of Environmental Neurotoxic Exposures. National Institute of Environmental Health Science, Superfund Basic Research Program (P42ES004696), April 1, 2015 to March 30, 2017, PI: E.P. Gallagher, co-PI: R.B. Neumann, University of Washington Seattle. co-PI: J.N. Ryan ($107,162).

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, 2019, PI: J.N. Ryan, co-PIs: M. Williams and M. Hannigan, University of Colorado Boulder ($11,999,328; nine institutions, 27 investigators).

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

Oil and Gas Contamination of Jackson County Waters. University of Colorado Boulder, Office of Outreach and Engagement, July 1, 2019 to June 30, 2022, PI: J.N. Ryan ($8,000).

Integrating Water Quality Monitoring with Stakeholders in CVEN 5404 Water Chemistry. University of Colorado Boulder, CU Engage Faculty Fellows in Community-Based Learning, July 1, 2019 to June 30, 2020, PI: Joe Ryan ($4,000).

Tribal College Citizen Science Assessing Oil Boom Risks. University of Colorado Boulder, Office of Outreach and Engagement, July 1, 2016-June 30, 2018, PI: J. Shannon, co-PI: J.N. Ryan ($16,000).

Assessing Drinking Water Quality on Colorado's Western Slope. University of Colorado Boulder, Office of Outreach and Engagement, July 1, 2016 to June 30, 2018; PI: J.N. Ryan ($8,000).

Assessing the Effects of Natural Gas Production on Water Quality in Garfield County, Colorado: A Collaboration with Garfield County, Colorado. University of Colorado Boulder, Office of Outreach and Engagement, 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, Office of Outreach and Engagement, July 2011-June 2012, PI: J.N. Ryan ($8,000).

Colorado Water and Energy Research Center. University of Colorado Boulder, Office of Outreach and Engagement, July 2010 to June 2012, PI: Mark Williams, co-PI: J.N. Ryan ($50,000).

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 Boulder, Office of Outreach and Engagement, July 2008 to June 2010, PI: J.N. Ryan ($16,000).

Investigating the Fate and Transport of Endocrine-Disrupting Chemicals in Natural Waters. Innovation 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 Boulder, Office of Outreach and Engagement, 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 Boulder, Office of Outreach and Engagement, 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 Boulder, Office of Outreach and Engagement, 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 Boulder, Office of Outreach and Engagement, 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 Boulder, Office of Outreach and Engagement, 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 Boulder, Office of Outreach and Engagement, 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 Artifactual 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, three semesters

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

CVEN 5404 *Water Chemistry*, graduate level, many semesters

CVEN 5424 *Environmental Organic Chemistry*, many semesters

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

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

CVEN 6414 *Aquatic Surfaces and Particles*, graduate level, surface chemistry and colloid chemistry, five semesters

EVEN 1000 *Introduction to Environmental Engineering*, undergraduate level, many semesters

EVEN 4100 *Environmental Sampling and Analysis*, undergraduate level, six semesters

EVEN 4424 *Environmental Organic Chemistry*, many 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

ENGR 351 *Introduction to Water Quality*, undergraduate level, Department of Environmental Resources Engineering, Humboldt State University, Arcata, California.

ENGR 481 *Environmental Sampling and Analysis*, undergraduate level, Department of Environmental Resources Engineering, Humboldt State University, Arcata, California.

EAS 648B *Colloids, Biocolloids, and Colloid-Facilitated Transport in the Subsurface Environment*, Department of Chemical Engineering, Yale University, Spring 2001

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.

TEACHING SUPPORT

Integrating Water Quality Monitoring with Stakeholders in CVEN 5404 Water Chemistry: A Collaboration with the Lefthand Watershed Oversight Group. CUEngage Program, University of Colorado Boulder, July 1, 2019 to June 30, 2020, $4,000, PI: J.N. Ryan.

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, northwestern 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* öocysts and microspheres to limestone and the transport of *Cryptosporidium parvum* öocysts 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.

Poulin, B.A., 2016. Investigations of redox-dependent processes involving mercury, sulfur, and dissolved organic matter. Ph.D. Thesis. Thesis Committee: George Aiken, U.S. Geological Survey; Diane McKnight and Jason Ren, Civil, Environmental, and Architectural Engineering; Alexis Templeton, Geological Sciences.

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.

Rogers J.D., 2017. Groundwater fate and transport of hydraulic fracturing organic compounds. Ph.D. Thesis. Thesis committee: Angela Bielefeldt, Harihar Rajaram, Fernando Rosario-Ortiz, and E. Michael Thurman, Civil, Environmental, and Architectural Engineering, University of Colorado Boulder; and Owen Sherwood, Institute for Arctic and Alpine Research, University of Colorado Boulder.

Schroeder M.T., 2018. Benzene, toluene, ethylbenzene, and xylenes occurrence in relation to oil and gas development in the Denver-Julesburg Basin of Colorado. M.S. thesis. Thesis committee: Gregory Lackey and Roseanna Neupauer, Civil, Environmental, and Architectural Engineering, University of Colorado Boulder.

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.

Stults J.F., 2018. Are hydraulic fracturing jobs getting greener? An integrated approach to risk analysis and data analytics using the FracFocus database. M.S. thesis. Thesis committee: Gregory Lackey and Fernando Rosario-Ortiz, Civil, Environmental, and Architectural Engineering, University of Colorado Boulder.

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.

Webster, J.P., 2015. Effects of wildfire on mercury, organic matter, and sulfur in soils and sediments. Ph.D. thesis. Thesis committee: George Aiken, U.S. Geological Survey; Diane McKnight and Fernando Rosario-Ortiz, Civil, Environmental, and Architectural Engineering; and Alexis Templeton, Geological Sciences.

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.

STUDENT AWARDS

Grady Colgan (Environmental Engineering B.S., 2022) Harlan Ecker Memorial Scholarship, Colorado Groundwater Association, Denver, Colorado ($2,500), 2022.

Lauren Magliozzi (Environmental Engineering Ph.D. candidate) George Aiken Memorial Fellowship, Center for Water Environment Science and Technology, University of Colorado Boulder ($7,000), 2020-2021.

Erica Wiener (Environmental Engineering B.S., 2016) National Science Foundation Graduate Research Traineeship, 2017-2019.

John Stults, Dean's Grant Award, Beverly Sears Graduate Student Program Grant, University of Colorado Boulder, ($5,000), March 2017.

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) ($5,000; 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 Loveland, Allen Fellowship ($3,000), Department of Civil, Environmental, and Architectural Engineering, University of Colorado, 1998.

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

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

Christine Hawley, Allen Fellowship ($3,000), Department of Civil, Environmental, and Architectural Engineering, University of Colorado, 1995.
Julie 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, 2011-2013.
Technical Advisor, Left Hand Watershed Center, Boulder County, Colorado, 2002-2011 and 2020 to present.
Technical Advisor, Coal Creek Watershed Coalition, Crested Butte, Colorado, 2005-2008.
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.

CONSULTING

Technical Advisor, Left Hand Watershed Center, Boulder County, Colorado; review of remediation activities at the Captain Jack Mill Superfund site, Ward, Colorado, 2020 to present.
Expert Witness, Washington State Office of the Attorney General, Olympia, Washington; review of technical documents and laboratory tests examining release of metals from Columbia River slag deposits for Pakootas v Teck Cominco Metals, Ltd., No. 16-35742 (9th Cir. 2018), 2009-2011.
Technical Advisor, Standard Mine Technical Advisory Group, Crested Butte, Colorado; review of remediation activities at the Standard Mine near Crested Butte, Colorado, 2008-2009.
Technical Advisor, Lefthand Creek TAG Coalition, Boulder County, Colorado; review of remediation activities at the Captain Jack Mill Superfund site, Ward, Colorado, 2006-2009.

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
    - Recipient of Distinguished Service Award for Outstanding Service, 2012
  - Mentor, Junior Faculty Mentorship Program, 2018-2019
  - Reviewer, SSC Academic Job Application Review, 2020
- American Geophysical Union, Hydrology Section, 1988-present
  - Groundwater Committee, 1998-1999
  - Water Quality Committee, 2000-2001
- American Chemical Society, Environmental Chemistry Division, 1990-present

Editorships
- *Environmental Science: Advances*, Associate Editor, 2020-2022
- *Frontiers in Environmental Chemistry*, Associate Editor, 2020
- *Water Resources Research*, Associate Editor, 2010-2012

Panel Reviews
- National Science Foundation, Chemical, Bioengineering, Environmental, and Transport Systems, Environmental Engineering Program, May 13-14, 2020
- U.S. Department of Defense, Strategic Environmental Research and Development Program, ERSON-21-C2, April 2020
- 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

Advisory Boards
- Advisory Board member for National Science Foundation grant "Hazards SEES: The Risk Landscape of Earthquakes Induced by Deep Wastewater Injection," PIs: Abbie Liel, Anne Sheehan, and Liesel Ritchie, University of Colorado Boulder.

Conference and Conference Session Organization and Moderation
- "Sources, Fate, and Transport of Metals, Metalloids, and Rare Earth Elements in Surface Waters," 2017 American Geophysical Union Fall Meeting, with Robert L. Runkel and Jeffrey Nason, December 11-15, 2017,
- "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, with William P. Johnson, University of Utah, October 2005.

"Cleaning Up Abandoned Hard Rock Mines in the West: Prospecting for a Better Future," Center of the American West Workshop, with Prof. Patricia Nelson Limerick, University of Colorado at Boulder, October 21-23, 2004.

"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, with Aaron Packman, Drexel University, May 2000.

"Transport of Microorganisms in the Subsurface Environment," American Geophysical Union Fall 1999 Meeting, with Ronald W. Harvey, U.S. Geological Survey, December 1999.

"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," 1997 American Geophysical Union Fall Meeting, with Ronald W. Harvey, U.S. Geological Survey, December 1997.

"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," 1995 American Geophysical Union Fall Meeting, with Ronald W. Harvey, U.S. Geological Survey, December 1995.

"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.