

HEI Research Planning Workshop

Understanding Population-Level Exposures Related to the Development of Oil and Natural Gas from Unconventional Resources

Denver, CO
July 11-12, 2018

SPEAKER BIOGRAPHIES

John L. Adgate

Dr. Adgate is Professor and Chair of the Department of Environmental and Occupational Health at the Colorado School of Public Health. His research on exposure science, risk analysis, and children's environmental health has focused on improving exposure estimation in epidemiologic studies by documenting the magnitude and variability of human exposures to chemical and biological stressors. He has taught or co-taught graduate level courses in environmental health, risk analysis, occupational safety and ergonomics, and advanced methods in exposure science. Dr. Adgate has served on multiple science advisory panels for the U.S. Environmental Protection Agency as well as National Research Council and Institute of Medicine committees exploring technical and policy issues related to residential exposure to pesticides and air pollutants, impacts of energy development, lead exposure interventions, children's environmental health, the impacts of climate change on indoor air quality. He received a BS from Calvin College, an MSPH degree in environmental science from the School of Public Health of the University of North Carolina at Chapel Hill, and a PhD degree in environmental health sciences granted jointly by the University of Medicine and Dentistry of New Jersey and Rutgers University. His current funded research focuses on the risks, health, and community impacts of oil and gas development; the impact of residential weatherization and wildfires on indoor environments; and health effects stemming from perfluoroalkyl chemical (PFAS) exposure.

David T. Allen

Dr. Allen is the Gertz Regents Professor of Chemical Engineering, and the Director of the Center for Energy and Environmental Resources, at the University of Texas at Austin. He is the author of seven books and over 250 papers, primarily in the areas of urban air quality, the engineering of sustainable systems, and the development of materials for environmental and engineering education. Dr. Allen has been a lead investigator for multiple air quality measurement studies, which have had a substantial impact on the direction of air quality policies. He directs the Air Quality Research Program for the State of Texas, and he is the founding Editor-in-Chief of the American Chemical Society's journal ACS Sustainable Chemistry & Engineering. He has developed environmental educational materials for engineering curricula and for the University's core curriculum, as well as engineering education materials for high school students. He led the development of a year-long high school engineering course, Engineer Your World, which is used in hundreds of high schools nationwide. The quality of his work has been recognized by the National Science Foundation, the AT&T Foundation, the American Institute of Chemical Engineers, the Association of Environmental Engineering and Science Professors, and the State of Texas; he was elected to the National Academy of Engineering in 2017. He has served on a variety of governmental advisory panels and from 2012 to 2015 chaired the U.S. Environmental Protection Agency's Science Advisory Board. He has won teaching awards at the University of Texas and UCLA and the Lewis Award in Chemical Engineering Education, from the American Institute of Chemical Engineers. Dr. Allen received his B.S. degree in Chemical Engineering, with distinction, from Cornell University in 1979. His M.S. and Ph.D. degrees in Chemical Engineering were awarded by the California Institute of Technology in 1981 and 1983. He has held visiting faculty appointments at the California Institute of Technology, the University of California, Santa Barbara, and the Department of Energy.

Tiffany Bredfeldt

Dr. Bredfeldt is a Senior Toxicologist at the Texas Commission on Environmental Quality where she focuses on human health risk assessment, generation of toxicity factors, and NexGen risk assessment approaches. Her office has been active in evaluating ambient air quality from a human health perspective for VOCs, PAHs, carbonyls, and metals. Her responsibilities include serving on national panels that influence the future of the use of toxicology data in human health risk assessment. A significant portion of her time is dedicated to participating in public policy and outreach events where she both represents the State of Texas and also educates the public about environmental health issues. Dr. Bredfeldt received her Ph.D. in Pharmacology and Toxicology from the University of Arizona where her research focused on the carcinogenicity of arsenic metabolites and their underlying mechanisms of action. This research into the mechanisms of arsenic-induced carcinogenesis was published in various peer-reviewed journals and was acknowledged through awards from the Society of Toxicology and the National Institute of Environmental Health Sciences (NIEHS), including the 2005 Karen Wetterhahn Memorial Award. Upon completion of her doctoral studies, she conducted postdoctoral research at the University of Texas M.D. Anderson Cancer Center, where she was the recipient of a NIEHS Ruth L. Kirschstein National Research Service Award. Dr. Bredfeldt's postdoctoral research investigated the mechanisms by which early life exposure to endocrine disrupting chemicals called xenoestrogens increased cancer risk in adulthood by modulation of epigenetic structures.

Jeffrey L. Collett, Jr.

Dr. Collett is Professor and Head of the Department of Atmospheric Science at Colorado State University. Dr. Collett's research interests include pollution processing by clouds and fogs, nitrogen deposition, aerosol chemistry, air quality impacts from unconventional oil and gas development, emissions from wild and prescribed fires, precipitation chemistry and physics, dew chemistry, bi-directional exchange of ammonia between the atmosphere and surface, regional air quality, aerosol impacts on visibility, and instrument development. Recent studies have characterized (1) emissions of air toxics, ozone precursors, and methane from specific processes (drilling, fracking, flowback, and production) associated with unconventional oil and gas development, (2) the increasing contributions of ammonia to reactive nitrogen deposition in the Rocky Mountain region and across the U.S., (3) contributions of biomass burning to reactive nitrogen and brown carbon, (4) the organic chemistry of clouds and fogs, (5) impacts of oil and gas development on fine particle and haze formation in the Bakken oil patch, (6) the role of dew as a temporary, nighttime reservoir for atmospheric ammonia, and (7) international air quality issues in China and Korea. Dr. Collett received an S.B. in Chemical Engineering from MIT and M.S. and Ph.D. degrees in Environmental Engineering Science from Caltech.

Isabelle Cozzarelli

Dr. Cozzarelli received her PhD from the University of Virginia in 1993. As a geochemist in the United States Geological Survey's Water Mission Area she conducts long-term interdisciplinary research on the environmental fate and effect of organic contaminants such as fuels and fuel waste products. She has over 100 published research papers. Throughout her career she has committed herself to mentoring students and junior scientists in the field and in her laboratory in Reston Virginia. She currently serves as Team Leader of the USGS Toxics Program project on Fate and Effects of Wastes from Unconventional Oil and Gas Development. Dr. Cozzarelli has an adjunct faculty position at Virginia Tech and was elected GSA Fellow in 2005.

Cloelle Danforth

Dr. Danforth is a Postdoctoral Science Fellow in the Environmental Defense Fund's Office of the Chief Scientist and has been working primarily with the Oil and Gas Team to minimize impacts of oil and gas development on surface and groundwater. She is currently involved in a two-pronged research effort: (1) to understand and improve oil and gas wastewater characterization techniques, and (2) to create viable,

fit-for-purpose biological treatment methodologies to remove organic constituents of concern. Dr. Danforth's research has largely focused at the intersection of microbiology and environmental engineering; meaning, she considers the role of microorganisms to meet a variety of environmental challenges and needs – primarily in the context of water and wastewater. Her work includes investigating a bacterium for bioremediation of a common groundwater contaminant and exploring reactor designs for microorganisms that are able to use electricity directly to produce fuel or fuel feedstock. This process is essentially synthetic photosynthesis and could someday be used to store intermittent energy (solar) in a form that can be used at need (liquid fuel). Dr. Danforth also spent two years working as a consulting engineer performing environmental investigations and remediation. She earned her B.S. in Engineering Science at Smith College and her M.S. and PhD in Civil & Environmental Engineering from Cornell University.

Shari Dunn-Norman

(See separate compilation of biographies for HEI's Energy Research Committee)

Michael Honeycutt, PhD

Dr. Honeycutt is the director of the Toxicology Division of the Texas Commission on Environmental Quality (TCEQ). His career at TCEQ began in 1996, and he has managed the division of 14 toxicologists since 2003. His responsibilities include overseeing (1) health effects reviews of air permit applications, (2) review of the results of ambient air monitoring projects, and (3) reviews of human health risk assessments for hazardous waste sites. Dr. Honeycutt spearheaded the updating of TCEQ's Effects Screening Levels (ESLs), or toxicity factors for chemicals. The TCEQ ESL derivation procedure has undergone two independent external scientific peer reviews and multiple rounds of public comment (<http://www.tceq.texas.gov/toxicology/esl/guidelines/about.html>). Dr. Honeycutt serves as a technical resource for TCEQ management and staff on issues concerning air and water quality, drinking water contamination, and soil contamination. He also serves as an expert witness in public and state legislative hearings, participates in public meetings, and has conducted hundreds of media interviews. Dr. Honeycutt is an adjunct professor at Texas A&M University, has published numerous articles in the peer-reviewed literature, serves or has served on numerous external committees, and has provided invited testimony at Congressional hearings. He was recently appointed chairman of USEPA's Science Advisory Board. Dr. Honeycutt received his Bachelor's degree and Ph.D. in Toxicology from the University of Louisiana at Monroe.

George Hornberger

(See separate compilation of biographies for HEI's Energy Research Committee)

Bradley King

Dr. King is an industrial hygienist at the National Institute for Occupational Safety and Health (NIOSH). He holds a BS in Biology from Loyola University New Orleans, an MPH in Environmental/Occupational Health from Saint Louis University, and a PhD in Environmental Health Science from Johns Hopkins University. He received his commission as an Environmental Health Officer in the U.S. Public Health Service in 2002, currently holding the rank of Captain (CAPT), and received his certification in the comprehensive practice of industrial hygiene in 2005. He joined NIOSH in 1999 in the Health Hazard Evaluation program in Cincinnati, Ohio, responding to requests from workers, employers, and union officials to evaluate occupational exposures at worksites across the country. Since 2013, he has worked in NIOSH's Western States Division in Denver, Colorado; current research interests include evaluating occupational exposures in the upstream oil and gas industry. Bradley currently serves as a Director on the Board of Directors for the American Industrial Hygiene Association.

Michael McCawley

Dr. McCawley graduated with a bachelor's degree in Zoology from George Washington University. He received his master's degree in Environmental Engineering from West Virginia University and a doctorate in Environmental Health from New York University. Dr. McCawley spent over 27 years as a Public Health Service Officer with the Centers for Disease Control and Prevention (CDC) at the National Institute for Occupational Safety and Health, studying miners' health, occupational respiratory disease, aerosol measurement and ultrafine particles. While there he worked on projects concerning exposure to wood dust, volcanic ash, diesels, coal mine dust, silica and beryllium. He retired from the US Public Health Service in 2001. He has taught at WVU since 1979, with primary interests in air pollution, aerosols and occupational health. He has developed air sampling equipment and a pulmonary function test. Recently, he has been working on issues related to Marcellus Shale drilling and mountain top mining.

Lisa McKenzie

Dr. McKenzie is an Assistant Research Professor at the Colorado School of Public Health (Colorado SPH) on the University of Colorado Denver's Anschutz Medical Campus. Her expertise is in exposure assessment, environmental epidemiology, and human health risk assessment. Dr. McKenzie's research has contributed to the understanding of how air pollutants and other exposures resulting from the unconventional development of petroleum resources may affect the public's health. Her sentinel human health risk assessment indicated the potential for respiratory, neurological, and developmental health outcomes resulting from exposure to air pollutants emitted during natural gas development. Her studies investigating associations between adverse birth outcomes and childhood cancers and proximity to oil and gas development are among the first epidemiological studies on this topic to appear in the published literature. She has testified before the United States Congress and the Denver Metropolitan Regional Air Quality Council on the public health implications of natural gas development. Prior to her current academic appointment, she was a senior scientist in the private sector leading multi-disciplinary teams of scientists across the United States in conducting human health risk assessments.

Robert O'Keefe

Mr. O'Keefe is responsible for management of key programs at HEI, including the Institute's global program to assess the health effects of air pollution in developing countries. He also provides leadership in implementing HEI's ongoing research and review programs on the health impact of particulates, ozone air toxics and other pollutants, and emerging technologies and fuels, including those driven by climate concerns. He oversaw the Institute's efforts to define and implement a program of research on Accountability, a first-of-its-kind program designed to understand the health impacts of environmental regulation. He is regularly called on to address prominent institutions, including the U.S. Congress, the European Parliament, the National Academy of Science's National Research Council and Institute of Medicine, and many other domestic and international bodies. In 2009 he was invited by the Woodrow Wilson Center to address its congressional forum as a "Scholar on the Hill." He is currently a member of the U.S. EPA's national Clean Air Act Advisory Committee and is Chair of the Board of Directors of Clean Air Asia. Before coming to HEI he served for nine years at the Massachusetts Department of Environmental Protection, as Assistant Deputy Commissioner for Policy and Program Development and as Director of Planning and Budget. Mr. O'Keefe played a significant role in gaining passage and funding for major state programs, including the Massachusetts State Superfund law, the Safe Drinking Water Program, and the design and funding of Massachusetts' implementation of the 1990 Clean Air Act amendments.

Adam Pacsi

Dr. Pacsi is an air quality and greenhouse gas emission researcher for the Chevron in the internal consulting and research division of the company. Adam is a chemical engineer by training, with a BS

from Tulane University in New Orleans and a PhD from the University of Texas at Austin. His doctoral research examined the air quality and water use changes associated with unconventional natural gas development in Texas and price-based changes in the electric power sector. For the last 3.5 years, Adam has worked with Chevron on a variety of projects related to methane emissions, environmental big data and analytics, and ambient air pollution measurement technologies.

Martha E. Rudolph

Ms. Rudolph is the Director of Environmental Programs for the Colorado Department of Public Health and Environment where she oversees the Air Quality, Environmental Health and Sustainability, Hazardous Materials and Waste Management, and Water Quality Divisions. Ms. Rudolph has been with the Department since 2007, and served as the Executive Director of the Department in 2010. In 2015/2016, Ms. Rudolph was President of the Environmental Council of States, the national non-profit, non-partisan association of state and territorial environmental agency leaders. She currently serves on the Board of Directors for the Environmental Research Institute of the States and is a co-chair of the ECOS Shale Gas Caucus. Previously Ms. Rudolph was the Chair of the ECOS Air Committee and the Vice Chair of the ECOS Planning Committee. She is a member of the Division on Earth and Life Studies of The National Academies of Sciences, Engineering, and Medicine, a state advisor for the Georgetown Climate Center, and a member of the American College of Environmental Lawyers. A graduate of the Georgetown University Law Center, Ms. Rudolph is an environmental attorney, and served for 14 years in the Colorado Attorney General's Office. She has been in private practice in Denver, and was an assistant general counsel for Kinder Morgan Inc., a natural gas and energy transportation company. Ms. Rudolph received her BA in International Affairs from the University of Colorado-Boulder and Doctor of Law degree from the Georgetown University Law Center.

Nichole Saunders

Ms. Saunders is an Attorney for EDF's US Climate and Energy Program, where she works on oil and natural gas regulation and policy. Her work is focused on minimizing impacts to water, land, and communities by improving state and federal policies and industry practices. Nichole joined EDF as a legal intern in 2013, working on water and waste issues associated with natural gas development. As a law student at the University of Tulsa College of Law, she studied sustainable energy and resources law and served as Student Editor-In-Chief of the Energy Bar Association's Energy Law Journal publication and Executive Editor of the American Bar Association's Section of Environment, Energy, and Resources Year-in-Review. Prior to earning her J.D., Nichole completed her M.S. and B.S. in Environmental Biology from Tulane University. She is a member of the State Bar of Texas and Texas Bar Association.

Daniel J. Soeder

Mr. Soeder is Director of the Energy Resources Initiative at South Dakota School of Mines & Technology in Rapid City, SD, USA. He joined SD Mines in May 2017 with eight years of experience as a research scientist at the Morgantown, WV campus of the U.S. Department of Energy (DOE) National Energy Technology Laboratory, where he investigated the environmental risks of unconventional oil and gas development, and 18 years as a hydrologist with the U.S. Geological Survey (USGS) studying groundwater contamination on the U.S. east coast, and nuclear waste isolation in Nevada. Prior to joining the USGS, he spent a decade with the Gas Technology Institute in Chicago, researching hydrocarbon production from unconventional resources. He also worked as a DOE contractor collecting and characterizing Eastern Gas Shale Project cores. He holds a BS from Cleveland State University, and an MS from Bowling Green State University (Ohio), both in geology.

Michael Van Dyke

Dr. Van Dyke is the Section Chief for Environmental Epidemiology and Occupational Health at the Colorado Department of Public Health and Environment (CDPHE). His educational background includes

a BS degree in Chemistry and Biology from the University of Southern Colorado and a M.S. and Ph.D. in Environmental Health from Colorado State University. Dr. Van Dyke has been involved with the Health, Safety, and Environmental profession for nearly 20 years. He previously worked in public health at TriCounty Health Department, occupational health for the Colorado OSHA Consultation Program, and academic research at National Jewish Health. Dr. Van Dyke's work and research has focused on occupational and environmental exposure assessment and health surveillance. He is currently the Principal Investigator for Colorado's NIOSH-funded occupational health surveillance program and Colorado's CDC-funded environmental public health tracking network. Dr. Van Dyke also manages the newly created Marijuana Health Effects unit at CDPHE that has been charged with developing surveillance methods for potential adverse effects of marijuana use.

Donna J. Vorhees

Dr. Vorhees directs the Energy Research Program at HEI. She is leading an effort to implement a Strategic Scientific Research Agenda designed to understand potential human exposures and health effects from unconventional oil and gas development and how they might be prevented or minimized. Vorhees has 25 years of consulting experience, assessing multi-pathway chemical exposures in indoor and outdoor environments, quantifying human health risks, and communicating risks to affected communities in the United States on behalf of government and private clients and internationally on behalf of the United Nations Environment Program. She serves on the U.S. EPA Board of Scientific Counselors Subcommittee on Chemical Safety for Sustainability and previously served on National Research Council committees (Health Risks of Phthalates and Sediment Dredging at Superfund Megalakes), other advisory committees, and peer review panels for numerous health risk assessments prepared by the U.S. EPA, the Consumer Product Safety Commission, and Health Canada. She is Adjunct Assistant Professor at the Boston University School of Public Health where she teaches Risk Assessment Methods. Vorhees received her ScM and ScD in Environmental Health from the Harvard School of Public Health.