The National Academies of
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BOARD ON AGRICULTURE AND NATURAL RESOURCES

Addressing Excess Reactive Nitrogen in Agriculture

Monday, June 28, 2021 (via Zoom)
1:00 – 3:00 PM ET
AGENDA

1:00 pm	**WELCOME** **Chuck W. Rice** (Moderator) BANR Chairman, Distinguished Professor of Agronomy, Mary L. Vanier University Professorship, Kansas State University - *Introduction and Background*
1:05 pm	**PRESENTATIONS** (20 min each): **James N. Galloway,** Sidman P. Poole Professor of Environmental Sciences at the University of Virginia. - *The big picture of the nitrogen management issue : An overview* **Jerry L. Hatfield,** retired Laboratory Director of the USDA-ARS National Laboratory for Agriculture and the Environment in Ames, Iowa. - *Complexities in managing nitrogen in agriculture: The soil-water linkage* **David Kanter**, Associate Professor of Environmental Studies at New York University and Vice-Chair of the International Nitrogen Initiative. - *What the social sciences can tell us about promising research and policy directions to better manage agricultural nitrogen*
2:05 pm	**PERSPECTIVES:** (8 min each): **Bonnie Keeler,** Associate Professor at the Humphrey School of Public Affairs, Co-director, Center for Science, Technology, and Environmental Policy. **Rebecca Boehm,** Economist, Food and Environment, Union of Concerned Scientists **Alan Blaylock,** Senior Agronomist for *Nutrien* **Alison Eagle**, Scientist, Sustainable Agricultural Program, Environmental Defense Fund (EDF).
2:45 pm	**DISCUSSION WITH MEMBERS OF THE BOARD ON AGRICULTURE AND NATURAL RESOURCES** --- What should be the focus of a NASEM/BANR Symposium in December of 2021?
3:00 pm	**ADJOURN**

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Presenter and Panelist Biosketches

(in speaking order)

MODERATOR

Charles W. Rice is a University Distinguished Professor of soil microbiology in the department of agronomy at Kansas State University. He conducts long-term research on soil organic dynamics, nitrogen transformations and microbial ecology. Recently, his research has focused on soil and global climate change including carbon and nitrogen emissions in agricultural and grassland ecosystems and soil carbon sequestration and its potential benefits to the ecosystem. Rice has also served in numerous capacities with the Soil Science Society of America. He currently is the Chairman of the National Academies Board on Agriculture and Natural Resources. Internationally, he served on the UN Intergovernmental Panel on Climate Change (IPCC) to author the Fourth Assessment Report, Climate Change 2007, and was among the scientists recognized when that work won a Nobel Peace Prize in 2007. Rice also sits on the advisory panel of several corporate sustainability teams across the industry, and is an active teaching professor. He has advised more than 47 graduate students, and 18 post-doctoral students and visiting scientists. In 2020, he was named Educator of the Year by the Mid America Crop Life Association. Rice holds a BS degree from Northern Illinois University and a PhD from the University of Kentucky. He joined the Kansas State faculty in 1988, becoming associate professor in 1993 and professor in 1998.

PRESENTERS

James N. Galloway is Sidman P. Poole Professor of Environmental Sciences at the University of Virginia. Dr. Galloway is a biogeochemist known for his work on the magnitude and consequences of the human alteration of biogeochemical cycles. His research includes investigations on the natural and anthropogenic controls on chemical cycles at the watershed, regional and global scales. He started first with trace metal biogeochemistry of the coastal ocean, and then expanded to investigations on the increased acidification of the atmosphere, soils and fresh waters. Most recently, he has focused on the nitrogen cycle. He was elected a Fellow of the American Association for the Advancement of Science in 2002 and a Fellow of the American Geophysical Union in 2008. That same year he, together with Harold Mooney, Stanford University, received the Tyler Prize for Environmental Achievement. In 2020 he was elected to the US National Academy of Sciences. He graduated from Whittier College with a BA in Biology and Chemistry, and from UCSD in 1972 with a PhD in Chemistry for his research on the fate of trace metals in a coastal ocean.

Jerry L. Hatfield is a retired Laboratory Director of the USDA-ARS National Laboratory for Agriculture and the Environment in Ames, Iowa. His research interests focus on the impact of agricultural systems on environmental quality and on how improved management can enhance production efficiency and create resilience to weather/climate extremes. He is the recipient of numerous awards including the

Hugh Hammond Bennett award, and election to the ARS Hall of Fame. His PhD degree is from Iowa State University in 1975 in the area of Agricultural Climatology with a statistics minor.

David Kanter is an Associate Professor of Environmental Studies at New York University and Vice-Chair of the International Nitrogen Initiative. His research examines new policy options for addressing nitrogen pollution and on how to manage the transition to a global food system consistent with the Sustainable Development Goals. Prior to his current position, David was a Postdoctoral Research Fellow at The Earth Institute at Columbia University. He received his BSc in Chemistry and Law from the University of Bristol in the UK and his MA and PhD in Science, Technology and Environmental Policy from Princeton University.

Bonnie Keeler is an associate professor at the Humphrey School of Public Affairs, where she co-directs the Center for Science, Technology, and Environmental Policy. Keeler works at the intersection of sustainability science and environmental economics, with particular expertise in water management and policy. Keeler leads the Beyond the Academy network - a coalition of university leaders seeking to reform academic models to promote actionable, engaged scholarship on sustainability. Keeler is also the co-director of the CREATE Initiative, a graduate fellowship program and community-engaged research effort at the intersection of environment and equity. She is a co-PI on the Minneapolis-St. Paul Long-term Ecological Research site. Keeler holds a PhD in Natural Resources (University of Minnesota, 2013), MS in Ecology, Evolution, and Behavior (University of Minnesota, 2007), and BA in Biology (Colorado College, 2001)

Rebecca Boehm is an Economist in the Food and Agricultural Program of the Union of Concerned Scientists. Rebecca Boehm is an economist with the Food & Environment program at the Union of Concerned Scientists. In her role, she conducts applied economic research to advance the development of a healthier, more sustainable, and equitable food system. Her research has focused on understanding the implications of food choices for climate mitigation and adaptation, evaluating federal nutrition programs including the Food Insecurity Nutrition Incentive program, and assessing public health interventions to encourage healthy eating among children. Her research has been published in various journals including *Climate*, *Food Policy*, *Journal of Nutrition Education Behavior*, and *Public Health Nutrition*. Prior to joining UCS, Dr. Boehm was a postdoctoral fellow at the Rudd Center for Food Policy and Obesity at the University of Connecticut, with a joint appointment in the UConn Agricultural and Resources Economics Department's Zwick Center for Food and Resource Policy. Dr. Boehm has a BA in ecology and evolutionary biology from Princeton University, and a MS and PhD from the Tufts University Friedman School of Nutrition Science and the Agriculture, Food, and Environment program.

Alan Blaylock is Senior Agronomist for Nutrien, a leading fertilizer company with operations in 13 countries. He applies science-based nutrient management principles and products to address practical questions in the field. Dr. Blaylock earned B.S. and M.S. degrees in agronomy and horticulture from Brigham Young University and a Ph.D. in soil science from Iowa State University. Growing up on irrigated farm in eastern Oregon and teaching soil science at Iowa State University as well as providing extension services prepared him for his current role as an agronomist at Nutrien. These experiences have helped Dr. Blaylock develop the skills to translate complex scientific principles into practical solutions. Although early in his university studies he explored computer science as a profession, deep family roots in agriculture brought him back to the people and values of his heritage. His career satisfaction comes from helping others improve the performance of nutrients and cropping systems.

Alison Eagle is Scientist, Sustainable Agricultural Program, for the Environmental Defense Fund (EDF). Alison provides scientific expertise to the sustainable agriculture team's efforts to eliminate nutrient pollution from productive agriculture. Her research includes synthesis and meta-analysis of field experimental data in nutrient cycling, with a focus on nitrogen. She works closely with other scientists to understand how farm management practices can reduce nutrient losses and maintain productivity while also improving water, air, and soil quality. Prior to joining EDF, Alison worked as a research associate for the Nicholas Institute for Environmental Policy Solutions at Duke University. Alison received her PhD from Wageningen University in 2009 (Agricultural Economics and Rural Policy), for which her research focused on agricultural land use and externalities. She holds a MS degree (International Agricultural Development, Soil Science) from the University of California at Davis, and a BSc degree (Agricultural Sciences) from the University of Alberta.