

**Invitation for Public Comment on the List of Nominated Candidates for the
EPA Science Advisory Board Animal Feeding Operation Emission Review Panel**

October 21, 2011

The U.S. Environmental Protection Agency (EPA) Science Advisory Board (SAB) Staff Office announced in a *Federal Register* Notice (Volume 76, Number 70, Pages 54466 – 54467) published on September 1, 2011 that it was seeking public nominations of technical experts to serve on an expert panel under the auspices of the SAB to conduct a peer review of EPA's development of air emission estimating methodologies for animal feeding operations. The SAB Staff Office sought public nominations of nationally recognized experts with demonstrated expertise and experience in the following areas related to Animal Feeding Operation (AFO) air emission estimation methods: Air emissions from broiler, dairy, egg layer, and/or swine production animal feeding operations; air monitoring and detection methods; exposure assessment; environmental statistics; emission and statistical modeling; and uncertainty analysis. The Panel will provide advice on scientific issues associated with EPA's development of AFO air emission estimating methodologies, review scientific publications nominated by EPA managers and make recommendations to the Administrator for recognition and awards.

Below is the list of nominated candidates that is based solely on relevant expertise and willingness to serve on the Panel. We hereby invite comments on the attached List of Candidates that the SAB Staff Office should consider in the formation of this Augmented Committee. Please be advised that comments received are subject to release under the Freedom of Information Act. Comments should be submitted to the attention of Mr. Edward Hanlon, Designated Federal Officer, no later than November 15, 2011. E-mailing comments (hanlon.edward@epa.gov) is the preferred mode of receipt.

The SAB Staff Office Director will make the final decision about who will serve on the Panel based on all relevant information. This includes a review of the confidential disclosure form (EPA Form 3110-48) and information gathered by staff and public comments. For the EPA SAB Staff Office, a balanced Panel is characterized by inclusion of candidates who possess the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the general charge. Specific criteria to be used in evaluating a candidate include: a) scientific and/or technical expertise, knowledge, and experience; b) availability and willingness to serve; c) absence of financial conflicts of interest; d) absence of appearance of a lack of impartiality; e) skills working in committees, subcommittees, and advisory panels; and, for the panel as a whole, f) diversity of scientific expertise and viewpoints.

Allen, David T.

University of Texas – Austin

Dr. David T. 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 holds a B.S. in Chemical Engineering from Cornell University (1979), and an M.S. (1981) and Ph.D. (1983) in Chemical Engineering from California Institute of Technology. Dr. Allen is the author of eight books and over 200 papers in areas ranging from coal liquefaction and heavy oil chemistry to the chemistry of urban atmospheres. For the past decade, his work has focused primarily on urban air quality and the development of materials for environmental education. Dr. Allen was a lead investigator for the first and second Texas Air Quality Studies, which involved hundreds of researchers drawn from around the world, and which have had a substantial impact on the direction of air quality policies in Texas. He has also developed environmental educational materials for engineering curricula and for the University's core curriculum. The quality of Dr. Allen's work has been recognized by the National Science Foundation (through the Presidential Young Investigator Award), the AT&T Foundation (through an Industrial Ecology Fellowship), the American Institute of Chemical Engineers (through the Cecil Award for contributions to environmental engineering and through the Research Excellence Award of the Sustainable Engineering Forum), the Association of Environmental Engineering and Science Professors (through their Distinguished Lecturer Award), and the State of Texas (through the Governor's Environmental Excellence Award). He has won teaching awards at the University of Texas and UCLA. Dr. Allen has held visiting faculty appointments at the California Institute of Technology, the University of California, Santa Barbara, and the Department of Energy.

Aneja, Viney

North Carolina State University

Viney Aneja is a Professor in the Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University (NCSU). He holds a B. Tech. degree in Chemical Engineering from the Indian Institute of Technology, Kanpur, India (1971); and an M.S. (1976) and Ph.D. (1977) in Chemical Engineering from North Carolina State University. His research has focused on agricultural air quality. Before joining the faculty of the Department of Marine, Earth, and Atmospheric Sciences at NCSU, Dr. Aneja conducted and supervised research at Corporate Research and Development, General Electric Company, New York, and Northrop Service, in Research Triangle Park in the areas of environmental engineering and separations technology. The U.S. Secretary of Agriculture appointed him as a member of the U.S. Agricultural Air Quality Task Force. Dr. Aneja was a member of the U.S. Environmental Protection Agency's (EPA) Science Advisory Board (SAB) Environmental Engineering Committee, and also is a member of EPA's SAB Integrated Nitrogen Committee. He is a Member Representative of the University Corporation for Atmospheric Research, Boulder, CO. Dr. Aneja won the Noryl Division Proprietary Innovation Award from General Electric in 1983, the Air Pollution Control Association Award for Distinguished Service in 1984, the General Electric Managerial Award in 1986, and at NCSU he received the 1991-92 Outstanding Extension Service Award. In 1998 the Air and Waste Management Association gave Dr. Aneja its Frank A. Chambers Award, the Association's highest scientific honor; in 1999 he became a Fellow of the Association; in 2001 he received the Association's Lyman A. Ripperton Award for distinguished achievement as an educator. He is the recipient of the 2007 North Carolina Award in Science, the highest award a civilian can receive from the Governor of North Carolina. In 2009 Dr. Aneja received the Senior National Research Council (NRC) Research Associateship. In 2010 he was invited by the U.S. White House Council on Environmental Quality to assist in the BP Gulf Spill. In 2010 Dr. Aneja received Distinguished Alumnus Award from the Indian Institute of Technology Kanpur, India. He served as a Director of the Air and Waste Management Association, and Chair of the Association's Education Council. Dr. Aneja has served on the editorial boards of the journals Environmental Pollution, Chemosphere, Journal of the Air and Waste Management Association, and Environmental Manager. He currently serves as Editorial Board Member of the international journal Atmospheric and Climate Science. Dr. Aneja is Associate Editor for the following journals: International Journal of Air Quality, Atmosphere, and Health; International Journal of Physical Review & Research International; International Journal of Applied Environmental Sciences; International Journal of Atmospheric Pollution Research; The Open Environmental & Biological Monitoring Journal; Journal of Marine Science: Research & Development; Journal of Environmental Research and Management; and the Scientific Journals International; and the Reader Advisory Panel of Nature.

Applegate, Todd J.

Purdue University

Dr. Todd J. Applegate is a Professor of Animal Sciences and Extension Poultry Specialist at Purdue University in the College of Agriculture, and also is a faculty in the inter-departmental Nutrition program. He holds a B.S. (1992) and M.S. (1995) in Animal Sciences-Animal Nutrition from Iowa State University and a Ph.D. in Animal Sciences-Nutritional Physiology from The Ohio State University (1999). Prior to coming to Purdue (2000), he held a post-doctoral research post at University of Maryland-College Park. Dr. Applegate's research utilizes nutritional approaches to reduce manure nutrient and air emissions from laying hens, broilers, turkeys, and commercial Peking ducks. In his extension role, he directly interfaces with poultry companies and contracted producers to implement nutrient management practices as well as technology adoption and adaptation. Nationally, Dr. Applegate has served as the poultry sub-committee chair for the latest revision of the American Society of Agricultural Engineers manure characteristics standard, former chair and project rewrite for the U.S. Department of Agriculture Southern regional project (S1032) entitled "Improving the sustainability of livestock and poultry production in the United States", and as a former director on the board of directors for the Poultry Science Association (an international scientific society). Additionally, Dr. Applegate has worked with other universities and the U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS), to develop the educational framework for NRCS to be able to offer financial incentives to livestock and poultry producers for planning and implementation of dietary strategies towards whole farm nutrient management.

Auermann, Brent

Texas A&M University

Dr. Brent Auermann is Professor of Biological and Agricultural Engineering (BAEN) and Extension Specialist with Texas A&M AgriLife. His position with Texas A&M AgriLife consists of a joint appointment, with 65% Extension and 35% research. He also holds an Adjunct Professor appointment at West Texas A&M University. Dr. Auermann holds a B.S. (1986) and M.S. (1990) in Agricultural Engineering from Texas A&M University, and a Ph.D. in Chemical and Bioresource Engineering from Colorado State University (1996). His research program centers on environmental aspects of concentrated livestock production, with 15 years of work in air pollution. Dr. Auermann has obtained competitive and special grants in air-quality topics totaling multi-million dollars over the past ten years. His primary research focus has been particulate matter but has also collaborated in research on ammonia, hydrogen sulfide, dispersion modeling, and wet and dry deposition. Dr. Auermann supervises and chairs graduate thesis/dissertation committees for M.S. and Ph.D. candidates at both Texas A&M University and West Texas A&M University. His office is located in Amarillo, TX, near the heart of the United States' cattle-feeding industry. Since 2007, Dr. Auermann has operated the "Canonceta" deposition-monitoring sites for the National Atmospheric Deposition Program (NADP site ID: TX43) and the Clean Air Status and Trends Network (CASTNET site ID: PAL190). He has also worked closely with the concentrated dairy industry in Texas, New Mexico, and Arizona with respect to emissions measurement and mitigation techniques.

Benson, Verel W.

Benson Consulting

Dr. Verel Benson is currently serving as a private consultant on Agricultural Management issues throughout the U.S. He holds a B.S. in Agricultural Economics from South Dakota State University (1965) and an M.S. and Ph.D. in Agricultural Economics from the University of Maryland (1969). Dr. Benson was a member of the team that developed a national database of the energy use in all phases of agriculture and helped compile a compendium of energy studies published in 1974. He was member of a national team that developed a plan for addressing irrigation efficiency from 1978 to 1980 and a contributing author on the final report. Dr. Benson was also the team leader of the evaluation of the PL-566 Small Watershed Program, a multi-million annual program administered by U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service, and prepared the final report that was published in 1986. He is a member of the team of scientists who built and continue to enhance the EPIC, APEX, ALMANAC, SWRRB and SWAT models and the attached databases. Dr. Benson conducted nearly 100 workshops on the EPIC, SWRRB, SWAT or APEX models in the U.S., Canada, France and Austria with nearly 1000 total participants. Over 4000 budgets and environmental model databases were built for national, regional, state and watershed analyses using these models; and these databases have been used in a number of studies by USDA agencies and other organizations. He received the Lifetime Achievement Award from the Worldwide Soil and Water Assessment Tool (SWAT) User Community in 2009. Dr. Benson recently completed a grant with the U.S. Environmental Protection Agency (EPA) Region 7 that addressed Targeting Best Management Practices in Critical Areas of High Priority Watersheds. Dr. Benson is currently working on a University of North Carolina grant "Development of a Tool for Preparation of Gridded Agricultural Management Data for Meteorological and Air Quality Modeling" (U.S. EPA Contract No. EP-W-095-023, "Operation of the Center for Community Air Quality Modeling and Analysis (CMAS)"; and he also serves as a consultant for the University of Tennessee on examining Environmental Impacts of Bio-energy Production.

Bloomfield, Peter

North Carolina State University

Dr. Peter Bloomfield is a Professor of Statistics at North Carolina State University (NCSU). He holds a B.Sc. in Mathematics (1967) and a Ph.D. in Statistics (1970) from the University of London. Dr. Bloomfield has held faculty positions at Imperial College and Princeton University before joining NCSU in 1983. He specializes in statistical methods for analyzing time series data, and has particular interests in geophysical and financial data and nonlinear statistical models for univariate and multivariate responses. Dr. Bloomfield has authored and coauthored numerous scientific publications including book chapters, journal articles, and non-refereed publications. Since 1992, he has been a Senior Fellow, National Institute of Statistical Sciences, Research Triangle Park, North Carolina. He is a Fellow of the Royal Statistical Society since 1969, and a Member and Fellow of the American Statistical Association as well as the Institute of Mathematical Statistics. He has served as Associate Editor of *Technometrics*, *Journal of the American Statistical Association*, and the *SIAM Journal of Scientific and Statistical Computing*, and has served on the Institute of Mathematical Statistics Committee on Special Papers, various subcommittees of the American Statistical Association. Committee on Nuclear Regulatory Research, National Research Council, the National Academy of Science Committee on National Statistics, and several National Aeronautics and Space Administration panels. Dr. Bloomfield also contributed to reports of the Intergovernmental Panel on Climate Change (IPCC). He is the author of a book on the frequency-domain analysis of time series, now in its second edition, and co-author of a book on statistical methods based on least absolute deviations. Dr. Bloomfield has twice taken extended leaves to work on financial models at a major financial institution.

Brisolara, Kari Fitzmorris

Louisiana State University

Dr. Kari Fitzmorris Brisolara is an Associate Professor of Environmental and Occupational Health Sciences at the Louisiana State University Health Sciences Center, School of Public Health in New Orleans, Louisiana. She holds a B.S. in Biology from Louisiana College (1997), and an M.S. P.H. (2001) and Doctor of Science (2004) in Environmental Health Sciences from Tulane University, School of Public Health and Tropical Medicine. From there, she accepted a post-doctoral appointment with the United States Department of Agriculture – Agriculture Research Service where she spent two years focused on the development of activated carbon from agricultural residuals. For the past five years, she has been an Assistant Professor of Environmental Health with the Jiann-Ping Hsu College of Public Health at Georgia Southern University. Dr. Brisolara’s research centers on the development of innovative reuse options for agricultural and municipal waste. Her specific areas of research interest include the development of activated carbon from poultry waste for the remediation of agricultural emissions and the use of indicator organisms in the evaluation of process efficacy. Dr. Brisolara has also served on the board of the Georgia Environmental Health Association and is an active member of the Water Environment Federation (WEF) where she was appointed Chair of the Agriculture and Industrial Residuals Subcommittee in 2006. In this role, she participated in the development of congressional position statements on the 2008 Farm Bill and the U.S. Environmental Protection Agency (EPA) Concentrated Animal Feeding Operation Rule in Washington, D.C. In 2009, Dr. Brisolara was also elected to the WEF House of Delegates, which is the deliberative and representational body of the Federation. She has also consulted with several private companies regarding approval of waste treatment processes with EPA’s Pathogen Equivalency Committee.

Burns, Robert

University of Tennessee

Dr. Robert T. Burns currently serves as the Assistant Dean for Agriculture, Natural Resources & Resource Development and Professor of Biosystems Engineering with the University of Tennessee. He holds a B.S. in Agricultural Engineering (1990), M.S. in Environmental Engineering (1992), and Ph.D. in Civil Engineering (1995) from The University of Tennessee. Dr. Burns is a registered professional engineer, and has 20 years of experience in environmental and agricultural engineering that includes extensive international work experience in both developed and developing countries including, Armenia, Bulgaria, Croatia, Denmark, England, Germany, Netherlands, Romania, Republic of Korea, Serbia and Zambia. As Assistant Dean, Dr. Burns oversees the Extension programs of seven academic departments and two Centers within the University of Tennessee Institute of Agriculture. He also serves as the state Agricultural and Natural Resources (ANR) Extension Program Leader and is responsible for the ANR Extension programs offered through 95 county Extension offices across Tennessee. Prior to being named as Assistant Dean, Dr. Burns served as a Professor of Agricultural and Biosystems Engineering at Iowa State University, and as Director of the Iowa State University Agricultural Waste Management Team. Under his leadership, this team conducted applied research and extension programming focused on animal manure and agricultural waste management that included work on air emissions monitoring and mitigation, manure and nutrient management and anaerobic digestion. Dr. Burns has given over 500 professional presentations and published over 200 technical publications dealing with manure and air quality management. Prior to working at Iowa State University, Dr. Burns served as a faculty member in the Agricultural Engineering Department at the University of Tennessee for nine years, working on environmental management issues associated with animal production systems.

Burr, Jamie

Tyson Foods, Inc.

Mr. Jamie Burr is Senior Environmental Manager and he is responsible for the environmental management of live production operations for Tyson Foods, Inc. He holds a B.S. (1997) and M.S. (1999) in Natural and Applied Science from Missouri State University (formerly Southwest Missouri State University). After earning his M.S., Mr. Burr started his environmental management career with the Pork Group, Inc., a wholly owned subsidiary of Tyson Foods, Inc. He was Tyson Foods' lead in the broiler air emissions study conducted in Kentucky by Iowa State and University of Kentucky. Mr. Burr has been the U.S. Environmental Protection Agency (EPA) contact throughout the study and during data analysis. He has an extensive background with all facets of swine and poultry production. Mr. Burr's career has provided the opportunity to become well versed in the production of animals and managing the environmental aspects of such. He has a working knowledge of barn design, ventilation, manure management, and compliance management. Moreover, Mr. Burr has served on several committees and work groups charged with reviewing and developing regulations for animal agriculture.

Carriquiry, Alicia

Iowa State University

Dr. Alicia Carriquiry is Distinguished Professor of Statistics and Director of Graduate Education at Iowa State University. She holds an Ing. Agr. from Universidad de la República, Uruguay (1981), an M.S. in Animal Science from the University of Illinois (1985), and an M.S. in Statistics (1986) and Ph.D. in Statistics and Animal Genetics (1989) from Iowa State University. Dr. Carriquiry is an elected member of the International Statistical Institute, a Fellow of the American Statistical Association and a Fellow of the Institute of Mathematical Statistics. She was Vice President of the American Statistical Association and a member of the Council of the International Statistical Institute until recently. Dr. Carriquiry served on the Executive Committee of the Institute of Mathematical Statistics between 1999 and 2005 and was a member of the Board of Trustees of the National Institute of Statistical Sciences between 1997 and 2007. She is also a past president of the International Society for Bayesian Analysis (ISBA). Dr. Carriquiry is Associate Editor of *The Annals of Applied Statistics* and Editor of *StatProb*, and electronic encyclopedia of statistics and probability. She has served on several National Academy of Sciences committees and has been invited as a confidential reviewer for many others. Currently, Dr. Carriquiry is a member of the standing Committee on National Statistics of the National Research Council, of the standing Committee on Use of Evidence in Public Policy, of the ad-hoc Committee to Address Representation of Minority Women in STEM Fields, and chairs the NRC Committee to Forecast the Number of Illegal Border Crossings into the United States. She was a member of the Federal Steering Committee Future Directions for the CSFII/NHANES Diet/Nutrition Survey: What We Eat in America and also a member of the NIH Kidney, Nutrition, Obesity and Diabetes Study Section. Dr. Carriquiry recently completed her term in the Human Subjects Review Board (HSRB), a national committee that advises the U.S. Environmental Protection Agency (EPA) on the scientific and ethical validity of studies involving intentional dosing of human subjects.

Cortus, Erin L

South Dakota State University

Dr. Erin Cortus is an Assistant Professor at South Dakota State University in the Agricultural and Biosystems Engineering Department, and has held this position with extension, research and teaching responsibilities since June 2009. She holds a B.E. (2002) and Ph.D. (2007) in Agricultural and Bioresource Engineering from the University of Saskatchewan, Canada. Dr. Cortus's present extension, research and teaching activities focus on indoor environmental quality and emissions from livestock production systems, manure management and other livestock manure-related topics. Between 2002 and 2006, she was a graduate research assistant in the Department of Agricultural and Bioresource Engineering at the University of Saskatchewan, and at the Prairie Swine Centre Inc., both in Saskatoon, SK, Canada. Dr. Cortus's research work focused on modeling ammonia production in swine barns using a mechanistic or process-based approach, and mitigation methods to reduce gas and odor production from swine facilities. Between 2006 and 2009, she was a Post-Doctoral Research Assistant/Associate at Purdue University, working on the National Air Emissions Monitoring Study, a multi-institutional study quantifying the gas and particulate matter emissions from chicken, dairy and swine farms across the United States. Dr. Cortus was the Data Analysis Manager for this Study.

Coufal, Craig D.

Texas A&M University

Dr. Craig D. Coufal is an Assistant Professor and Extension Specialist in the Department of Poultry Science at Texas A&M University. He holds a B.S. (1997), M.S. (2000) and Ph.D. (2005) in Poultry Science from Texas A&M University. Dr. Coufal's Ph.D. dissertation title is: Quantification of litter production and the fate of nitrogen in commercial broiler production systems. His research focused on quantifying litter production and nitrogen emissions from broilers over 18 consecutive flocks using recycled litter. Top-dressing of litter as a management strategy was also investigated. In his current position, Dr. Coufal's extension and applied research program focuses on poultry litter and waste management and development of strategies and management practices to minimize the potential for environmental impact from poultry production systems. He also teaches an upper-level undergraduate course entitled "Animal Waste Management" in the Department of Poultry Science. Dr. Coufal is an active member of the Poultry Science Association, an Associate Editor for Poultry Science, and a reviewer for the Journal of Applied Poultry Research. He is also a member of the executive committee of the National Poultry Waste Management Symposium. After completing his B.S. in 1997, Dr. Coufal worked for one year in the egg industry. Following completion of his M.S., Dr. Coufal worked for the Department of Poultry Science as an Extension Associate from 2001 to 2003. He joined the faculty of the Mississippi State University Poultry Science Department in 2006 as an Assistant Extension Professor. Dr. Coufal served as the only full-time extension specialist there until accepting his current position at Texas A&M in 2008.

Cullen, Alison C.

University of Washington

Dr. Alison Cullen is Professor of Public Affairs at University of Washington. She holds a B.S. in Civil/Environmental Engineering from the Massachusetts Institute of Technology (1984), and an M.S. in Environmental Health Science, Exposure Assessment, and Engineering (1989) and an Sc.D. in Environmental Health Management (1992) from Harvard University School of Public Health. Dr. Cullen joined the Evans School faculty at University of Washington in 1995, and has served as Associate Dean of Academic Affairs. Her research involves the analysis of environmental risks, decision making in the face of risks which are uncertain or vary across populations, and the application of value of information and distributional techniques. Dr. Cullen's areas of specialization include Environmental Risk Analysis, Environmental Science and Policy, Quantitative Uncertainty Analysis, and Statistical Decision Theory. She was a 2007-08 visiting professor at the Swiss Federal Institute of Technology (ETH) in Zürich, Switzerland, and is active in environmental exposure assessment projects in the U.S. and internationally. Dr. Cullen serves on the board of the University of Washington's Environmental Management Program. She is also the past president of the Society for Risk Analysis. Dr. Cullen previously served on the faculty of the Harvard University School of Public Health. She is the 2003 recipient of the U.S. Environmental Protection Agency's Special Recognition in the Field of Air Toxics, the 2002 Chauncey Starr Award from the Society for Risk Analysis, and the 1998 Outstanding Young Scientist Award from the International Society of Exposure Assessment. Outside of academia, Dr. Cullen has held positions in the Water Quality Branch of the U.S. Environmental Protection Agency and served as a technical consultant to many groups, including the U.S. Consumer Product Safety Commission, the State of Washington's Department of Ecology, the City of Seattle's Office of Sustainability, and the Ministry of Public Health in the Slovak Republic. She also served on the U.S. National Academy of Sciences Committee on the Coeur d'Alene Superfund site since from 2003-05, and is an affiliate scientist on the National Center for Atmospheric Research's Uncertainty Initiative from 2000-04.

Embertson, Nichole M.

Whatcom Conservation District

Dr. Nichole M. Embertson is a Nutrient Management and Air Quality Specialist with the Whatcom Conservation District, Lyndon, WA, and provides technical assistance on nutrient and air quality issues to agencies and industry professionals across Washington State. She holds a B.S. in Animal Science from California Polytechnic State University, San Luis Obispo (2002), and an M.S. from University of California at Davis (2004) and Ph.D. from Colorado State University (2007) in Environmental Management of Livestock with a specialty in Air Quality. Dr. Embertson has spent the last ten years conducting research and working with livestock producers on a variety of topics including nutrient and waste management issues, air and water quality improvement projects, emissions quantifications studies, development and identification of effective best management practices (BMP) to reduce air emissions from livestock operations (i.e., dairy, Concentrated Animal Feeding Operations), and air quality policy and planning. Additionally, she has a unique ability to appeal to producers, regulatory agency personnel, and research professionals on the same level and build bridges of understanding and communication across various sectors of the agricultural industry. Dr. Embertson's knowledge of dairy and livestock operations as well as climate, air, water, and nutrient chemistry provides a unique balance and approach to addressing environmental issues is a systems approach.

Faulkner, William Brock

Texas A&M University

Dr. William Brock Faulkner is a Research Assistant Professor in the Department of Biological and Agricultural Engineering and a member of the Center for Agricultural Air Quality Engineering and Science at Texas A&M University. He holds a B.S. in Agricultural Engineering (2004), and an M.S. (2006) and Ph.D. (2008) in Biological and Agricultural Engineering from Texas A&M University. Dr. Faulkner's research activities in air quality have included a broad range of topics relevant to animal agriculture. He has worked to characterize emissions of particulate matter (PM) from multiple agricultural facilities, including feedyards, dairies, broiler barns, and cotton and almond harvesting operations. Dr. Faulkner has extensive understanding of PM sampling issues and has been asked to contribute to multiple white papers produced by the U.S. Department of Agriculture (USDA) Agricultural Air Quality Task Force (on which he now serves), brief these Task Force on issues related to PM, and represent the USDA along with Task Force members at a meeting of scientists from the USDA and the U.S. Environmental Protection Agency (EPA) in February 2010. Furthermore, he has been asked by the Air Quality Education for Animal Agriculture program to teach continuing professional development courses on PM measurement. Dr. Faulkner has also evaluated abatement strategies for PM emissions from agricultural processing facilities and almond harvest operations. His research endeavors extend to gaseous pollutants emitted from agricultural facilities as well. Dr. Faulkner has experience measuring volatile organic compounds, ammonia, and greenhouse gas emissions from livestock production facilities using a variety of instrumentation, including gas chromatography, open path Fourier Transform Infrared Spectroscopy, and tunable diode lasers. Dr. Faulkner has a broad understanding of gaseous measurement techniques and the processes that affect gaseous pollutant generation that would assist him in assessing methodologies to calculate emission factors from data generated through the National Air Emissions Monitoring Study. Dr. Faulkner has a national reputation as a leader in agricultural air quality. He has a broad understanding of numerous issues related to agricultural air quality coupled with an ability to communicate technical information clearly and concisely. Furthermore, Dr. Faulkner has owned and operated a beef cattle ranch and hay production operation in Central Texas since 1997. He has been involved in activities of national and local producer organizations, including the North American Limousin Foundation, Brazos Area Hay Producers Association, and the Brazos County Beef and Forage Committee which enhances his understanding of the day-to-day operations of livestock production.

Gates, Richard S.

University of Illinois, Urbana-Champaign

Dr. Richard S. Gates is a Professor at the University of Illinois, Department of Agricultural and Biological Engineering where he has worked since August 2008. He holds a B.S. in Agricultural Engineering from the University of Minnesota (1978), and an M.S. in Agricultural Engineering (1980) and Ph.D. in Biological Engineering (1984) from Cornell University. Prior to joining University of Illinois, Dr. Gates spent 23 years at the University of Kentucky, as Assistant, Associate and full Professor, as well as Chair of the Department of Biosystems and Agricultural Engineering. His recent research and extension work involve agricultural air quality baseline measurement and assessment of mitigation techniques, and bioinstrumentation for measuring animal welfare including preference-based testing. Dr. Gates has been lead investigator on a U.S. Department of Agriculture (USDA) project that was funded in 2001 to quantify ammonia emissions from U.S. broiler and layer operations, and a co-Principle Investigator on the first completed U.S. Air Consent Agreement work for measuring gaseous and particulate emissions from U.S. broiler housing. He is author or coauthor of 107 refereed journal articles and more than 257 other publications and presentations. Dr. Gates has taught instrumentation, environment control, structures and environment design, data acquisition and control, probability and statistics, surveying and nonlinear optimization. His extension activities have been focused on greenhouse environment control, livestock and poultry facilities, energy efficiency and agricultural air quality. Dr. Gates' international experiences include leading a U.S.-Brazil student exchange consortium with Purdue University, University of São Paulo – Pirassununga, and the Federal University of Viçosa, co-Principle Investigator of a U.S.-European student exchange consortium with Virginia Tech, University College Dublin, Madrid Polytechnic University, Agriculture University of Athens, and the University of Bari; leading a 26-student study group to France (Dijon), overseas sabbaticals in South Africa (University of Natal), Greece (Agricultural University of Athens) and Japan (Kitasato University), and engineering work for 6 months at Technion University, Haifa Israel. Dr. Gates is past leader of a U.S.-Brazil Consortium for undergraduate student exchange between University of Kentucky, Iowa State University, Federal Universities of Viçosa, Campina Grande, Lavras and University of São Paulo – Piracicaba. He is one of two Americans on the board for Section II of the CIGR (International Agricultural Engineering Commission). Dr. Gates is co-founder of the Kentucky Rural Energy Consortium, served on the Board of Directors of the American Society for Agricultural and Biological Engineering, chair of the Research Subcommittee of the United Egg Producer's Environmental Scientific panel, and is recent recipient of the ASABE Henry L. Giese Structures and Environment Award. He is a registered professional engineer (Kentucky).

Gill, Sheraz

San Joaquin Valley Air Pollution Control District

Mr. Sheraz Gill is a Supervising Air Quality Engineer at the San Joaquin Valley Air Pollution Control District (SJVAPCD). He holds a B.S. in Mechanical Engineering from California State University Fresno (2000). Mr. Gill has over 10 years of air quality experience dealing with a wide array of air pollution sources. With the passage of California Senate Bill 700 in late 2003, which brought the agricultural sector under air quality regulation in California, Mr. Gill has become the key person responsible for implementing the Air District's agricultural air quality programs in the nation's most productive agricultural area. These programs include the permitting and regulation of existing, new, and expanding dairies and other CAFs and agricultural operations. The Air District has been at the national forefront of developing rules and policies for the regulation of air emissions from agriculture, which have been used by many other air agencies to guide their actions. For the past 7 years, Mr. Gill has helped design and develop, with the help of stakeholders, more than ten on-farm studies to improve the scientific knowledge and understanding of air pollution emissions from confined animal facilities (CAFs). In addition to these studies, approximately two dozen other studies have been evaluated and vetted. The SJVAPCD, under Mr. Gill's leadership, used the data from these studies to develop a comprehensive set of emissions factors for dairies in 2005 - the first comprehensive emissions factor ever developed. Additional district-managed on-dairy emissions testing resulted in a significant revision to that factor in 2010/2011. Emission factors have also been developed for other CAFs. Mr. Gill has worked extensively with industry representatives such as Paul Martin, Director of Environmental Services with Western United Dairyman Association, Kevin Abernathy, Executive Director of the California Dairy Campaign, J.P. Catviela, Program Coordinator with Dairy Cares and regulatory personnel such as Kerry Drake and Sona Chilingaryan with the U.S. Environmental Protection Agency (EPA) on an array of subjects including rule development issues. Mr. Gill has also served on multiple committees including: the Dairy Permitting Advisory Group (DPAG), which included dairy stakeholders, scientists, environmentalists, and regulators, tasked with proposing controls and emission factors; chair and vice-chair of the technical committees of the Dairy Subcommittee and AGTECH groups which are part of the San Joaquin Valley Air Pollution Study Agency, consisting of regulators, industry representatives, and scientists, tasked with guiding and vetting all agricultural related research and regulatory projects; multiple agricultural discussion panels discussing agricultural research and guiding proposed and future emissions studies. Mr. Gill has also shared his expertise on agricultural emissions to dozens of audiences, including universities, regulatory agencies, and stakeholder groups.

Hagevoort, G. Robert

New Mexico State University

Dr. Robert Hagevoort, a native of The Netherlands, is Assistant Professor and Extension Dairy Specialist in the Extension Animal Sciences and Natural Resources Department of College of Agricultural in the College of Consumer and Environmental Sciences at New Mexico State University (NMSU). He holds a B.S. in Tropical Animal Production from the Deventer College for Tropical Agriculture in The Netherlands (1987), and an M.S. in Range Nutrition (1989) and Ph.D. in Animal Nutrition (1993) from Texas A&M University. As an Extension Specialist, he has been working closely with the Dairy Industry in New Mexico on environmental and regulatory issues, and initiated an effort to rebuild a dairy program at NMSU through the formation of the Southern Great Plains Dairy Consortium which he currently chairs. Prior to joining NMSU as an Extension Dairy Specialist in November 2005, Dr. Hagevoort served for over 10 years as an independent dairy management consultant primarily in California's southern and central Valley. In March of 2011, Dr. Hagevoort received NMSU's first Endowed Dairy Chair, a position charged with promoting the visibility of the dairy industry through research, extension and education efforts and which serves a policy center for regulatory matters.

Harper, Lowery

Lowry A. Harper Consulting Company

Dr. Lowry A. Harper is President of Harper Consulting Co. which specializes in trace-gas emissions evaluation. He recently retired from the U.S. Department of Agriculture (Agriculture Research Service) and the University of Georgia (Poultry Science Department) where he developed methodologies and performed studies in the transport of trace-gases in agricultural production. Dr. Harper holds a B.S. in Agricultural Engineering (1964) and M.S. in Soil Physics (1966) from the University of Florida, and a Ph.D. in Agricultural Physics from the University of Georgia (1971). Dr. Harper and colleagues have performed creative extension of existing micrometeorological and atmospheric transport theory and methodology in order to explain trace-gas transport in agricultural cropping and animal production systems. His work has extensively utilized systems-analysis in explaining transport mechanisms and cycling dynamics in the soil-plant-animal-atmosphere system including studies in the swine, poultry, dairy, beef, and energy industries. Dr. Harper has evaluated emissions of natural and synthetic substances such as water vapor, nitrogen and carbon compounds, nitrogen gas, pesticides, herbicides, bioaerosols, and odors. Examples of these evaluations include works on carbon dioxide enrichment (effects of global climate change) and its effects on cropping systems; effects of ammonia loss and absorption by cropping systems; transport of ammonia between animal production systems and crops; emissions of global-change gases from animals (enteric methane emissions); emissions of air-quality (ammonia, odors, bioaerosols) and global-change (methane, nitrous oxide) gases from animal production systems; and global-change and air-quality gas emissions from energy production (methane-to-methanol). Dr. Harper and colleagues have developed new non-invasive techniques to obtain accurate estimates of trace gas emissions from animals under natural conditions, from confined animal feeding operations (including confinement facilities and waste-disposal systems), from cropping systems, and energy production systems. These techniques for trace-gas emissions determination were based on integrated horizontal flux and inverse dispersion analysis concepts and pioneering work was performed using these techniques along with innovative measurement techniques such as open- and closed-path laser spectroscopy. His work has attracted international interest and his work has provided input for the U.S. Department of Agriculture, U.S. Environmental Protection Agency, National Institute of Standards and Technology, Intergovernmental Panel on Climate Change, North American Carbon Program, U.S. Swine Monitoring Consensus Plan, State Environmental Protection Divisions, Agriculture and Agri-Food Canada, Australian Greenhouse Gas Initiative, Agricultural Air Research Council, and other national and international trace-gas organizations. Dr. Harper has authored and coauthored numerous scientific publications including book chapters, journal articles, and non-refereed publications. He continues to publish and make presentations at U.S. and international scientific conferences.

Hatfield, Jerry L.

U.S. Department of Agriculture-Agriculture Research Service

Dr. Jerry L. Hatfield is currently the Laboratory Director of the U.S. Department of Agriculture (USDA) – Agriculture Research Service (ARS) National Laboratory for Agriculture and the Environment in Ames, Iowa. He holds a B.S. in Agronomy from Kansas State University (1971), an M.S. from the University of Kentucky in Agronomy (1972), and a Ph.D. in Agricultural Climatology and Statistics from Iowa State University (1975). Dr. Hatfield served on the faculty of the University of California-Davis as a biometeorologist from 1975 through 1983 and then joined USDA-Agriculture Research Service in Lubbock, Texas as the Research Leader of the Plant Stress and Water Conservation Research Unit from 1983 through 1989. He was appointed Laboratory Director of the National Soil Tilth Laboratory in 1989 which was renamed to the National Laboratory for Agriculture and the Environment in 2009. Dr. Hatfield’s personal research focuses on quantifying the interactions among the components of the soil-plant-atmosphere system to quantify resilience of cropping systems to climate change. He served as the lead author on the Agriculture section of the Synthesis and Assessment Product 4.3 on “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity” and as a member of the IPCC process that received the 2007 Nobel Peace Prize, and contributing author on “Agriculture” for the State of the Knowledge Report on “Global Climate Change Impacts in the United States and Lead Author on an IPCC Special report on the Effects of Climate Extremes. Dr. Hatfield currently serves as the lead on the Agriculture sector report and the Midwest region report for the 2013 National Climate Assessment. He served on the USDA Agriculture Air Quality Task Force and conducts research on the emission and dispersion of gases and particulates from livestock facilities and agricultural systems. Dr. Hatfield is a Fellow of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America and Past-President of the American Society of Agronomy and member of the American Meteorological Society, American Geophysical Union and Soil and Water Conservation Society. He is the recipient of numerous awards including the USDA Superior Service Award in 1997, the Arthur S. Flemming award for Outstanding Service to the Federal Government in 1997 along with the Distinguished Service Award, Kansas State University in 2002, Distinguished Alumni Award from Kansas State University in 2011, and the 2011 Conservation Research Award from the Soil and Water Conservation Society. Dr. Hatfield is the author or co-author of 381 refereed publications and the editor of 15 monographs.

Hoff, Steven J.

Iowa State University

Dr. Steven Hoff is a Professor in the Department of Agricultural and Biosystems Engineering at Iowa State University. He holds a B.S. in Agricultural Engineering Technology from University of Wisconsin – River Falls (1981), and a B.Ag.Eng (1985), M.S. (1987) and Ph.D. (1990) in Agricultural Engineering from the University of Minnesota. Dr. Hoff’s areas of teaching and research include environmental climate control for animal housing, sensor development, controller development, and air emission measurement and control technologies for animal production systems. His teaching responsibilities include developing and refining courses related to livestock environment control, sensors and instrumentation. Dr. Hoff developed a graduate-level course on data acquisition, computer interfacing, instrumentation and sensors, and reworked graduate-level courses on environmental control and ventilation of animal structures, and on wood structures design. His research responsibilities include the development of an internationally recognized research program in the livestock environment area. Dr. Hoff’s areas of research focus involve the efficient distribution of fresh air, mathematical model development of air and contaminant gas dispersion, development of air-quality sensors, and the evaluation and reduction of emissions from livestock and poultry production systems. He is a Fellow of the American Society of Agricultural and Biological Engineers and is a registered Professional Engineer.

Jacobson, Larry

University of Minnesota

Dr. Larry Jacobson is Professor and Extension Engineer in the Bioproducts and Biosystems Engineering (BBE) Department of the University of Minnesota. He holds a BA in Agricultural Engineering (1972), and M.S. (1974) and Ph.D. (1983) in Agricultural Engineering from the University of Minnesota. Dr. Jacobson's appointment at the University of Minnesota is divided between extension (outreach) and research. The research topics that he has lead on includes: alternative housing systems for pigs, development of manure management practices for the Minnesota pork industry, evaluation of the indoor air quality concerns, energy conservation and lighting efficiencies in dairy and pig facilities, and evaluation of odor control technologies and the development of an odor ratings systems. Since 2001, Dr. Jacobson has been project leader for a six-state air emission monitoring project that measured gases, dust, and odor from commercial pig and poultry buildings and more recently is the Principle Investigator for one of the air emissions monitoring sites (dairy buildings) of the National Air Emissions Monitoring Study (NAEMS) which is gathering information over a 2 year period from 15 different animal production sites around the country. During the 1994-95 academic year, he was a visiting scientist at a research institute in Denmark working on projects involving air quality concerns inside and outside pig facilities. During that year Dr. Jacobson also participated in a four country (United Kingdom, Germany, Netherlands, and Denmark) European Community (EC) research project on monitoring indoor livestock building environments and carried out an indoor air quality (dust) experiment. He has leadership responsibility for the Minnesota's extension programs in animal housing systems, including farmstead layouts, structural design of buildings, ventilation and environmental control of animal facilities, and the management of manure from animal production operations. Dr. Jacobson has worked with the various animal species important to the state, including: pigs, dairy and beef cattle, and poultry (broilers, turkeys, & layers) on such important issues as indoor air quality, energy conservation, effective manure management systems, and odor and gas emissions. He has worked with other extension staff, state agency personnel, commodity groups, and private industry representatives to deliver educational programs to a variety of audiences both within and outside of Minnesota.

Jayanty, R.K.M.

RTI International

Dr. R.K.M. Jayanty is a Senior Fellow at RTI International, Research Triangle Park, North Carolina and an Adjunct Professor in the Department of Biological and Agricultural Engineering at North Carolina State University (NCSU). He holds a B.S. in Chemistry (1964) and M.S. in Analytical Chemistry (1966) from Andhra University, Waltair, India, a Ph.D. in Physical Chemistry from University of Bradford, Bradford, England (1972), and an M.S. in Engineering - Environmental Pollution Control from Pennsylvania State University (1975). Dr. Jayanty has over 40 years of experience in the field of atmospheric chemistry/environmental analytical chemistry, including significant program management and technical experience with complex, multimedia sampling and analysis and method development/evaluation programs related to air toxics and fine particles in the atmosphere. He provides scientific leadership and direction, advises senior management at RTI on strategic planning and in new areas of research and leading edge science and serves on internal scientific review and advisory committees. Since 1999, Dr. Jayanty has been the Program Manager for the chemical speciation of PM_{2.5} filter samples collected in the nationwide network operations (CSN, CASTNET, and IMPROVE). His innovations in measurement technology have been instrumental in advancing the scientific understanding of human exposure assessment and in developing pollution control policies to improve air quality and protect public health. Dr. Jayanty also has considerable experience in environmental exposure assessment, lead in paint, house dust and characterization of emissions from hazardous waste sites. He has recently collaborated with scientists at NCSU on the characterization of Particulate Matter from Egg Production Facilities: Sources versus Public Exposure. Dr. Jayanty has also served on many peer review panels for the U.S. Environmental Protection Agency (EPA), National Science Foundation, and U.S. Department of Energy extramural grant programs, has served on a panel reviewing EPA's Centers of Excellence and has advised National Aeronautics and Space Administration (NASA) on the selection of advanced indoor air monitoring systems to be used on the International Space Station for the determination of volatile organic compounds. He served as Governor's Scientific Advisory Board Member for the State of North Carolina Air Toxics and Odor Control Program. Dr. Jayanty has been an Editorial Review Board Member for the Journal of Air and Waste Management Association (AWMA) and peer reviewer for several other journals since 1990. He is internationally recognized for his contributions to the field of atmospheric chemistry/environmental science and has many prestigious awards from professional societies including the American Chemical Society Award for Creative Advances in Environmental Science and Technology, and the Frank Chambers Award for the Science and Art of Air Pollution Control from the AWMA. In 2010, Dr. Jayanty received the Lifetime Achievement Award in Environmental Practices from the Institute of Professional Environmental Practice.

Koerber, Michael

Lake Michigan Air Directors Consortium

Mr. Michael Koerber is the Executive Director for the Lake Michigan Air Directors Consortium (LADCO). He holds a B.S. in Environmental Engineering from University of Illinois-Chicago (1976) and an M.S. in Meteorology from Pennsylvania State University (1978). The LADCO was established in 1989 by the States of Illinois, Indiana, Michigan, and Wisconsin to address regional air quality problems in the Midwest. As Executive Director, Mr. Koerber's role is to provide day-to-day management for LADCO. Mr. Koerber joined LADCO in 1990. Prior to that, he worked for the U.S. Environmental Protection Agency (EPA) Region V office as regional meteorologist. Mr. Koerber has over 30 years experience in air quality management. His technical interests and accomplishments include application of mathematical computer models, analysis of air quality monitoring data, development of local and regional emissions inventories, and designing ambient monitoring programs – all with a focus on addressing real-world air pollution problems. He has served on several EPA and National Association of Clean Air Agency (NACAA) committees and workgroups, and is a member of the American Meteorological Society and the Air & Waste Management Association.

Kohn, Richard

University of Maryland, College Park

Dr. Richard Kohn is Professor of Animal and Avian Sciences at the University of Maryland, College Park. He holds a B.S. from Cornell University (1985), an M.S. from University of New Hampshire (1987), and Ph.D. from Michigan State University (1998), all in Animal Science. Dr. Kohn conducts research (75%) and engage in extension education (25%) focused on mathematical modeling to improve animal feeding and management (dairy and poultry) and reduce nutrient losses to the environment. His research also includes development of mathematical models of nitrogen flows on dairy farms, and development and application of software to track nutrient flows on farms. Dr. Kohn was a member of the National Academies of Sciences Committee on Air Emissions from Animal Feeding Operations and coauthored two reports from that committee. He is currently a member of the Environment Committee of the Federation of Animal Science Societies (FASS). The Environment Committee has six members representing the 5000 members of FASS. Dr. Kohn is a member of the American Society of Animal Science, and the American Dairy Science Association.

Lester, Julia C.

ENVIRON International Corporation

Dr. Julia Lester is a Principal of ENVIRON International Corporation, a privately-held international environmental consultancy, with over 21 years of air quality experience. She holds a B.S. in Chemical Engineering from Purdue University (1981) and an M.S. (1984) and Ph.D. (1988) in Chemical Engineering from the California Institute of Technology. Prior to joining ENVIRON in August 2004, Dr. Lester worked over 14 years at the South Coast Air Quality Management District (SCAQMD). At the SCAQMD she prepared State Implementation Plans (SIPs) for a variety of pollutants and conducted regional photochemical modeling for ozone and particulate matter (PM) attainment demonstrations. For ten years Dr. Lester led the SCAQMD's PM Strategies section in developing emission inventories, modeling demonstrations, PM State Implementation Plans, and best available control measure (BACM) rules for fugitive dust and ammonia sources, including the first-in-the-nation rules for crop farming (PM dust) and dairies (ammonia, PM, and volatile organic compounds). At ENVIRON, she has prepared BACM analyses and PM SIP documents for the Imperial County Air Pollution Control District and assisted dairy, poultry and crop farmers in assessing proposed emission factors, permitting requirements and rules, as well as in complying with existing rules. Dr. Lester is a certified permitting professional by both the SCAQMD and the San Joaquin Valley Air Pollution Control District. She is a member of the Air and Waste Management Associations AB-1 (Particulate Matter) Committee and chaired the 2011 Annual Conference "PM from Fugitive/Agricultural/Open Sources" session. Dr. Lester gave an invited presentation to the U.S. Department of Agriculture/U.S. Environmental Protection Agency Agricultural Air Quality Task Force on ammonia as a particulate matter precursor.

Leytem, April

U.S. Department of Agriculture-Agriculture Research Service

Dr. April Leytem is a Research Scientist at the United States Department of Agriculture (USDA) Agriculture Research Service (ARS) in Kimberly, Idaho and is an adjunct faculty member of the University of Idaho and Purdue University. She holds a B.A. in Economics from Brandeis University (1991), an M.A. in Natural Resource Management - International Development from North Carolina State University (1993), and a Ph.D. in Soil Chemistry from North Carolina State University (1999). Dr. Leytem's research addresses problems in nutrient cycling in animal agriculture systems and conducts research to help assure sustainable animal production while better protecting water and air quality. For the past six years, she has been involved in several projects related to air quality and emissions from both dairy operations and land application of dairy waste, and development of strategies to reduce the impact of large scale animal operations on air quality. Dr. Leytem is the founder and lead of the newly formed USDA – ARS workgroup entitled Animal GRACEnet which is focused on ammonia and greenhouse gas emissions from animal production facilities. She is also member of a USDA Climate Change Program Office Workgroup to develop technical guidelines and scientific methods for the estimation of entity-scale greenhouse gas emissions and carbon sequestration from animal agriculture and lead on the dairy production section of this document.

Li, Hong

University of Delaware

Dr. Hong Li is an Assistant Professor in both Animal & Food Sciences and Bioresources Engineering Departments at University of Delaware. He holds a B.S. (1998) and M.S (2001) in Agricultural and Bioenvironmental Engineering from China Agricultural University, and a Ph.D. in Agricultural Structures and Environmental Systems Engineering from Iowa State University (2006). Dr. Li has research experience in animal (particularly poultry) environment research and extension, specialized in air quality issues with emphasis on quantification, modeling and mitigation of air emissions from animal feed operations. He also has extensive expertise and experiences in environmental monitoring instrumentation (installation, maintenance, and calibration), data processing and quality control for agricultural applications. Currently, Dr. Li is conducting research focusing on air emissions mitigation technologies for animal agriculture and improving animal environment and its production.

Lim, Teng Teeh

University of Missouri

Dr. Lim is an Extension Assistant Professor and Agricultural Engineer in the Division of Food Systems and Bioengineering, at the University of Missouri. He holds a B.S. (1995) and M.S. (1997) in Biosystems and Agricultural Engineering from the University of Kentucky, and a Ph.D. in Agricultural and Biological Engineering from Purdue University (2001). Dr. Lim's research areas include quantification and mitigation of odor and air emissions from modern animal production facilities, ventilation system performance, manure management, and odor setback and air emission models. He has developed a web-based, interactive setback distance model for pork production facilities. Dr. Lim is experienced in monitoring long-term and continuous emission rates from various commercial livestock and poultry facilities based on U.S. Environmental Protection Agency (EPA)-approved quality assurance project plans. He has in-depth experience with state-of-the-art olfactometry, gas chromatography, continuous gas (Ammonia, hydrogen sulfide, volatile organic compounds, and green house gases) and particulate matter (EPA Method 17, Tapered Element Oscillating Microbalance, and gravimetric) analyzers, and meteorological instruments. Dr. Lim has also characterized the effectiveness and practicality of several mitigation methodologies applied by the livestock industries. He is developing emission models for commercial swine barns based on part of the National Air Emission Monitoring Study dataset.

Maghirang, Ronaldo

Kansas State University

Dr. Ronaldo Maghirang is a Professor in Air Quality Engineering at the Department of Biological and Agricultural Engineering at Kansas State University (KSU). He holds a B.S. in Agricultural Engineering (1982) and M.S. in Agrometeorology (1986) from the University of the Philippines, and a Ph.D. in Agricultural Engineering from Pennsylvania State University (1992). Dr. Maghirang's current research efforts include characterization, measurement, modeling, and control of air emissions from animal feeding operations; measurement and modeling of fugitive dust from off-road activities; numerical simulation of particle collection by vegetative barriers; and environmental applications of nanotechnology. He also teaches senior/graduate level courses, including air pollution engineering and aerosol science and technology. Dr. Maghirang is currently the Editor for the Structures and Environment Division of the Transactions of the American Society of Agricultural and Biological Engineers (ASABE) and Applied Engineering in Agriculture. He served as the ASABE Structures and Environment Division Program Chair, Program Chair of two ASABE international conferences, Associate Editor for ASABE, and Chair of several ASABE technical committees. He also served as member of the 2009 U.S. Department of Agriculture (USDA) Air Quality proposal review panel and several ad hoc review panels for USDA, National Science Foundation, and other agencies.

Marsh Johnson, Trisha

Veterinary & Environmental Technical Solutions

Dr. Trisha Marsh Johnson is the owner of Veterinary & Environmental Technical Solutions, a full-service consulting firm providing food safety, environmental management, and regulatory and policy solutions for the animal agriculture sector. She holds a B.S. in Animal Science from the University of Maryland (1992), a D.V.M. from Oklahoma State University (1995), and a post-DVM Master of Avian Medicine from the University of Georgia (1996). Dr. Johnson's work in agricultural air quality has focused on ammonia and volatile organic compound (VOC) emissions in the poultry and dairy sectors. She has concentrated on the impact of management practices in the production environment and animal physiology on biologically derived gaseous air emissions from Concentrated Animal Feeding Operations. As a veterinarian, Dr. Johnson brings a unique perspective to the air emissions arena where the physiology and growth cycle of the animal influencing emission generation is often overlooked. She worked closely with the U.S. Department of Agriculture (USDA) Agricultural Air Quality Task Force for 6 years and served a 2-year term on the Task Force from 2006-2008 as an animal production representative. Dr. Johnson works closely with poultry farmers through farm assessments and group training to reduce air emissions from production facilities through proper litter management and ventilation during the production cycle. She has conducted or been involved in numerous field studies of ammonia generation and emissions reduction and nitrogen mass balance of broiler farms. Previously, she was the Veterinary Services Manager for Jones-Hamilton Co for nine years providing technical assistance to the domestic and international poultry industry on pre-and post-harvest food safety, Hazard Analysis and Critical Control Points (HACCP) program development, and management of the production environment including ammonia management. Dr. Johnson is board-certified by the American College of Poultry Veterinarians. Prior to joining Jones-Hamilton Co., Dr. Johnson served as an intern for Simmons Foods, Perdue Farms, U.S. Food and Drug Administration Center for Veterinary Medicine, the Animal Health Institute and the American Veterinary Medical Association Governmental Relations Division.

Meyer, Deanne

University of California, Davis

Dr. Deanne Meyer is a Research Scientist and Cooperative Extension Specialist in the Department of Animal Science at the University of California, Davis (UC Davis). She holds a B.S. in Animal Science from UC Davis (1983) and an M.S. in Dairy Science (1986) and a Ph.D. (1989) in Animal Science from the University of Florida, Gainesville. Dr. Meyer's research analyzes production, collection, storage, transportation, and utilization of manure management waste stream(s) on livestock facilities with an emphasis on commercial dairies. Her research has focused on nutrient flows into, through and out of dairy operations including: content of manure solids and liquids, water use, efficiency of mechanical and gravity flow separator devices, analyses of other treatment technologies, nutrient distribution during land applications, and ammonia volatilization and PM10 emissions. Based on her experiences in research and policy development related to atmospheric emissions, Dr. Meyer has served twice as panel manager for the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) Air Quality grant review process. She maintains an active collaboration with San Joaquin Air District Staff since initial development of Volatile Organic Compound (VOC) dairy cattle emission rates (2005) to assist with understanding mitigation measures for implementation by dairy operators. Dr. Meyer worked with colleagues to reformat Table D384.1 Manure Characteristics Standard for the American Society of Agricultural and Biological Engineers. These landmark modifications (2005) allowed an end user to include biological input (dietary parameters) to estimate manure and nutrient excretion and not solely rely on body weight. This was the first major revision to the Table D384.1 since its inception. Dr. Meyer has served on numerous advisory committees working with Federal, State, and Regional regulatory agencies to better understand potential for nutrients from dairy production operations to be emitted to soil, ground or surface water, or air. Dr. Meyer was a primary contributor to Livestock and Poultry subcommittee responsible for white paper for U.S. Department of Agriculture-Natural Resources Conservation Service Agricultural Air Quality Task Force, Recommended Units and Supporting Data for Standardized Reporting of Air Emissions from Animal Agriculture (2010). Dr. Meyer maintains an active outreach program to educate dairy operators and professionals in water and air regulatory compliance requirements. Through this process she regularly interacts with stakeholders and regulatory staff to provide scientific input and better understand needs of each agency.

Mitloehner, Frank

University of California, Davis

Dr. Frank Mitloehner is an Associate Professor and Air Quality Specialist in Cooperative Extension at University of California, Davis. He holds an M.S. in Animal Science and Agricultural Engineering from the University of Leipzig, Germany (1996) and a Ph.D. in Animal Science from Texas Technical University (2000). Dr. Mitloehner is an expert for agricultural air quality, animal-environmental interactions, and environmental engineering. Since he joined the faculty in the Department of Animal Science at the University of California- Davis in 2002, he has generated and published data that are rapidly changing how livestock facilities in California and throughout the US are regulated. Dr. Mitloehner is the Principle Investigator of a broad range of studies and has authored 50+ publications in refereed journals. He serves as Director of the UC Davis Agricultural Air Quality Center.

Mosier, Arvin

Independent Consultant

Dr. Arvin Mosier works part time as a consultant and holds an honorary appointment within the Melbourne School of Land and Environment as a Principal Fellow. He also is a volunteer in the Agricultural and Biological Engineering Department at the University of Florida. Dr. Mosier holds a B.S. (1967) and M.S. (1968) in Chemistry, and a Ph.D. in Soil Science (1974) from Colorado State University. His consulting work focuses on linking the carbon and nitrogen cycles to mitigate agricultural greenhouse gases. Dr. Mosier's role at the University of Melbourne (Australia), for a month each year through 2012, is to consult and provide guidance for two programs within the Department of Resource Management and Geography. These programs focus on improving the efficiency, profitability and environmental friendliness of nitrogen fertilizers, and quantifying and mitigating ammonia and greenhouse gas emissions from livestock and dairy production systems. His interest at the University of Florida involves food security in the developing world. Dr. Mosier conducted research as a research chemist with United States Department of Agriculture/Agricultural Research Service (USDA/ARS) (1965-2004) on various aspects of agriculture, many of which were related to the impact of agriculture on air quality. During the late 1970s he was part of a team who quantified the emissions of ammonia and amines from cattle feedlots. During the last 20 years of his 39+ years with ARS he conducted research in the area of soil nitrogen transformations and their relationship to gaseous losses of nitrogen compounds (ammonia, nitric oxide, nitrous oxide) from the soil to the atmosphere. Collaborative research with scientists from around the USA, Europe, Australia and Asia resulted in the publication of more than 240 scientific publications, the majority of which were related in some way to air quality. During this time Dr. Mosier mentored >15 graduate students and post doctoral fellows. He co-chaired the Intergovernmental Panel on Climate Change (IPCC) National Greenhouse Gas Methodology for Agricultural Soils (1997). In 2004 Dr. Mosier chaired the Scientific Committee on Problems of the Environment (SCOPE) project on Fertilizer Nitrogen Rapid Assessment Project that led to the publication of a book that he co-edited entitled Agriculture and the Nitrogen Cycle: Assessing the Impacts of Fertilizer Use on Food Production and the Environment. Following his retirement from USDA/ARS in December, 2004, Dr. Mosier served as a science officer for the international program: Global Environmental Change and Food Systems in association with the Agricultural and Biological Engineering Department of the University of Florida (2005-2007). He served an external advisor for a European Union-wide research project on "The nitrogen cycle and its influence on the European greenhouse gas balance" NitroEurope. This 5-year project, which began in January 2006, involved 65 different research institutions within the European Union. In 2009 he was awarded an honorary appointment with the Melbourne (Australia) University School of Land and Environment as a Principal Fellow. Dr. Mosier served on a U.S. Environmental Protection Agency science advisory board committee on integrated nitrogen. Work on this committee began in January 2007 and the committee report was published in August, 2011. Since 2007 he has reviewed > 10 project proposals for the Clean Development Mechanism (CDM) for the United Nations Framework Convention on Climate Change (UNFCCC) Methodology Panel.

Mukhtar, Saqib

Texas A&M University

Dr. Saqib Mukhtar is a Professor and Extension Agricultural Engineer in the Biological and Agricultural Engineering Department at Texas A&M University. He holds a B.S. in Agricultural Engineering from the University of Agriculture, Faisalabad, Pakistan (1981), and an M.S. (1985) and a Ph.D. (1989) in Agricultural Engineering from Iowa State University. Dr. Mukhtar has 21 years of experience in the area of animal manure and wastewater management to protect air and water quality. He has researched and published extensively on estimating ammonia, hydrogen sulfide and greenhouse gas emissions from animal feeding operations, and on animal manure and process waste water management technologies to reduce soil, water and air pollution. Dr. Mukhtar's research and extension activities include assessment of new and innovative technologies to reduce greenhouse gases, ammonia and other air pollutants from animal feeding operations, and to build extension outreach and education capacity to move animal production towards practices that are environmentally sound, climatically compatible, and economically viable. He has served on the U.S. Department of Agriculture (USDA)-Agriculture Research Service National Program Review team for Program 206: Manure and Byproduct Utilization in 2008. Dr. Mukhtar continues to serve on several USDA National Institute of Food and Agriculture (NIFA) proposal review panels. Dr. Mukhtar is a registered professional engineer in the State of Texas.

Nachman, Keeve E.

Johns Hopkins Bloomberg School of Public Health

Dr. Keeve E. Nachman is an Assistant Scientist in the Departments of Environmental Health Sciences and Health Policy and Management at the Johns Hopkins Bloomberg School of Health (JHSPH), and directs the Farming for the Future Program at the Johns Hopkins Center for a Livable Future. He holds a B.A. in Writing Seminars from the Johns Hopkins University (1999), and an M.H.S. in Environmental Health Sciences with a focus in Radiation Health Sciences (2001) and Ph.D. in Environmental Health Policy (2006) from Johns Hopkins University School of Public Health. Dr. Nachman completed his postdoctoral training as an environmental health scientist and fellow in the National Center for Environmental Economics within the Office of Policy, Economics and Innovation at the U.S. Environmental Protection Agency and has worked as a toxicologist and risk assessor for the U.S. Army Corps of Engineers. His current research addresses the potential impact of food production methods on public health and environmental quality, focusing on how chemical and microbial contaminants in solid and liquid waste streams and airborne releases from food animal production sites reach and potentially impact rural community health. Dr. Nachman's past work has included study of the multi-natured contaminants of animal waste, epidemiologic investigations of the relationship between population exposures to particulate matter and birth and respiratory outcomes, as well as pesticide and veterinary drug use policies.

Ni, Jiqin

Purdue University

Dr. Jiqin Ni is Assistant Professor at Department of Agricultural and Biological Engineering at Purdue University. He holds a B.A. from Zhejiang University, China (1989), and an M.S. in Agronomy (1991) and Ph.D. in Agricultural Engineering (1998) from Catholic University of Leuven, Belgium. Dr. Ni's work experiences include Associate Director in Hangzhou Rural Energy Office on research and extension on renewable energy resources in China, and Research Engineer on agricultural air quality in KUL, Belgium. After he joined Purdue University in 1997, he worked as Research Associate, Research Assistant Professor, and Research Associate Professor on agricultural air quality. Dr. Ni's research interest is in knowledge, methodology, and technology in environmental protection, including air pollution assessment and mathematical modeling; measurement of baseline gases (ammonia, carbon dioxide, methane, and hydrogen sulfide), odor, and dust at animal agriculture using advanced setup and instruments; design of state-of-the-art laboratory and field experiment systems; development of data acquisition and control software, data processing software, quality assurance project plans (QAPP), and standard operating procedures (SOP); laboratory and field tests of air pollution control technologies, and data processing, analysis and interpretation. Dr. Ni has published extensively on agricultural air quality monitoring, baseline emission, and mitigation technology evaluation.

Ogejo, Jactone Arogo

Virginia Polytechnic Institute and State University

Dr. Jactone Arogo Ogejo is an Associate Professor and Extension Specialist at Virginia Tech. He holds a B.S. in Agricultural Engineering from the University of Nairobi, Kenya (1983), and an M.S. (1989) and Ph.D. (1997) in Agricultural and Biological Engineering from the University of Illinois at Urbana-Champaign. Dr. Ogejo's research is centered on the understanding how aerial pollutants are formed and released from sources and management of manure and other agricultural residues to minimize their environmental pollution potential. His current research focuses on (1) mitigation of ammonia emissions from broiler houses and dairy manure and (2) nutrient and energy recovery from manure. Dr. Ogejo and his colleagues have developed a biodegradable product called "amosoak" from agricultural crop residues that can be used to mitigate ammonia emissions from manure. They are currently testing this product at pilot scale. His work in agricultural air quality also includes developing process based models to estimate ammonia emissions from animal feeding operations. This aspect of his work recognizes the difficulty and expenses involved in doing actual measurement of aerial emissions from animal feeding operations. Dr. Ogejo is one of the pioneering scientists to engage in developing process based models to estimate ammonia emissions from animal feeding operations. Before coming to Virginia Tech, most of his work focused on ammonia emissions from swine feeding operations. As part of his work in modeling, Dr. Ogejo uses global sensitivity approach to give a better understanding of the model parameters and their uncertainties, rather than the commonly used local sensitivity approaches. He has been at Virginia Tech since 2005 and before that, he worked at North Carolina State University for five years on projects to reduce ammonia and odor emissions from swine production facilities. Dr. Ogejo's current research is funded by U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), National Fish and Wildlife Foundation, Farm Pilot Project Coordination Inc., State of Virginia's departments of Mines, Mineral and Energy and Environmental Quality, and Virginia Agricultural Council.

O'Shaughnessy, Patrick

University of Iowa

Dr. O'Shaughnessy joined the faculty at the University of Iowa in 1997 where he now holds the rank of Professor with a joint appointment in the Departments of Occupational and Environmental Health and Civil and Environmental Engineering. He holds a B.S. in Wildlife Biology (1980), an M.S. in Civil Engineering (1993) and a Ph.D. in Environmental Engineering (1996) from the University of Vermont. With over 50 publications in peer-reviewed literature, Dr. O'Shaughnessy is a recognized scholar in the field of aerosol physics and human exposure assessment applied to occupational and environmental health concerns. His current research is associated with developing assessment methods for nanoparticles in the workplace, analyzing dust exposures relative to tasks performed in swine rearing facilities, and the dispersion of contaminants from agricultural buildings. Dr. O'Shaughnessy has therefore gained research experience dealing with both indoor and outdoor contaminant exposure issues related to modern swine buildings. He applied a novel method that incorporated a plume dispersion model to back-calculate hydrogen sulfide emissions from swine operations that proved to be remarkably consistent when scaled for the number of pigs in each operation. Dr. O'Shaughnessy obtained licensure as a Certified Industrial Hygienist (CIH) in 2008.

Overhults, Douglas G.

University of Kentucky

Dr. Doug Overhults is an Extension Professor in the Biosystems & Agricultural Engineering Department at the University of Kentucky, located at the University of Kentucky Research & Education Center in Princeton, KY. He holds a B.S. (1970) and M.S. (1975) in Agricultural Engineering from the University of Kentucky, and a Ph.D. in Bio-Environmental Engineering from the University of Nebraska (1982). Dr. Overhults' primary area of expertise is planning, analysis, and engineering design of efficient animal production facilities, environmental controls, structures, and manure management systems. In those areas, he has statewide responsibilities for Cooperative Extension educational programs and also conducts various research projects. Recently he completed work on a joint project with Iowa State University to measure dust and gaseous emissions from broiler houses in Kentucky. Currently he is leading a project to evaluate and improve on-farm energy efficiency in the Kentucky broiler industry. Dr. Overhults is a registered professional engineer and an active member of the American Society of Agricultural & Biological Engineers where he has previously chaired the Swine Housing and Animal Environment committees. He also served two terms as chairman of the Structures and Environment Division and is currently a member of the Poultry Housing, Swine Housing and Animal Environment committees.

Parker, David B.

United States Department of Agriculture - Agriculture Research Service

Since March, 2010, Dr. David B. Parker has been the Research Leader of the Environmental Management Research Unit at the United States Department of Agriculture - Agriculture Research Service (USDA-ARS) U.S. Meat Animal Research Center in Clay Center, Nebraska. Dr. Parker holds a B.S. in Agricultural Engineering from New Mexico State University (1985), an M.S. in Agricultural Engineering from University of Wyoming (1987), and a Ph.D. in Biological Systems Engineering with a focus on animal waste management from the University of Nebraska-Lincoln (1996). Dr. Parker has more than 24 years of experience as an environmental and air quality engineer. As administrative leader of the Environmental Management Research Unit at USDA-ARS's U.S. Meat Animal Research Center, he supervises five Ph.D. scientists/engineers and five research technicians, and is responsible for all research planning and budgetary oversight. His personal research focus at the U.S. Meat Animal Research Center is on the measurement and abatement of odor, volatile organic compound (VOC), ammonia, hydrogen sulfide (H₂S) and greenhouse gas emissions (methane, carbon dioxide, and nitrous oxide) from animal feeding operations. Prior to working for the USDA, Dr. Parker spent thirteen years at West Texas A&M University in Canyon, Texas, holding the ranks of Assistant, Associate, and full Professor in the Department of Agricultural Sciences. At West Texas A&M, Dr. Parker taught courses in agricultural waste management, agricultural statistics, and environmental statistics. He conducted research on air quality emissions from animal feeding operations and other agricultural sources. Dr. Parker also served as the Director of the Odor and GC/MS Research Laboratories at West Texas A&M University where he provided outside sampling services to industry and other research organizations. While at the University of Nebraska, he received the Widaman Trust Distinguished Graduate Student Award and the Mid-Central American Society of Agricultural and Biological Engineers (ASABE) Graduate Student of the Year Award. After obtaining his M.S. in Agricultural Engineering from the University of Wyoming in 1987, Dr. Parker worked for seven years as an environmental consulting engineer for large companies in Idaho and Washington. During his career, he has received numerous awards including the 2010 Notable Technology Development Award presented by the Federal Laboratory Consortium for Technology Transfer, the 2010 Texas A&M Vice Chancellor's Award for Excellence in Air Quality Research, the 2008 Texas Environmental Excellence Award in Agriculture presented by the Governor and Senate of the State of Texas, the 2002 Agricultural Engineer of the Year presented by the Texas Section of the American Society of Agricultural Engineers, and two ASABE Superior Paper Awards in 1999 and 2001. Dr. Parker is the author of more than 180 research articles, conference proceedings, book chapters and abstracts.

Parnell, Calvin B.

Texas A&M University

Dr. Calvin B. Parnell, Jr. is a Regents Professor, Director of the Center for Agricultural Air Quality Engineering and Science (CAAQES) and holder of the of the Cotton Engineering, Ginning and Mechanization Chair in the Department of Biological and Agricultural Engineering at Texas A&M University. He holds a B.S. in Agricultural Engineering from New Mexico State University (1964), and an M.S. in Agricultural Engineering (1965) and Ph.D. in Environmental Systems Engineering (1970) from Clemson University. Dr. Parnell served as a member of the Texas Air Control Board (TACB) from 1989-1993 which, at the time, was the ruling body of the State Air Pollution Regulatory Agency (SAPRA) in Texas. The SAPRA in Texas is currently the Texas Commission of Environmental Quality (TCEQ). He served four two-year terms (1997-2006) as a member of the Agricultural Air Quality Task Force (AAQTF). The AAQTF advises the Secretary of Agriculture on air pollution research needed to insure that agricultural operations are appropriately regulated. Dr. Parnell has taught an undergraduate course entitled "Air Pollution Engineering" for students in the college of engineering every fall semester since 1992. He also has taught a more advanced "Air Pollution Engineering" graduate course every other year since 1995. Dr. Parnell served on the National Academy of Science (NAS) Committee on Air Emissions from Animal Feeding Operations (2002 to 2004) and participated in writing the publication entitled "Air Emissions from Animal Feeding Operations-Current Knowledge, Future Needs"(2003). He did the research that resulted in the 1D3D and 1D2D cyclone designs which are considered Best Available Control Technology (BACT) for abating particulate emissions from agricultural operations in many states. Although the cyclone designs were intended for cotton gins, the 1D3D and 1D2D cyclones have been utilized in the permitting of a wide range of stationary sources including grain elevators and feed mills. Dr. Parnell started his research career as an engineer with the U.S. Department of Agriculture (USDA) Cotton Ginning Research Laboratory in Lubbock, Texas developing Particulate Matter (PM) emission factors for cotton gins in 1970. He has continued his focus on determining air pollution emission factors. Dr. Parnell has led the efforts to determine accurate emission factors for cotton harvesting operations, almond harvesting, grain elevators, oil mills, feed mills, cattle feed yards, dairies, and poultry operations. He is one of the inventors on the two patents related to using fluidized bed gasification of biomass to produce usable energy. Dr. Parnell's research efforts include addressing inaccurate measurements of PM₁₀, PM_{10-2.5} and PM_{2.5} ambient concentrations from both fugitive and stationary agricultural sources with federal reference methods (FRM) samplers. He has published findings documenting the significant errors in the concentrations measured using FRM samplers in the presence of the large PM typical of the PM emitted by agricultural operations. (This is referred to as "over-sampling".) Dr. Parnell has also found that concentration measurements utilizing the "Tapered Element Oscillating Microbalance" (TEOM) samplers are affected by the large PM emitted by agricultural operations. He and the CAAQES faculty have developed protocols for concentration measurements of PM and gases emitted by many agricultural sources that are based upon sound science. These concentration data are used with reverse dispersion modeling to produce more accurate emission factors and fluxes than those listed by the U.S. Environmental Protection Agency (EPA) in AP-42. Dr. Parnell's research priorities have been and continue to be (1) economically feasible but effective abatement strategies; (2) accurate emission factors based upon concentration measurements and well designed and tested protocols; and (3) technical knowledge to counter enforcement actions of agricultural operations that are not justified and result in inappropriate regulation of agricultural operations. Dr. Parnell is currently working on issues related to combustible dust that could result in inappropriate regulation of agricultural operations by OSHA in the near future. He has a large number of former students employed by regulatory agencies, consulting firms, universities and governmental agencies. They regulate air pollution; permit facilities; operate cotton gins, grain elevators and feed mills; design air pollution abatement systems; teach at the university level; and perform research related to reducing air pollution. He is a retired LTC from the Army reserve and a registered Professional Engineer in Texas.

Pollard, Terry L.

Big Dutchman USA

Mr. Terry L. Pollard is Vice President for Sales & Marketing at Big Dutchman USA, a company located in Holland Michigan that designs and builds cage, cage-free, and colony housing systems for egg laying hens. He holds a B.S. in Food Science and Technology from Michigan State University, and an MBA from Franklin University. Mr. Pollard has personally visited 80% or more of the egg production and egg processing facilities in the United States over the last 30 years. His current expertise is in the field of laying hen housing equipment design for enriched colony systems and cage-free aviary systems. This includes the feeding, watering, and ventilation systems required in order to meet the bird's needs and to optimize the operating efficiencies of the entire facility. Mr. Pollard has a good operating understanding of engineered air flows that affect the animals and environment inside and outside the housing barn, and has years of experience and knowledge in the operating performance of air quality systems in the beverage, brewery, bakery, meat, pharmaceutical, and egg production industries. He is deeply familiar with the array of practical considerations that go into egg production, including the technology and management systems characteristic of modern egg laying operations. Over his last three years with Big Dutchmen, Mr. Pollard has placed a particular emphasis on ventilation aspects of large layer house facilities. Big Dutchman has planned and carried out feeding systems and housing equipment for modern poultry management operations since 1938, offer practical, economical and environment-friendly solutions, and are the recognized market leader in the entire industry. Mr. Pollard is an active participant and a leader in the associations important to the egg and agricultural industry, including the United Egg Allied industry organization, several State egg industry organizations, and the American Egg Board where her serves as the Allied Industry advisor. He has served as allied chairman of the United Egg Association. Mr. Pollard has worked closely with U.S. Department of Agriculture (USDA) officials responsible for the federal egg inspections programs.

Powell, J. Mark

U.S. Department of Agriculture – Agriculture Research Service

Dr. J. Mark Powell is a Soil Scientist at the U.S. Department of Agriculture (USDA) - Agriculture Research Service (ARS) U.S. Dairy Forage Research Center, Madison Wisconsin, and a Professor in the Department of Soil Science at the University of Wisconsin-Madison. He holds a B.S. in Agronomy from Clemson University (1979), an M.P.S. in International Agriculture and Rural Development from Cornell University (1981), and a Ph.D. in Agronomy from Texas A&M University (1989). Dr. Powell is an internationally recognized authority on environmental impacts of mixed crop-livestock systems in temperate, sub-tropical, and tropical environments. His research encompasses soil, crop/pasture, animal and social sciences in an agro-ecological approach to understand nutrient cycling and gaseous emissions from livestock production systems. Dr. Powell has published approximately 190 research papers, refereed journal articles, book chapters, monographs, and technical bulletins that highlight the necessity for functional integration of feed/livestock/manure/soils-crops to optimize nutrient use and reduce gaseous emissions. He currently serves on various national and international research committees related to gaseous emissions from livestock. These appointments include U.S. representative on Technical Advisory Committee for the Livestock Emissions Abatement Research Network (LEARN), Wellington, New Zealand; Chair, External Review Panel: Adapting Livestock Systems to Climate Change, U.S. Agency for International Development (USAID) Collaborative Research Support Program; Member of USDA-ARS Animal Systems GRACEnet; Member, Animal Agriculture Working Group, USDA Office of the Chief Economist, Climate Change Program, which has been tasked to write "Science-Based Methods and Technical Guidelines for Quantifying Greenhouse Gas Sources and Sinks in the Forest and Agriculture Sectors"; and Chair of Dairy Waste Air Emissions Advisory Group for Wisconsin's Department of Natural Resources.

Powers, Wendy J.

Michigan State University

Dr. Wendy Powers is Professor of Animal Science and Biosystems & Agriculture Engineering at Michigan State University where she is also Director of the Agriculture and Agribusiness Institute for Michigan State University Extension. She holds a B.S. in Animal Science from Cornell University (1989), and an M.S. in Dairy Science (1993) and a Ph.D. in Animal Science (1997) from the University of Florida. Dr. Powers' research focuses on diet modification to alter odor and gaseous emissions and manure nutrient excretion working in a multispecies capacity. Her extension efforts are currently focused on implementation of management practices to reduce environmental impact and addressing the concerns of rural citizens by improving understanding and communication. As Director of Environmental Stewardship for Animal Agriculture in the College of Agriculture and Natural Resources, Dr. Powers coordinates environmental activities related to animal agriculture for the college. In her role as Director of the Agriculture and Agribusiness Institute for Michigan State University Extension, she oversees statewide Extension activities across the breadth of agriculture in Michigan.

Prueger, John H.

U.S. Department of Agriculture – Agriculture Research Service

Dr. John H. Prueger is a Micrometeorologist at the U.S. Department of Agriculture (USDA) – Agriculture Research Service (ARS) National Laboratory for Agriculture and the Environment in Ames, Iowa. He holds a B.S. in Soil Science from the California State University at Fresno (1980), an M.S. in Plant Science from California State University at Fresno (1986), and a Ph.D. in Micrometeorology from Utah State University (1991). Dr. Prueger's research addresses problems in science, technology. Much of his research has involved the development of measurement techniques to measure, characterize and develop new understanding in the turbulent exchange processes at the boundary layer between a surface and that part of the atmosphere directly influenced by the surface. Dr. Prueger's work includes turbulent exchange and transport of heat, water vapor (evaporation), carbon dioxide and pesticide vapors from agricultural production systems, native ecosystems, and particulate emissions from confined animal facilities.

Robarge, Wayne P.

North Carolina State University

Dr. Wayne P. Robarge is a Professor of Soil Physical Chemistry in the Department of Soil Science at North Carolina State University (NCSU). He holds a B.S. in General Agriculture (1969) and an M.S. in Soil Science (1971) from Cornell University, and a Ph.D. in Soil Science from the University of Wisconsin-Madison (1975). Dr. Robarge was raised on dairy farms in northern Wisconsin and upstate New York. He joined the NCSU faculty in 1977. Throughout his career he has focused his interests in chemistry, especially the chemistry of agricultural and natural systems. In the early 1980s, he was one of several NCSU scientists who reported on forest decline in the mountains of NC, which led to his involvement with the U.S. Forest Service Forest Response Program and the U.S. Environmental Protection Agency (EPA) Mountain Cloud Chemistry Program. In the 1990s, Dr. Robarge continued his collaboration with other scientists at NCSU to look at emissions of global greenhouse gases from the Amazon basin in Brazil, and ozone precursors from agricultural row crops in NC. More recently, he has focused his efforts on understanding the fate and transport of emissions from animal feeding operations in NC. Dr. Robarge works closely with the State of North Carolina Division of Air Quality, N.C. Department of Environment and Natural Resources, and with EPA's offices located in Research Triangle Park, NC. He has served as a member of the U.S. Department of Agriculture (USDA) Agricultural Task Force on Air Quality and was a member of the National Research Council/National Academy of Sciences study on air emissions from animal feeding operations. Dr. Robarge was Panel Manager for the first review of proposals funded in 2004 under the then new Air Quality program in the USDA. He was a member on the science team conducting evaluations of the proposed environmentally superior technologies for handling swine waste under the North Carolina Attorney General – Smithfield et al. Agreement, and was the lead project leader for the two swine sites representative of the Southeastern U.S. in the National Air Emissions Monitoring Study (NAEMS). Dr. Robarge also supervises a central analytical service center on the NCSU campus, with expertise in a range of analytical instrumentation, including calibration, and evaluation of method detection limits, sensitivities and estimation of uncertainty using standard propagation of error techniques. He is a Fellow of the Soil Science Society of America.

Rotz, C. Alan

U.S. Department of Agriculture-Agriculture Research Service

Dr. Al Rotz is an Agricultural Engineer with the U.S. Department of Agriculture's Agricultural Research Service (ARS). He holds a B.A. in Liberal Arts from Elizabethtown College (1974), and a B.S. in Mechanical Engineering (1974) and an M.S. (1975) and Ph.D. (1977) in Agricultural Engineering from The Pennsylvania State University. Since 1997, Dr. Rotz has served as lead scientist on the integrated farming systems project at ARS's Pasture Systems and Watershed Management Research Unit in University Park, PA. Dr. Rotz has led ARS's development of a farm simulation model used to evaluate and compare the performance, economics, and environmental impact of farm production systems. His current work emphasizes the measurement and modeling of gaseous emissions from farms including ammonia, hydrogen sulfide, volatile organic compounds, and greenhouse gases. Dr. Rotz has created an educational software tool called the Dairy Gas Emissions Model (DairyGEM), which uses process simulation to estimate gaseous emissions from dairy production systems and evaluate the effects of various mitigation strategies. He has worked extensively with data collected by the National Air Emissions Monitoring Study in the evaluation of his process-based emission models. Dr. Rotz grew up on a dairy farm in southern Pennsylvania. He spent three years as an Assistant Professor at Michigan State University before joining the Agricultural Research Service in 1981. For 16 years, Dr. Rotz led the East Lansing Cluster of the U.S. Dairy Forage Research Center. He is a member of the Pennsylvania Forage and Grassland Council, the American Forage and Grassland Council, and the American Dairy Science Association. Dr. Rotz is a Fellow of the American Society of Agricultural and Biological Engineers and a registered Professional Engineer in the State of Michigan.

Rudek, Joseph

Environmental Defense Fund

Dr. Joseph Rudek is a Senior Scientist with the Environmental Defense Fund, a position he has held since 1996. He holds a B.A. in Biology and Chemistry from the University of California-Santa Cruz (1980), and an M.S. (1987) and Ph.D. (1992) in Environmental Biology from the University of North Carolina at Chapel Hill. Dr. Rudek also holds an Adjunct Associate Professorship in the Department of Earth, Marine and Atmospheric Sciences at North Carolina State University (NCSU). He works on issues related to water quality and aquatic ecology in coastal, intertidal, estuarine and freshwater ecosystems, as well as air quality issues related to agricultural emissions from livestock production. Dr. Rudek focuses on nutrient pollution and the wider atmospheric and aquatic implications of excess nitrogen pollution. He played a key role in the passage of North Carolina legislation which set the highest environmental performance standards for hog operations in the US. Dr. Rudek has served on the North Carolina Lagoon Conversion Program Advisory Committee, the NC State University Center for Environmental Farming Systems pasture-based hog production Conservation Innovation Grant Advisory Committee, NC Water Resources Research Institute Advisory Committee, NCSU Animal and Poultry Waste Management Advisory Committee and the U.S. Department of Agriculture (USDA) Agricultural Air Quality Task Force. He has written numerous reports on animal waste management and associated issues.

Sampson, Paul D.

University of Washington

Dr. Paul D. Sampson is Research Professor of Statistics at the University of Washington. He holds an Sc.B. (1973) and an Sc.M. (1974) in Applied Mathematics from Brown University and a Ph.D. (1979) in Statistics from the University of Michigan (U.W.). He has been the Director of the Statistical Consulting Program since shortly after he arrived at the U.W. in 1981 and he served as Assistant Director of the EPA-funded National Research Center for Statistics and the Environment at the U.W. from 1996 to 2002. Dr. Sampson's research has included the development and application of multivariate analyses, especially Partial Least Squares methods, to problems in morphometrics and psychometrics. He has been involved for almost 30 years in the development of models for spatio-temporal environmental monitoring data, especially air quality, and he is well-known for introduction of the Sampson-Guttorp spatial deformation model for nonstationary spatial covariance structure. He continues to work in this area, developing models for prediction of exposure to air pollution in environmental health studies.

Simcik, Matthew F.**University of Minnesota**

Dr. Matt F. Simcik is an Associate Professor of Environmental Chemistry in the Division of Environmental Health Sciences in the School of Public Health at the University of Minnesota. He holds a B.S. in Chemistry from Michigan State University (1992), an M.S. in Civil Engineering from the University of Minnesota (1994), and Ph.D. in Environmental Science from Rutgers University (1998). Dr. Simcik's research interests are in the fate and transport of organic contaminants, particularly in terrestrial and aquatic systems. His specific research includes air-water exchange, gas-particle partitioning, atmospheric deposition and source apportionment of organic contaminants in the atmosphere.

Smith, Eric P.**Virginia Technological University**

Dr. Eric P. Smith is Chair of the Department of Statistics at Virginia Technological University. He holds a B.S. in Mathematics from the University of Georgia (1975), and an M.S. from University of Washington (1982) and Ph.D. from University of Washington (1982) in Biomathematics. Dr. Smith has been a member of the Virginia Technological University faculty since 1982. His research focuses on the development and application of statistical methods to help understand and solve environmental and ecological problems. Dr. Smith was the Director of the Statistical Consulting Center 1995-2004. In that position he was responsible for providing statistical support to students, faculty and staff and provided training to statistics students on the art of consulting. Dr. Smith has worked on a variety of statistical and scientific problems from areas such as engineering, education and natural resources. He teaches courses on multivariate analysis and linear models (regression, analysis of variance). Dr. Smith is a former Associate Editor of *Environmetrics*, the *Journal of Agricultural, Biological and Environmental Statistics*, and the *Journal of the American Statistical Association*. He has supervised 14 Ph.D. students.

Smith, John F.**University of Arizona**

Dr. John F. Smith is a Dairy Extension Specialist/Professor at The University of Arizona. He holds a B.S. in Animal Science (1984) and a M.S. in Agriculture (1986) from Northwest Missouri State University, and a Ph.D. in Dairy Science from the University of Missouri (1990). Dr. Smith has served as the Extension Dairy Specialist at New Mexico State University from 1989-1995 and as Extension Specialist, Dairy Science in at Kansas State University (KSU) from 1995-2011. His research interests include cow comfort, heat stress, milking parlor performance, special needs facilities, and management of expanding dairies. Dr. Smith's responsibilities at KSU included management of the Dairy, Dairy Commodity Group leader and Program leader for Extension in the Department of Animal Sciences and Industries. In 2000 he received the Midwest Outstanding Young Extension Specialist Award, in 2002 the DeLaval Dairy Extension Award, in 2008 Western Dairy Business magazines' Outstanding Dairy Industry Educator/Researcher. In 2010 Dr. Smith received the Bell Tower of Fame Award for his efforts in dairy education and research. He is one of the Co-Founders of the Western Dairy Management Conference and High Plains dairy Management Conference. Dr. Smith works throughout the United States and internationally helping producers to develop efficient dairy operations.

Smith, Richard L.

University of North Carolina

Richard L. Smith is Mark L. Reed III Distinguished Professor of Statistics and Professor of Biostatistics in the University of North Carolina, Chapel Hill. He is also Director of the Statistical and Applied Mathematical Sciences Institute, a Mathematical Sciences Institute supported by the National Science Foundation. Dr. Smith holds a B.A. in Mathematics from Oxford University, and a Ph.D. in Operations Research from Cornell University. He previously held academic positions at Imperial College (London), the University of Surrey (Guildford, England) and Cambridge University. Dr. Smith's main research interest is environmental statistics and associated areas of methodological research such as spatial statistics, time series analysis and extreme value theory. He is particularly interested in statistical aspects of climate change research, and in air pollution including its health effects. Dr. Smith is a Fellow of the American Statistical Association and the Institute of Mathematical Statistics, an Elected Member of the International Statistical Institute, and has won the Guy Medal in Silver of the Royal Statistical Society, and the Distinguished Achievement Medal of the Section on Statistics and the Environment, American Statistical Association. In 2004 he was the J. Stuart Hunter Lecturer of The International Environmetrics Society. Dr. Smith is also a Chartered Statistician of the Royal Statistical Society. He is currently a member of the Research Committee of the Health Effects Institute.

Sweeten, John M.

Texas A&M University

Dr. John M. Sweeten is Professor and Resident Director of Texas AgriLife Research at Texas A&M University in Amarillo and Vernon, TX. He holds a B.S. in Agricultural Engineering from Texas Tech University (1965), and an M.S. (1967) and Ph.D. (1969) in Agricultural Engineering from Oklahoma State University. For the last sixteen years Dr. Sweeten has lead research programs for a multidisciplinary team of scientists dealing with cattle nutrition and health, environmental air and water quality, water management, wheat breeding and genetics, crop pest management, and rangeland restoration. He is a member of the graduate faculty at West Texas A&M University (WTAMU) and the Biological and Agricultural Engineering Department at Texas A&M University. Previously, Dr. Sweeten served as Professor, Extension Agricultural Engineer, and Associate Department Head in a 24-year career with the Department of Biological and Agricultural Engineering at Texas A&M University, College Station. He has authored/co-authored more than 500 publications, journal articles, papers, and reports on livestock and poultry manure management, air quality emissions assessment and abatement, land application of wastes, odor and dust control, feedlot runoff, manure harvesting, and bioenergy from feedlot and dairy manure. Dr. Sweeten co-authored one Patent (Reburn System with Feedlot Biomass. US Patent No. US 6,973,883) with another one pending. He is leading a multidisciplinary, multi-institutional U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) Research Project, now in its eighth year on "Air Quality: Reducing Emissions from Cattle Feedlots and Dairies (TX & KS)" involving 20 faculty/principal investigators from the Texas A&M University System (Texas AgriLife Research, Texas AgriLife Extension Service, West Texas A&M University), Kansas State University, and USDA Agriculture Research Service. Dr. Sweeten served as a member of the USDA Agricultural Air Quality Task Force (1998-2006), where he chaired a subcommittee on air quality emissions from concentrated animal feeding operations. For 10 years, he served as State Attorney General-appointed member of expert review panels for development and implementation of advanced air quality abatement technologies under consent decrees in North Carolina and Missouri in relationship to SmithField Foods and Premium Standard Farms, respectively. Dr. Sweeten is a registered professional engineer in Texas and a Fellow in the American Society of Biological and Agricultural Engineers.

Thu, Kendall

Northern Illinois University

Dr. Kendall Thu is a Presidential Engagement Professor and Chair of the Department of Anthropology at Northern Illinois University (NIU). He also serves as a Faculty Associate in NIU's Institute for the Study of the Environment, Sustainability, and Energy. Dr. Thu holds a B.A. in Anthropology from the University of California, Irvine (1982), and an M.A. (1984) and Ph.D. (1992) in Anthropology from the University of Iowa. Dr. Thu's research is based on an interdisciplinary approach to understanding the relationship between AFOs, including AFO emissions, public and occupational health, and the environment. He was recently elected to the American Anthropological Association's Committee on Ethics, served as editor of Culture and Agriculture, served on the Boards of the National Association of Practicing Anthropologists and the Central States Anthropological Society, and is a Fellow in the Society for Applied Anthropology. Dr. Thu also served as President of Culture and Agriculture and chaired the Committee on Public Policy for the American Anthropological Association. He served a two-year term on the U.S. Department of Agriculture (USDA)'s National Agricultural Air Quality Task Force under U.S. Secretary of Agriculture Dan Glickman.

Townsend, David

Smithfield Foods

Mr. David Townsend is Assistant Vice President of Environmental Affairs for Smithfield Foods in Shawnee, KS, and is the corporate liaison to the hog production subsidiary Murphy-Brown which has 827,000 sows and produces approximately 16 million hogs annually. He holds a BAS in Engineering Technology and Technical Management from the University of Delaware (1984). Mr. Townsend works internationally with hog production and meat processing in Poland, Romania and Mexico. He has worked in environmental management of the swine industry since 1996. Mr. Townsend has served on an advisory panel at North Carolina State University under the "Smithfield" agreement for evaluation of environmentally superior technology for the swine industry. Previously, he was also responsible for development of Next Generation Technology for implementation at a number of large swine farms in north Missouri under both state and federal agreements. The projects included baseline and post-implementation air emissions monitoring by academic and government researchers. Mr. Townsend presented industry perspectives to the National Academy of Sciences panel on animal feeding operations emissions and served on a panel that informed the study design for the National Air Emissions Monitoring Study for confined animal feeding operations (CAFOs). Murphy-Brown is a signatory to the CAFO air consent agreement and provided farms for study. Mr. Townsend is a member of the National Pork Board and National Pork Producers Council environmental committees and a past chair of the American Meat Institute environmental committee. He is a registered Professional Engineer in the State of Delaware.

Trabue, Steven L.

U.S. Department of Agriculture - Agriculture Research Service

Dr. Steven Trabue is a Research Chemist with U.S. Department of Agriculture (USDA) Agriculture Research Service (ARS) at the National Laboratory for Agriculture and the Environment. He holds a B.S. in Biochemistry from the University of Maryland (1985), and an M.S. (1991) and Ph.D. (1997) in Soil and Water Science from the University of Florida. Dr. Trabue's research addresses the impact that animal feeding operations (AFO) have on both local and regional air quality in intensive agricultural areas. His research includes the following areas: 1) Determining the emission and transport of ammonia, odors, particulate material (PM), and volatile organic compounds (VOC) from AFOs; and 2) Development of air sampling techniques for the speciation of amines, VOCs, volatile sulfur compounds, and PM emitted from AFOs. Prior to his employment at USDA, Dr Trabue was a Senior Research Chemist at DuPont responsible for directing a laboratory program investigating dissipation processes of agrochemicals in the environment compliant with GLP methodologies. He has extensive experience in regulatory science from registration of pesticides in the U.S. and European Union to measuring emission inventories of agricultural VOCs for California Air Resource Board and he understands the challenges and pitfalls in developing comprehensive guidelines. Currently, Dr. Trabue serves as a member in USDA ARS Animal GRACenet (Greenhouse gas Reduction through Agricultural Carbon Enhancement network) group, Secretary of EE-6 odor committee of the Air Waste Management Association (AWMA), and he is active in the Agrochemical division of American Chemical Society where he has helped to organize and host several symposiums on agricultural air quality. He is as an adjunct faculty at both Iowa State University and Kansas State University serving on student graduate committees in the Departments of Agricultural Engineering.

Wang-Li, Lingjuan

North Carolina State University

Dr. Lingjuan Wang-Li is an Associate Professor of the Department of Biological and Agricultural Engineering at North Carolina State University. She holds a Bachelor of Engineering (BE) in Cotton Engineering from Anhui Institute of Finance and Trade, China (1985), and an M.S. in Agricultural Engineering (2000) and Ph.D. in Biological and Agricultural Engineering (2004) from Texas A&M University. Dr. Wang-Li specializes in air emission/air quality monitoring, modeling, mitigation, and animal housing environmental management. Much of her research addresses various aspects of air emission problems associated with animal feeding operations (AFOs). Dr. Wang-Li's projects include monitoring and modeling air emissions from poultry operations, study of fate and transport of gaseous and particulate matter emissions from animal housing systems, and assessment of mitigation techniques for air emission controls. She also teaches an undergraduate and a graduate course in air quality, animal housing and environmental management. Dr. Wang-Li was a recipient of the U.S. National Science Foundation Career Award in Environmental Engineering in 2010. She is a member of American Society of Agricultural & Biological Engineers, Air & Waste Management Association, CIGR, and Sigma Xi, and has served on various professional research committees. Dr. Wang-Li was the Editor-in-Chief (2005-2008) of Agricultural Engineering International-the CIGR Ejournal; Chair (2007-2008) of S1025 Multi-State Air Quality Research Committee: "Systems for Controlling Air Pollutant Emissions and Indoor Environments of Poultry, Swine, and Dairy Facilities".

Warren Hicks, William J.

Cardno Entrix, Inc.

Dr. William J. Warren-Hicks is Vice President/Technical Director and Biostatistics Practice Leader at Cardno Entrix, Inc. located in Raleigh, NC. He holds a B.S. in Biology from University of Houston (1976), an M.S. in Environmental Toxicology and Statistics from the University of Texas School of Public Health (1979), and a Ph.D. in Environmental Statistics from Duke University (1990). Dr. Warren-Hicks has a total of 30 years of experience providing consulting expertise in the areas of environmental data analysis, uncertainty analysis, Bayesian inference and decision, probabilistic risk methods, survey design, time-series modeling, messy data analysis, hypothesis testing, multivariate analyses, and model validation studies. He has over 134 peer-reviewed publications, 2 books, and 8 book chapters in the areas of environmental statistics, probabilistic modeling, decision sciences, and risk assessment. Dr. Warren Hicks has twenty years expertise in evaluating the precision and accuracy of air quality emissions. The majority of this work was for U.S. EPA Office of Air and Radiation. Dr. Warren-Hicks has managed over 200 projects for clients in all major U.S. Environmental Protection Agency (EPA) programs. He teaches courses at Duke University and Elon University to both undergraduate and graduate students. These courses focus on the analysis of environmental data in risk-based decision making, including uncertainty analysis methods. Dr. Warren-Hicks is the lead instructor for New Advances in Ecological Risk Assessment, given under the Continuing Education Program at Duke University. He developed a course entitled Using Monte Carlo Analysis In The Probabilistic Risk Assessment of Pesticides, a course in uncertainty analysis methods that was given multiple times to EPA's Office of Pesticide Programs (OPP), individual chemical companies, and industry coalitions. Dr. Warren-Hicks was the lead statistician to the Federal Insecticide, Fungicide and Rodenticide Act Environmental Model Validation Task Force (FEMVTF) Statistics Committee in conducting an uncertainty analysis of the PRZM3.12 model. He has consulted on issues associated with the statistical analysis of pesticide data within a risk context for both EPA's OPP and industry. In addition, Dr. Warren-Hicks was an invited speaker and associated lead chapter author of six SETAC Pellston Conferences including Sediment Risk Assessment, Multiple Stressors (steering committee member), Probabilistic Risk Assessment of Pesticides, Whole Effluent Toxicity Testing, Potential Risks of Plant Protection Products to Pollinators, and Uncertainty Analysis In Ecological Risk Assessment (chair, lead editor, lead conference organizer, and creator).

Wheeler, Eileen Fabian**Pennsylvania State University**

Dr. Eileen Fabian Wheeler is a professor of Agricultural Engineering at Pennsylvania State University. She holds a B.S. in Agricultural Engineering from Pennsylvania State University (1980), and an M.S. in Agricultural Engineering (1985) and a Ph.D. in Agricultural & Biological Engineering (1995) from Cornell University. Dr. Wheeler has an Extension education appointment plus an integrated research program for agricultural professionals who are interested in applying engineering principles for effective indoor environment management. Her primary Extension and research focus is on Air Quality or more specifically Environmental BioPhysics within agricultural structures. Dr. Wheeler's focus of effort is for commercial agriculture when it is moved indoors. Her priority research areas include impact of environment on animal welfare and plant production; ventilation system performance of barns and greenhouse structures; and reduction of air emissions from animal feeding operations (AFO). Dr. Wheeler's additional Extension efforts have improved engineering design of horse stables and riding arenas while recent research efforts have focused on odor evaluations of intensive livestock production. She has published air quality research across a broad array of indoor-agriculture sectors including laying hen, broiler chicken, turkey, veal calf, swine, dairy, equine, greenhouse and mushroom production.

Williams, D'Ann L.**Johns Hopkins University**

Dr. D'Ann Williams is a Research Associate in the Department of Environmental Health Sciences at the Johns Hopkins Bloomberg School of Public Health. She holds a B.A. in Natural Sciences from Towson University (1995), and an M.S. in Environmental Science and Policy (2002) and Ph.D. in Environmental Health Sciences (2010) from Johns Hopkins University. For over a decade, Dr. Williams has worked as a Research Specialist in Exposure Assessment for the Center for Childhood Asthma in the Urban Environment (CCAUE) involved in investigating the environmental determinants of asthma in urban Baltimore. Her expertise extends to data collection, quality control assessment, management, analysis, and interpretation associated with CCAUE studies. In 2001, following the World Trade Center disaster, Dr. Williams studied area level airborne exposures and airborne exposures to truck drivers on and off the site through participatory research with the Teamsters Union. She also led a research team in New Orleans, post-hurricane Katrina, to evaluate water quality, in-home mold and soil contaminants. Dr. Williams has presented domestically and internationally on her dissertation work which evaluated contaminants associated with industrial scale dairy operations in Yakima Washington and their impact on regional home environments. Her research interests lie at the intersection of complex environmental measurement methods, study designs to investigate environmental health outcomes, and ultimately the translation of public health research into policy.

Wing, Steven**University of North Carolina**

Dr. Steven Wing is Associate Professor of Epidemiology at the University of North Carolina School of Public Health. He holds a B.A. in Psychology from Vassar College (1975), an M.A. in Sociology from Duke University (1980), and a Ph.D. in Epidemiology from the University of North Carolina (1983). Dr. Wing conducts research on various topics in environmental and occupational health including community health effects of industrial animal production. Since 1996 he has been principal investigator of several research grants on health impacts of air pollution from confined animal feeding operations (CAFOs). Dr. Wing's CAFO-related peer-reviewed publications include studies of symptoms and quality of life, respiratory health of school children, odor, particulate matter, endotoxin, hydrogen sulfide, mental health, lung function, and environmental justice.

Wood, C. Wesley

Auburn University

Dr. C. Wesley (Wes) Wood is a Professor of Environmental Soil Science in the Department of Agronomy and Soils at Auburn University. He also is Coordinator of Auburn University's Interdisciplinary Environmental Science major. He holds a B.S. in Agronomy (1979) and an M.S. in Soil Science from Mississippi State University, and a Ph.D. in Soil Science from Colorado State University (1990). Dr. Wood does research on carbon and nutrient cycling in managed and natural ecosystems, and has published over 110 refereed journal articles on that topic. He has published several peer reviewed research papers on his studies of ammonia and greenhouse gas emissions from land applied broiler and swine wastes. Dr. Wood has also developed and published a micrometeorological method for determining ammonia emissions from land surfaces. He teaches classes in the area of nutrient management, soils and environmental quality, general environmental science, and sustainability. Dr. Wood has conducted research in Latvia, Lithuania, Estonia, Brazil, South Africa, Kenya, Tanzania, Ecuador, Peru, Thailand, Honduras, Mexico, The Philippines, Haiti, and New Zealand. He served as Associate Editor and later as the Soil Science Technical Editor for the Agronomy Journal. Dr. Wood has won awards for his research, is a Fellow of the American Society of Agronomy, and is also a Fellow of the Soil Science Society of America.

Xin, Hongwei

Iowa State University

Dr. Hongwei Xin is a professor in the Departments of Agricultural and Biosystems Engineering and Animal Science at Iowa State University (ISU). He also serves as director of the Egg Industry Center located at ISU. He holds a B.S. in Agricultural Engineering from Shenyang Agricultural University in China (1982), and an M.S. (1985) and Ph.D. (1989) in Agricultural Engineering from University of Nebraska. Dr. Xin's graduate research dealt with impact of atmospheric ammonia on bioenergetics and physiology of laying hens (MS) and impact of different cooling regimens on bioenergetics, feeding and drinking behaviors and production performance of growing swine (Ph.D.). Following his graduate studies, he spent 3.5 years as a Post-Doctoral Research Associate at the University of Arkansas where he conducted extensive field-scale research on broiler housing, energy efficiency and air quality. In December 1993, Dr. Xin joined Agricultural and Biosystems Engineering Department at ISU as an assistant professor, and was promoted to associate professor with tenure in 1998 and to full professor in 2002. His research and extension programs has been focusing on a) air quality issues relative to animal (particularly poultry) production, with emphasis on quantification and mitigation of air emissions; b) impacts of environmental factors and management practices on animal (particularly poultry) behavior and welfare, production efficiency and sustainability; and c) housing systems and environmental control for livestock and poultry. Dr. Xin and his colleagues pioneered some of the air emissions measurement and mitigation work in the U.S., particularly with broilers, laying hens and turkeys. He has authored/co-authored more than 460 technical publications, served as PI/Co-PI of more than \$15 million in contracts and grants, and is a frequent invited speaker at national and international conferences. His major honors and awards include the American Society of Agricultural and Biological Engineers (ASABE) New Holland Young Researcher Award, 10 ASABE Paper Awards, ASABE Fellow, Iowa Poultry Industry Person of the Year Award, ISU College of Engineering David R. Boylan Eminent Faculty Research Award, ISU College of Agriculture and Life Sciences Outstanding Research Award, CALS Outstanding Achievement in International Agriculture Award, and ISU Award for Outstanding Achievements in Research. Dr. Xin has served as Chair of the United Egg Producers Environmental Scientific Panel, and a member of the U.S. Department of Agriculture (USDA) Agricultural Air Quality Task Force since 2008.

Zhao, Lingying

Ohio State University

Dr. Lingying Zhao is an Associate Professor of the Department of Food, Agricultural, and Biological Engineering at the Ohio State University. She holds a B.S. (1990) and M.S. (1987) in Bio-Environment Engineering from China Agricultural University, China, and a Ph.D. in Agricultural Engineering from University of Illinois at Urbana-Champaign (2000). Dr. Zhao conducts research, teaching, and extension programs in air quality of and emissions from agricultural facilities, building Heating, Ventilation, and Air Conditioning systems, and alternative bioenvironmental control with renewable energy. Her research projects focus on measurement, modeling, and control of air emissions from animal production facilities, effective ventilation and indoor environmental quality control systems to improve health and energy efficiency, and development of wireless environmental monitoring and control systems.

Zwicke, Greg

U.S. Department of Agriculture-Natural Resources Conservation Service

Mr. Greg Zwicke is the Air Quality Engineer on the U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Air Quality and Atmospheric Change Technology Development Team in Portland, OR. He holds a B.S. (1996) and M.S. (1998) in Agricultural Engineering from Texas A&M University. In his current position, Mr. Zwicke is the USDA-NRCS expert on air quality issues related to animal agriculture. USDA-NRCS relies on his technical expertise in this area to develop Agency policy related to air quality and animal agriculture. Mr. Zwicke has responsibility for incorporating current knowledge related to air emissions from animal operations into Agency guidance and tools, as well as developing and providing nationwide Agency training for air quality and animal agriculture issues. He has considerable experience with air quality regulations, site-specific emissions inventory development, air quality dispersion modeling, and mitigation of emissions from agriculture. Mr. Zwicke has served on informal Interagency panels and workgroups related to agricultural air quality, and routinely serves as a USDA-NRCS representative on stakeholder advisory groups for air quality research projects related to animal agriculture.