

**Invitation for Public Comment on the List of Candidates for the
EPA Science Advisory Board (SAB)
Mercury Review Panel
April 15, 2011**

The U.S. Environmental Protection Agency (EPA) Science Advisory Board (SAB) Staff Office published a Federal Register Notice on February 28, 2011 (76 FR 10896–10897) requesting public nominations to serve on a Clean Air Scientific Advisory Committee (CASAC) to peer review EPA's draft risk assessment for mercury, entitled *Technical Support Document: National-Scale Mercury Risk Assessment Supporting the Appropriate and Necessary Finding for Coal and Oil- Fired Electric Generating Units*. In a subsequent notice published on March 30, 2011 (76 FR 17649-17650), the SAB Staff Office extended the comment period for one week. In that second notice, the SAB Staff Office announced that the SAB, rather than CASAC, will conduct the review and that the new panel will be formed under the authority of the SAB.. The March 30, 2011 notice stated that nominations of experts in response to the February 28, 2011 Federal Register Notice would be considered for the new SAB panel.

In both Federal Register notices the SAB Staff Office sought public seeking nominations of nationally and internationally recognized experts with experience and expertise in the following disciplines, particularly related to mercury: atmospheric fate, transport and modeling; aquatic fate, transport and modeling; bioaccumulation; human exposure; epidemiology; toxicology, including reproductive and neurotoxicology, biostatistics, and risk assessment.

The SAB Staff Office has identified 40 candidates based on their relevant expertise and willingness to serve. The SAB Staff Office Director will make the final decision about who will serve on the Panel based on all relevant information. This will include a review of the confidential financial disclosure form (EPA Form 3110-48), relevant information gathered by staff, and public comments. For the 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 advisory committees and panels; and f) for the panel as a whole, diversity of scientific expertise and viewpoints.

We hereby invite comments on the attached List of Candidates for consideration by the SAB Staff Office in the formation of this Panel. Comments should be submitted to Dr. Angela Nugent, Designated Federal Officer, no later than May 5, 2011. E-mailing comments (nugent.angela@epa.gov) is the preferred mode of receipt. Please be advised that comments are subject to release under the Freedom of Information Act.

List of Candidates for the EPA Science Advisory Board (SAB) Mercury Review Panel

Allen, David T.

University of Texas

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 six books and over 190 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.

Brigham, Mark

U.S. Geological Survey

Since May 2001, Mr. Mark Brigham has been coordinator for the Mercury in Stream Ecosystems studies that are conducted as part of the U.S. Geological Survey's National Water-Quality Assessment (NAWQA) Program. He is responsible for the overall management of the project, including coordinating a diverse range of scientists (hydrologists, geochemists, ecologists, geographers). He has conducted detailed investigations of mercury cycling and bioaccumulation in streams of Oregon, Wisconsin, Florida, New York, and South Carolina; and a national survey of mercury in streams across the U.S. He received a Bachelor's in Chemistry (1988) and a Master's in Civil Engineering (1992), both from the University of Minnesota. His Master's thesis research examined historical patterns of mercury deposition using lake sediment cores, and other aspects of aquatic mercury cycling. He was hired by the USGS in 1991, and worked for several years on a large NAWQA project assessing water quality in the Red River of the North Basin, focusing largely on agricultural water-quality issues. He then shifted back to mercury, working on a number of studies of mercury in impoundments, wetlands, lakes, and rivers in Minnesota before accepting his current position. His research interests are the occurrence, distribution, and cycling of contaminants in aquatic ecosystems. Most of his career, from graduate school to the present, has focused on mercury in freshwater ecosystems (lakes, streams, impoundments, and wetlands). He focuses largely on environmental / landscape factors that control mercury speciation and transport to

aquatic ecosystems; relations of mercury geochemistry to hydrologic, chemical, and physical features of aquatic ecosystems; and, working with collaborating ecologists, to improve understanding of the physical and chemical controls on methylmercury bioaccumulation. He also collaborates on an effort to compile and analyze fish-mercury data from numerous State and Federal monitoring programs. He participated in the "MercNet—Establishing a Comprehensive National Mercury Monitoring Network" workshop in Annapolis Maryland, May 5-7, 2008 (<http://nadp.sws.uiuc.edu/mercnet/MercNetFinalReport.pdf>), and co-chaired the Water and Watersheds workgroup for an ongoing assessment of mercury in the Great Lakes region (http://www.briloon.org/about/staff/GLAD_2010/GLC%20final%20report%20073010.pdf). He belongs to the American Chemical Society (Environmental Chemistry division); American Geophysical Union; and American Society of Limnology and Oceanography.

Burbacher, Thomas

University of Washington

Dr. Thomas Burbacher is Professor of Environmental and Occupational Health Sciences at the University of Washington (UW) where he teaches classes in basic Environmental and Occupational Health and Children's Environmental Health. He is also the Deputy Director of the UW Pacific Northwest Center for the National Children's Study and the Center for Children's Environmental Health Risk Research. In addition, Dr. Burbacher is the Head of the Division of Reproductive and Developmental Sciences and Director of the Infant Primate Research Center at the UW National Primate Research Center and the Center on Human Development and Disability (CHDD). He is also the Head of the Developmental Toxicology Research Emphasis Area at the CHDD and is Director of the Research Translation Core for the UW Superfund Research Program. Dr. Burbacher holds a B.S. in Psychology from the University of Cincinnati and a Ph.D. in Psychology from the University of Washington. His postdoctoral work included research in Developmental Toxicology in the Environmental Pathology Training Program at the UW. Dr. Burbacher's research investigates changes in brain development and function caused by prenatal exposure to neuroactive substances. He has conducted research in the area of mercury developmental neurotoxicity utilizing nonhuman primate models for several decades and was a member of the National Academy of Sciences panel that developed the report on the "Toxicological Effects of Methylmercury." His research reaches across species, including studies with human populations and a variety of animal models, to enhance a fundamental understanding of toxicants and their role in biological and behavioral development. Examples of such research include the following: (1) On-going studies in human populations designed to examine the effects of early domoic acid exposure on motor and cognitive development in Native American populations; (2) Activities of the National Children's Study sites in Washington and Oregon that are studying the effects of the environment on the health and behavioral development of American children from birth to 21 years of age; (3) Experimental approaches in rodent models that include studies of the interaction between genetics and environmental exposures and (4) Landmark studies in developmental neurotoxicology using the nonhuman primate model at the Infant Primate Research Laboratory to study compounds such as methylmercury, thimerosal, alcohol and methanol. Data from Dr. Burbacher's research program are used to help formulate policies aimed at the protection of human populations from levels of exposure to environmental contaminants such as methylmercury and methanol that are associated with adverse health effects and developmental disabilities.

Burch, James**University of South Carolina**

Dr. James Burch is an Assistant Professor in the Department of Epidemiology and Biostatistics at the Arnold School of Public Health at the University of South Carolina (USC), and he also has a dual appointment as a Health Research Specialist at the Dorn Veterans Affairs (VA) Medical Center in Columbia, SC. Dr. Burch received his PhD degree in Environmental Health with a specialization in Epidemiology from Colorado State University and his MS degree in Pharmaceutical Sciences from the University of Colorado. He has broad research and professional experience in the Environmental Health Sciences and in Environmental, Occupational, and Molecular Epidemiology. Dr. Burch recently completed a statewide study examining the relationship between sport fish methylmercury (MeHg) concentrations and adverse reproductive outcomes in South Carolina (SC). A geographic information system (GIS) was used to integrate ten years of fish MeHg biomonitoring data with 362,580 birth certificates from the SC Vital Statistics Registry (1995 - 2005). Generalized estimating equations were used to test the hypothesis that risk of low birth weight (LBW,

Carpenter, Hillary**Minnesota Department of Health**

Dr. Hillary Carpenter is a senior Toxicologist with the Health Risk Assessment unit in the Division of Environmental Health of the Minnesota Department of Health. He earned his Ph.D. at Dartmouth Medical School and has 32 years of experience working as a toxicologist, first as an academic at Oregon State University, and for the last 15 years as a research scientist at MDH dealing with environmental public health science issues. He is an adjunct faculty member of the University of Minnesota's School of Public Health and a member of the graduate faculty in toxicology. He is former member of the National Toxicology Program's Board of Scientific Counselors and recently completed a term as a member of the National Advisory Environmental Health Sciences Council. He is a member of the Society of Toxicology and past-president of the Northland Regional Chapter of the Society of Toxicology. Dr. Carpenter's current duties include: developing health based values for environmental contaminants such as pesticides and metals; providing toxicological support for the Minnesota Fish Consumption Advisory Program, and for the Health Department on such issues as endocrine disrupters and deformed frogs; and conducting risk assessments as requested by other state agencies. His experience in both basic toxicology research and applied environmental health sciences will allow him to provide the Mercury Review Panel with a public health perspective on mercury issues.

Chen, Celia**Dartmouth College**

Dr. Celia Chen is a Research Associate Professor in the Department of Biological Sciences at Dartmouth College. She has also been a lead scientist for 16 years in the Dartmouth Toxic Metals Superfund Research Program. She received her BA in Biology and Environmental Studies at Dartmouth College (Hanover, NH) and an MS in Biological Oceanography at the Graduate School of Oceanography of the University of Rhode Island (Narragansett, RI) and a Ph.D. in Ecology from Dartmouth College. After finishing her Ph.D., she became a lead scientist in the Superfund Research Program. She has studied the fate and effects of metal contaminants in freshwater and estuarine ecosystems including the bioaccumulation and trophic transfer of mercury in lakes

throughout the Northeast US including Lake Champlain. Her more recent metals research has investigated metal bioavailability and bioaccumulation in coastal marsh food webs from Maine down to NJ. She has also conducted research on developing genomic tools as biomarkers of metal exposure for the model organisms, *Daphnia pulex* and *Fundulus heteroclitus*. She has investigated the effects of multiple stressors on aquatic organisms by developing methods for quantifying the antagonistic, synergistic, and additive effects of stressors such as organic contaminants, pH, food availability, and temperature. Dr. Chen has also studied the impact of environment changes due to climate change including effects of warming on demography and phenology of aquatic invertebrates and she was a contributor to the 1995 IPCC Report on Climate Change. She served on the Hubbard Brook Research Foundation Science Links Panel on mercury in the environment and has chaired regional and international workshops on mercury in marine ecosystems. She is currently a Review Editor for the journal *Ecohealth* and serves on the Scientific Advisory Committee of the Lake Sunapee Protection Association and on the Scientific Council of Biodiversity Research Institute.

Cohen, Joshua

Tufts New England Medical Center

Dr. Joshua T. Cohen is a Research Associate Professor of Medicine at the Tufts Medical Center Institute for Clinical Research and Health Policy Studies, and Deputy Director of the Center for the Evaluation of Value and Risk in Health. His research focuses on the application of decision analytic techniques to public health risk management problems with an emphasis on quantifying the risks, benefits, and costs of public health interventions. Past work has involved evaluations of measures to alter population fish consumption, the use of cell phones while driving, and alternative propulsion technologies for transit buses. Dr. Cohen's most recent work has involved evaluations of the cost-saving potential of preventive health measures, potential gains from reallocating Medicare spending, and cardiac risk screening strategies for children who are candidates for stimulant medications to treat attention-deficit hyperactivity disorder (ADHD). Dr. Cohen has served on several National Academy of Sciences committees, most recently to evaluate US EPA's methodology for estimating environmental health risks, and on the Massachusetts Department of Education panel that guided revisions to the state's elementary and secondary school math curriculum framework. He also served as a member of the National Academies of Sciences Committee on EPA's Exposure and Human Health Reassessment of TCDD and Related Compounds (dioxin). Dr. Cohen received both his Ph.D. in Decision Sciences and his B.A. in Applied Mathematics from Harvard University.

Cory-Slechta, Deborah

University of Rochester

Dr. Deborah Cory-Slechta received her Ph.D. degree from the University of Minnesota in 1977 and worked as a junior staff fellow of the National Center for Toxicological Research beginning in 1979. She was appointed to the faculty of the University of Rochester Medical School in 1982 was appointed Chair of the Department of Environmental Medicine and Director of the NIEHS Environmental Health Sciences Center at the University of Rochester in 1998. From July 2000- July 2002, she was the Dean for Research and Director of the AAB Institute for Biomedical Sciences, a newly established post at the University and as such, became the first female dean in the history of the Medical School. From 2003-2007 she served as Director of the Environmental and

Occupational Health Sciences Institute (UMDNJ/Rutgers) and Chair of the Department of Environmental and Occupational Medicine at the Robert Wood Johnson Medical School (UMDNJ). In 2007, she returned to the Department of Environmental Medicine at the University of Rochester School of Medicine where she serves as Professor. Her research has focused largely on environmental neurotoxicants as risk factors for behavioral disorders and neurodegenerative disease. Currently she has also begun to examine mixtures of neurotoxic chemicals and risk modifiers for effects of neurotoxicants, including factors such as stress and those related to low socioeconomic status as well. These research efforts have resulted in over 120 papers and book chapters to date. Dr. Cory-Slechta has served on numerous national research review and advisory panels, including committees of the National Institutes of Health, the National Institute of Environmental Health Sciences, the Food and Drug Administration, the National Center for Toxicological Research, the Environmental Protection Agency, the National Academy of Sciences, the Institute of Medicine, and the Agency for Toxic Substances and Disease Registry, Centers for Disease Control. In addition, Dr. Cory-Slechta has served on the editorial boards of several journals including Neurotoxicology, Toxicology, Toxicological Sciences, Fundamental and Applied Toxicology, Neurotoxicology and Teratology, and American Journal of Mental Retardation. She has held the elected positions of President of the Neurotoxicology Specialty Section of the Society of Toxicology, President of the Behavioral Toxicology Society, and been named a Fellow of the American Psychological Association.

Diamond, Miriam L.

University of Toronto

Dr. Miriam L. Diamond is Professor at the University of Toronto in the Department of Geography and Program in Planning with cross-appointments to the Department of Chemical Engineering and Applied Chemistry and the Dalla Lana School of Public Health. She received her B.Sc. in Biology from the University of Toronto, M.Sc. from the University of Alberta in Zoology, M.Sc. Eng from Queen's University (Kingston Ontario) in Mining Engineering, and her Ph.D. in environmental engineering from University of Toronto. After one year as a post-doctoral fellow at the Institute for Environmental Studies at the University of Toronto, she joined the University's faculty. Her research focuses on understanding the sources, emissions, fate and exposure from and to chemical contaminants in natural and human environments. This research has included assessments of contaminants vis-a-vis the Great Lakes and Remedial Action Plans for several Areas of Concern in the lakes. Dr. Diamond is a member of the Science Advisory Board of the International Joint Commission of Canada and currently sits on National Academies of Sciences Institute of Medicine panel reviewing the exposure of Blue Water Navy Vietnam Veterans to Agent Orange. She is a member of the Editorial Advisory Board for the journal Environmental Science and Technology and a member of the Board of Directors of the Canadian Environmental Law Association. She is a Fellow of the Canadian Geographical Society and was named Canadian Environmental Scientist of the Year in 2007 by that society.

Driscoll, Jr., Charles T.

Syracuse University

Dr. Charles T. Driscoll is the University Professor of Environmental Systems Engineering at Syracuse University. Dr. Driscoll received his B.S. degree in Civil Engineering from the University of Maine in 1974, and his M.S. in 1976 and Ph.D. in 1980 in Environmental Engineering from Cornell

University. Dr. Driscoll's teaching and research interests are in the areas of environmental engineering, environmental chemistry, biogeochemistry and environmental quality modeling. A principal focus of Dr. Driscoll's research has been the effects of disturbance on forest, aquatic and coastal ecosystems, including air pollution (acid rain, mercury), land-use change and elevated inputs of nutrients and trace metals. Dr. Driscoll uses a variety of research approaches to study these perturbations, including field investigations, laboratory studies, long-term field measurements, whole-ecosystem manipulations, and the development and application of models. Dr. Driscoll has authored or co-authored more than 300 peer-reviewed articles and has been acknowledged by the Institute for Scientific Information (ISI) as one of the most highly cited researchers in both engineering and environmental science. He is currently the principal investigator of the National Science Foundation's Long-Term Ecological Research project at the Hubbard Brook Experimental Forest, New Hampshire. In 1984, the National Science Foundation designated Dr. Driscoll as a Presidential Young Investigator. He has provided expert testimony to U.S. Congressional and State committees. Dr. Driscoll has served on many local, national and international committees, including the National Research Council Panel on Process of Lake Acidification, the Committee of Air Quality Management, and the Committee on CLEANER and NSF's Environmental Observations and the Committee Reviewing Everglades Restoration.

Evans, John

Harvard University

Dr. John Evans is Senior Lecturer in Environmental Science at Harvard School of Public Health, where he serves as co-director of the Program in Environmental Science and Risk Management. He holds a B.S.E. (Industrial Engineering) and a M.S. (Water Resources Management) from the University of Michigan and earned his S.M. and Sc.D. in Environmental Health Sciences at Harvard. Dr. Evans has worked in the field of risk analysis for over twenty years and has emphasized the importance of characterizing uncertainty in estimates of health risks in his research. He has experience in uncertainty analysis and has conducted several studies using formally elicited expert judgment to describe uncertainty in environmental health risks. His recent work has examined the role of decision and value of information analysis in setting priorities for environmental research. Dr. Evans has been a member of the Society for Risk Analysis since it was founded; has served as the Chair of the New England Chapter, and as both a member of the Editorial Board of the SRA's journal Risk Analysis and as an area editor of Risk Analysis. He was a member of the NAS Committee on Estimating the Health Benefits of Air Pollution Regulations and also served on the EPA Science Advisory Board (Drinking Water Committee).

Henke, Kevin

University of Kentucky

Dr. Kevin Henke has investigated mercury contamination issues in soils, water and related issues for about 20 years. He received a Ph.D. in 1997 from the University of North Dakota. His dissertation research evaluated the effectiveness of a couple of commercial products for chemically precipitating mercury and other heavy metals from water. This research included thoroughly investigating the chemistry of the commercial products and the mercury precipitates. He did a lot of my dissertation research under Dr. Ralph Turner at Oak Ridge National Laboratory, 1994-1996. While at Oak Ridge, He also investigated the elemental mercury spills in the soils and water in the basement of one of the buildings at the Y-12 facility. Elemental mercury had been used in the

manufacturing of nuclear weapons. In the process, a lot of mercury was spilled and accumulated in the dirt basement floor. Prior to his dissertation research, he wrote and edited a summary report for the Gas Research Institute on mercury contamination from natural gas pipeline manometers. At that time, the Gas Research Institute was interested in a critical summary report on the chemical and physical properties of elemental mercury, health and safety issues and technologies for remediating the element from soils and water.

Holsen, Thomas

Clarkson University

Dr. Thomas M. Holsen is currently a professor in Civil and Environmental Engineering at Clarkson University and associate director of Clarkson's Center for Air Resources Engineering and Science. He obtained a PhD degree from the University of California at Berkeley in Civil and Environmental Engineering in 1988. His primary research interests include the transport, transformations and fate of pollutants in environmental systems. Recently he has been investigating the atmospheric concentrations, sources, deposition and emissions of mercury in the Adirondack Mountains, concentrations of legacy and emerging persistent organic chemicals and mercury in the Great Lakes, and investigating the transport, deposition and sources of pollutants in New York State. He was a reviewer of several congressionally mandated reports on the importance of atmospheric deposition to the Great Waters, was a member of the EPA Science Advisory Board Surface Impoundments Committee, and recently testified at Congressional and EPA briefings on Mercury regulations and their impact. He has published extensively on the absolute and relative importance of atmospheric deposition of toxic substances in and their cycling within several large ecosystems. He regularly teaches a graduate course on the transport of pollutants in the environment. He has over 110 publications and has successfully supervised research projects from industrial sources and State and Federal Agencies

Hurley, James

Wisconsin State Laboratory of Hygiene

Dr. James P. Hurley is Director of the Environmental Health Division at the Wisconsin State Laboratory of Hygiene (WSLH) and Associate Professor in the Department of Civil and Environmental Engineering at the University of Wisconsin-Madison. The WSLH provides clinical, water and other environmental and industrial hygiene analytical services, specialized public health procedures, reference testing, training, technical assistance and consultation for private and public health agencies. It serves as the main analytical laboratory for the Wisconsin Department of Natural Resources and Wisconsin Department of Health Services. His appointment with UW-Madison is through the Environmental Chemistry and Technology Program where he teaches and directs research in environmental trace metal cycling. Prior to his recent position, he served as Assistant Director for Research and Outreach for the University of Wisconsin's Sea Grant and Water Resources Institutes. Dr. Hurley has been active in mercury research projects for over 22 years conducting research projects on Wisconsin lakes and rivers, the Great Lakes, the Florida Everglades and at the Experimental Lakes Area in Canada. He is author of 66 peer reviewed journal articles and book chapters. Hurley served on the U.S. EPA Science Advisory Board for the first Mercury Study Report to Congress in 1977. He was co-chair of the Eighth International Conference on Mercury as a Global Pollutant, held in Madison, Wisconsin in August 2006 where he helped assemble an expert panel of more than 40 worldwide mercury experts that formulated

"state of the science" publications. That process led to the synthesis for the Madison Declaration on Mercury Pollution, a consensus document that was ratified by the 1,100 conference participants. He currently serves on the United Nations Industrial Development Organization, Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection in their formulation of the report "Mercury in the Marine Environment."

Klan, Mark

Private Consultant

Dr. Mark Klan is a Consulting Toxicologist in private practice, 1995 to present. He has over 20 years of experience in the field of Toxicology, with hundreds of risk assessments and toxicology evaluations conducted in nearly every state and internationally. Evaluations performed on a wide range of chemicals and exposures, particularly focused on regulatory compliance, air toxics, litigation support, brownfields redevelopment and real estate transactions. His experience includes being the Toxicology and Risk Assessment Team Leader, ABB Env. Services, Portland, ME, 1992-1995; Senior Toxicologist, AMOCO, Chicago, IL, 1989-1992; and, Fellow, Integrated Toxicology Program, Duke University, Durham, NC, 1987-1989; His education is comprised of a Ph.D., Pharmacology and Toxicology, University of Louisville, University Fellowship in Toxicology, Louisville, KY, 1987 and a B.A., Chemistry and Biology, cum laude, Presidential Scholarship, Bellarmine College, 1982

Korrick, Susan

Harvard Medical School

Dr. Susan Korrick is an Environmental Epidemiologist with particular expertise in studies of the relation of exposure to environmental chemicals (from multiple sources) with cognitive and behavioral function and with reproductive health and development. She is an Assistant Professor of Medicine at the Channing Laboratory, Harvard Medical School, and Assistant Professor in the Department of Environmental Health at the Harvard School of Public Health, Boston, MA. In addition, she is a physician with specialty training in Environmental and Occupational Medicine and an Associate Physician in the Department of Medicine at Brigham and Women's Hospital, Boston, MA. Dr. Korrick holds a B.A. from Harvard University, an M.D. from Yale University School of Medicine, and an M.P.H. from Harvard University School of Public Health. She is responsible for the training and supervision of doctoral students and post-doctoral trainees in environmental and occupational epidemiology and taught for many years as an invited lecturer in public health graduate courses in toxicology and environmental and occupational epidemiology. Her research spans studies of the toxicities of a range of environmental contaminants including metals (lead, mercury, manganese, and arsenic), organochlorine pesticides, PCBs, and dioxins among populations ranging in age from newborns to elderly adults. Dr. Korrick has been an invited speaker and/or expert panelist on a number of panels important to environmental health. She has been an invited expert panelist in several Centers for Disease Control (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) workshops concerning prenatal chemical exposure hazards and an invited speaker at various National Institutes of Environmental Health Sciences (NIEHS) and U.S. Environmental Protection Agency (EPA)-sponsored forums. Dr. Korrick has been asked to participate in special emphasis NIH peer review panels. Over the past year, she served on an Institute of Medicine, National Academy of Sciences panel assessing an ATSDR report on contaminants in the Great Lakes. This past year, Dr. Korrick served as an ad hoc member of the

EPA SAB Environmental Engineering Committee (EEC) Panel that provided advice to EPA on its draft Hydraulic Fracturing Research Scoping Study Plan.

Krabbenhoft, David

U.S. Geological Survey

Dr. David Krabbenhoft his B.S. degree from North Dakota St. University (Geology) in 1982, and M.S. and Ph.D. degrees from the University of Wisconsin-Madison (Geochemistry and Hydrogeology) in 1984 1988, respectively. After completing his graduate training, Dave was hired by the U.S. Geological Survey as a research scientist with the Wisconsin Water Science Center, and has been located there since. He has general research interests are in biogeochemistry and hydrogeology of aquatic ecosystems. He began working on environmental mercury cycling, transformations, and fluxes in aquatic ecosystems with the Mercury in Temperate Lakes project in 1988, a project that helped to transform our understanding of the sources, cycling and pathways of mercury in the environment. Since 1988, environmental mercury research has consumed his professional life. In 1994, Dr. Krabbenhoft established the USGS's Mercury Research Laboratory, which includes a team of multi-disciplinary mercury investigators and a state-of-the-art analytical facility strictly dedicated to low-level speciation analysis of mercury. In addition, his research team maintains and operates USGS Mobile Atmospheric Mercury Lab, which has the capability for rapid deployment and advanced study of atmospheric mercury and air chemistry. In 1995 he initiated the multi-agency Aquatic Cycling of Mercury in the Everglades (ACME) project, which is still ongoing. More recently, he has been a Primary Investigator on the internationally conducted Mercury Experiment to Assess Atmospheric Loadings in Canada and the US (METAALICUS) project, which is a novel effort to examine the ecosystem-level response to loading an entire watershed with mercury. Currently, Dr. Krabbenhoft's research team is active on projects that span environments as far ranging as the Pacific Ocean to freshwater systems in Alaska to Florida, and from California to New England. Research topics conducted by his team are wide ranging, including: atmospheric mercury source assessments; cycling and fluxes of mercury in aquatic and terrestrial ecosystems; chemical controls on the bioavailability of mercury to methylating microbes in pure culture; and most recently developing a large-scale (continental) understanding of mercury and methylmercury in freshwater systems across the US, as well as several of the world's ocean basins. Since 1990, he has authored or coauthored over 100 papers on mercury in the environment. Throughout his career, Dr. Krabbenhoft has served on a number of science planning and advisory committees within and outside the USGS. Recent or current science committees include: USGS Science Planning Team (10-year plan) for Environmental Health (2010 to present); Oak Ridge National Lab Science Focus Area Advisory Committee (2010 to present); San Francisco Estuary Institute Science Advisory Panel (2010 to present); Working Group member for the internationally conducted Task Force on Hemispheric Transport of Air Pollution (HTAP) (2009 to present); US Representative (request from DOI) to Arctic Monitoring and Assessment Program (AMAP) Strategic Planning Group (2009-10); Steering Committee for the Tenth International Conference (July 2011) on Mercury as a Global Pollutant; Co-Host Scientist, Eighth International Conference (August 2006) on Mercury as a Global Pollutant; Committee Member, Interagency Working Group (IWG) on Methylmercury, White House Office of Science, Technology and Policy (OSTP), June 2002 to October 2004; USGS Mercury Research Team Leader, 1994 to present. Sources of funding for his research program currently include: USGS Toxics Substances

Hydrology program; USGS Priority Ecosystems Studies program; and the Great Lakes Restoration Initiative.

Levin, Leonard

Electric Power Research Institute

Dr. Leonard Levin is a Technical Executive in the Environment Sector at the Electric Power Research Institute, Palo Alto, California. Dr. Levin received his education at the Massachusetts Institute of Technology, the University of Washington, and the University of Maryland. He is currently affiliated as a research associate with Harvard University, School of Engineering and Applied Sciences. Dr. Levin specializes in atmospheric circulation and turbulence, from global cycling to atmospheric microlayers. His work focuses on global cycling, sources, and removal of persistent toxicants such as mercury, and on large-scale human exposure via biogeochemical cycling. He has published more than 50 articles in scientific journals, served as organizer, co-organizer, or steering committee member on approximately two dozen international scientific conferences on mercury, air quality issues, human health risk assessment, and computer simulations of fluid flow. Dr. Levin has served as an academic advisor in various capacities at the University of California at Berkeley and Harvard University. He has provided technical briefings on the state of science concerning mercury and air toxics twice to the United States Senate, as well as to the U.S. House of Representatives, the U.S. Office of Management and Budget, and the U.S. Department of State. He is a representative to the United Nations Workgroup on Mercury Fate and Transport, and a delegate to the U.N. capacity-building workshop on mercury for Southeast Asia. His research and research projects have been cited by the U.S. Environmental Protection Agency and in the National Research Council Report "Science and Judgment in Risk Assessment."

Lin, C. Jerry

Lamar University

Dr. C. Jerry Lin received his Ph.D. degree in Environmental Engineering from the University of Cincinnati in 1998 (Dissertation: chemical transformations of mercury in the atmosphere). He is currently a Professor in the Department of Civil Engineering at Lamar University. Dr. Lin is an important contributor to the current understanding of mercury chemistry and has been involved in the experimental and modeling investigations for atmospheric mercury for more than 15 years. As a PI/Co-PI for 50+ projects funded by federal and state agencies (NSF, EPA, USDA, DoD and TCEQ), his research activities also include the atmospheric processes of criteria air pollutants, comprehensive air quality modeling, global change, and water/wastewater engineering. Dr. Lin has authored and co-authored over 100 publications in the chemistry, fate and transport of atmospheric mercury. His published works have been cited more than 800 times in peer-reviewed literature. Dr. Lin has given 37 invited seminars (1 keynote presentation on mercury fate and transport), and is one of the leading authors on the long-range transport of mercury in the 2010 assessment report of the UNECE's (United Nations Economic Commission for Europe) Task Force on Hemispheric Transport of Air Pollutants (TFHTAP). He received a number of research and teaching awards, including Lamar University Scholar award and Chi-Epsilon James M. Robbins Excellence in Teaching Award. He is also a reviewer for 16 international peer-review journals and a member of in several technical review panels for NSF, USEPA and TCEQ.

Marien,Koenraad**Washington State Department of Health**

Dr. Koenraad Marien holds the position of Senior Toxicologist for the Washington State Department of Health. In this capacity, his primary responsibility is to the residents of Washington State and his mission is to assess public health concerns involving environmental contaminants so as to meet the needs of the state's residents. As with so many in the public health arena, he strives to improve public health through research efforts and by developing and advocating for approaches that minimize or eliminate exposures that may otherwise result in deleterious outcomes. During his tenure with the Department of Health, he has had the opportunity to work on a myriad of issues that span from air contaminants, to chemical warfare agents, to oil spills, shellfish toxins and pesticides. Currently, he is continuing to publish research results from a recent endeavor that investigated methyl-mercury exposure and toxicokinetics within two high fish consuming populations (Japanese and Koreans in WA). His educational background is rooted in physics, math and chemistry. He moved towards public health as he applied his learned skills in the health physics arena by developing a radon sampler and in the field of molecular toxicology by investigating how direct acting carcinogens affected replication. As a post-doctoral fellow, his personal need to apply what I learned to more directly impact public health became apparent, leading him to focus my efforts by working within a public health agency. Although his position does not easily lend itself to frequently participating on advisory committees at the national level, he has managed at times to be involved. This past year alone, he was able to participate on two panels: as a reviewer for the Science To Achieve Results grant applications supported by the US EPA National Center for Environmental Research; and as a member of a panel convened by the US EPA and tasked to review the current science on the cardiovascular impacts of mercury exposure.

Michaud,David**Electric Power Research Institute**

Mr. David T. Michaud is a Principal Environmental Scientist and a member of the Corporate Environmental Strategy Team for Wisconsin Energy Corporation, which is headquartered in Milwaukee Wisconsin. The team is largely responsible for monitoring environmental issues, participating in the development of environmental regulations and legislation, and assisting operating departments with special compliance and permitting tasks. Mr. Michaud's current tasks include fish protection strategies for hydroelectric plants, as well as hazardous air pollutant assessment and control, and fine particulate matter characterization. Mr. Michaud received his B.S. and M.S. degrees in Biology from Marquette University. His graduate research was focused on the physiological effects of mercury on fish physiology. He currently serves as chair of EPRI's Air Quality, Health and Risk Assessment Business area's Advisory Committee and is co-chair of UARG's Hazardous Air Pollutant Committee. He also serves as a member of the University of Wisconsin Sea Grant Advisory Council. Not a recent grant/contract recipient.

Milford,Jana**University of Colorado**

Dr. Jana Milford is a Professor in the Department of Mechanical Engineering at the University of Colorado at Boulder. She has previously worked as a Congressional Fellow, an Analyst at the Congressional Office of Technology Assessment, an Assistant Professor in the Department of Civil

Engineering at the University of Connecticut, and a Senior Scientist and Staff Attorney at Environmental Defense. Dr. Milford holds a B.S. in Engineering Science from Iowa State University, a M.S. in Civil Engineering from Carnegie Mellon University, a Ph.D. in Engineering and Public Policy from Carnegie Mellon University, and a J.D. from the University of Colorado, School of Law. Dr. Milford's research interests focus on photochemical air quality modeling, air pollution receptor modeling, sensitivity and uncertainty analysis of environmental models, and air quality management. She is co-author, with Anu Ramaswami and Mitchell Small, of *Integrated Environmental Modeling: Pollutant Transport, Fate, and Risk in the Environment* (John Wiley and Sons, 2005). She has served on the Colorado Air Quality Control Commission, the National Research Council Committee on Air Quality Management in the United States, and the National Research Council Committee on Energy Futures and Air Pollution in Urban China and the United States. She has also served as a consultant to the Science Advisory Board's National Air Toxics Assessment Subcommittee, Environmental Models Subcommittee, Radiation Advisory Committee, and Air Toxics Monitoring Strategy Subcommittee.

Morris, Ralph

Environ International Corporation

Mr. Ralph E. Morris is a Principal at ENVIRON International Corporation where he directs air quality modeling and analysis, control strategy development and evaluation, and regulatory air issues projects. He has over 20 years experience in air quality issues, with particular emphasis in the development and application of advanced air quality models and the development of air quality control plans. He has directed or was one of the key developers of many of the photochemical grid models that have been used to develop ozone attainment State Implementation Plans (SIPs) in the U.S. including the UAM, UAM-V, and CAMx. He has BA and MA degrees in mathematics from the University of California and has been an air quality consultant since 1979. At ENVIRON Mr. Morris' contract support comes from EPA and other federal agencies, state agencies, local agencies, trade organizations, and industry. Mr. Morris has been instrumental to bringing state-of-the-art air quality modeling techniques to regulatory air quality planning including demonstrating the use of photochemical grid models for ozone SIP modeling in the 1980's as leader of the EPA Five Cities UAM Study. Since then he has led the development of the next generation of nested-grid photochemical models (e.g., UAM-V and CAMx) and is currently leading the development of a state-of-science PMCAMx model that merges research-grade PM modules from academia (CMU and CalTech) with the CAMx platform. Mr. Morris has led or been involved in the development of ozone State Implementation Plans (SIPs) for numerous areas including: Los Angeles and San Francisco, CA; Houston/Galveston, Dallas-Fort Worth, and East Texas; Lake Michigan region; and St. Louis, MO. He has also led or been involved in the modeling of several PM SIPs, including: Los Angeles, Imperial County, and Owens Lake, CA; Rogue Valley OR; and Boise ID. Mr. Morris is currently assisting the Western Regional Air Partnership (WRAP) performing regional fine particulate and visibility modeling using the CMAQ and REMSAD models as part of the WRAP Regional Modeling Center (RMC). Mr. Morris was an original member of EPA's ozone guidance workgroup and is currently a member of EPA's fine particulate guidance workgroup. He is also currently a member of the CMAS Models-3/CMAQ External Advisory Committee (EAC) and is also a member of the Scientific, Technical, and Modeling Peer-Review Group (SMTPRAG) for the South Coast Air Quality Management District (SCAQMD).

Mushak,Paul

PB Associates

Dr. Paul Mushak is a toxicologist and human health risk assessor, working as a partner in PB Associates, a consulting practice in Durham, N.C. He is also a visiting professor, Albert Einstein College of Medicine, Bronx, NY. Earlier, he was a faculty member from 1971 to 1993 at the University of North Carolina – Chapel Hill School of Medicine, Pathology Department. He works in the area of contaminant/toxic metals, metalloids and organometals/ His doctoral (University of Florida, Gainesville) and postdoctoral (Yale University Department of Molecular Biophysics and Biochemistry) training was in the areas of metal chemistry, biochemistry, enzymology and toxicology. He has more than 40 years of widely published research and advisory expertise in the areas of exposures and their determinants, analytical pediatric toxicology, toxicokinetics, modeling and health risk assessments. He is the author or co-author of more than 175 research papers, book chapters, proceedings papers, and abstracts, a number on mercury. He has served on numerous peer advisory committees of Federal (Environmental Protection Agency, Department of Justice, Consumer Product Safety Commission, Occupational Safety and Health Administration, Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry), state, international (World Health Organization, Health Canada, Ontario Ministry of Environment) and National Academy of Sciences/National Research Council bodies. He chaired several U.S. Environmental Protection Agency review panels for reports to Congress (1995-1996): an EPA ad hoc review panel on Hg and other HAPs mandated by the 1990 CAA Amendments, and EPA ad hoc peer review panel for a report on mercury itself, mandated by Congress. The HAPs panel addressed emissions from fossil fuel fired power plants. International advisory work on mercury and other metals included membership and rapporteurship for two WHO-Europe guideline documents, 1987 and 2000.

Newland,M. Christopher

Auburn University

Dr. M. Christopher Newland is Alumni Professor in the Department of Psychology at Auburn University. His research interests include the neurobehavioral toxicity of heavy metals, with an emphasis on the lifespan neurotoxicity of methylmercury. He has published numerous papers on the behavioral effects of methylmercury in young, adult, and aging animals. In these, he has investigated both developmental and chronic, adult-onset exposure to methylmercury in experimental models. Dr. Newland has served on advisory panels for the U.S. Environmental Protection Agency, the Agency for Toxic Substances and Disease Registry, and the National Research Council. On these panels he has participated in reviews of methylmercury, elemental mercury, manganese, and tetrachloroethylene. In addition, he has participated in the reviews of the Neurotoxicology Division of the U.S. EPA and was a regular member of the Neurotoxicology and Alcohol study section of the NIH. His research has been supported by the NIEHS, NIDA, and U.S. EPA. Dr. Newland is past president of the Neurotoxicology Specialty Section of the Society of Toxicology and of the Behavioral Toxicology Society. He has served on several editorial boards and is an Associate Editor of Neurotoxicology. He received his MS and Ph.D. in experimental psychology from the Georgia Institute of Technology and had postdoctoral fellowships in Environmental Health Science (now Environmental Medicine) at the University of Rochester.

Osa, Richard H.**Bonestroo, Inc.**

Mr. Richard Osa's career spans the research, industry, and consulting communities. His clients have benefitted from his ability to serve as a "translator"--communicating research results to the front line engineers in the field, and industrial needs to research organizations and government regulators. With over a decade of involvement with mercury technical and regulatory issues Mr. Osa would bring a unique perspective to the panel.

Paciorek, Christopher J.**University of California -Berkeley**

Dr. Christopher Paciorek is visiting assistant professor in the Statistics Department at the University of California, Berkeley and adjunct assistant professor in the Biostatistics Department at Harvard School of Public Health, where he was an assistant professor from 2005 to 2009. He has a B.A. in biology from Carleton College, an M.S. in botany (ecology) from Duke University, and a Ph.D. in statistics from Carnegie Mellon University. Dr. Paciorek was the winner of the Health Effects Institute new investigator award in 2006 and of the 2003 Savage award for the best Ph.D. dissertation in Bayesian theory and methods. Dr. Paciorek is an environmental statistician who has worked in the areas of environmental health, ecology, climate, and global health. His research focuses on statistical methods for spatial and spatio-temporal data and on Bayesian methods. In particular, he has developed statistical models to estimate spatio-temporal variation in air pollution. He has expertise in the statistical effects of spatial structure on epidemiological analyses. In this context he has analyzed the impact of spatially-varying unmeasured confounding variables and the impact of uncertainty in estimated exposures. He also has experience in assessing and combining information from ground observations, remote sensing, and deterministic models for air pollution. More generally, he has developed Bayesian statistical models to combine information from diverse data sources for applications in climate, global health, and environmental health.

Ralston, Nicholas**University of North Dakota**

Dr. Nicholas Ralston's research program investigates the molecular mechanisms of mercury toxicity and the influence of mercury exposures on selenium physiology. Current studies by his group are evaluating human health effects and risks associated with environmental mercury exposures as well as therapeutic treatment, environmental remediation and other approaches to reduce risks from mercury exposures. He has a Ph.D. in Biomedical Research (1996) from Mayo Medical Center in Rochester, MN and a B.S. in Biology (1978) from Mayville State University in Mayville, ND. Dr. Ralston's research investigates mercury toxicology and the pathological effects of mercury's irreversible inhibition of selenium-dependent enzymes using computational, molecular, cellular, animal, epidemiological and environmental study models. His primary research interests are the pathophysiology of developmental and adult onset mercury toxicity and therapeutic treatment using dietary selenium from ocean fish to prevent and reverse toxicity. Current collaborations with human studies in the Seychelles and Hawaiian Islands are complemented by extensive studies of mercury and selenium contents in ocean and fresh water fish. Other studies of mercury-selenium interactions span from molecular chemistry, brain cell cultures, insects, zebra mussels, Humboldt squid, Irrawaddy dolphins, beluga whales, and human heart, pituitary, and brain tissues. Selenium-

dependent remediation approaches to permanently retire mercury contaminating soils and waters are currently a growing area of research.

Rathbun, Stephen L.

University of Georgia

Dr. Stephen L. Rathbun is Professor of Biostatistics in the Department of Epidemiology and Biostatistics at the University of Georgia. He received B.S. and M.S. degrees in Biology from Florida State University in 1976 and 1980 respectively, after which he worked as a field ecologist at Tall Timbers Research Station until returning to complete his education in 1985. In 1990 he received his Ph.D. in Statistics from Iowa State University. Dr. Rathbun has served on the Regional Advisory Board for the Eastern North American Region (ENAR) of the International Biometric Society, as ENARs representative to the American Association for the Advancement of Science Section on Geology and Geography, on the Program Committee for ENAR, and as Chair of the Distinguished Achievement Awards Committee for the Environmetrics Section of the American Statistical Association. He is an Associate Editor for Environmental and Ecological Statistics. In addition, Dr. Rathbun has served on the Estuarine Review Group for the Environmental Monitoring and Assessment Program sponsored by Environmental Protection Agency (EPA), a Peer Review Panel for the Water and Watersheds competition cosponsored by the National Science Foundation (NSF) and EPA, and on the Statistical Review Panel for the Fisheries Assessment in the Florida Marine Research Institute. Dr. Rathbun's research interests include theory and application of spatial and temporal data analysis. Applications have been published in ecology, environmental sciences, seismology, and psychology. He has developed new methods for analyzing the impact of time- and/or space-varying covariates on the point patterns of trees and recurrent smoking events, explored alternative distance metrics for spatial analysis of estuarine data, and zero-inflated counts data in ecology. Of particular relevance to the SAB Mercury Review Panel, Rathbun (2006; Journal of Agricultural, Biological and Environmental Statistics 11, 317-336) has developed a method for spatial analysis of left-censored data, including methods for parameter estimation and spatial prediction. In this paper, Rathbun illustrated these methods on methyl mercury, phosphorus, and sulfate data collected as part of EPA's South Florida Ecosystem Assessment Project.

Reash, Robin

American Electric Power

Mr. Robin J. (Rob) Reash is a Principal Environmental Scientist for American Electric Power's Water and Ecological Resource Services Section in Columbus, OH. His principal duties include designing and conducting technical studies for NPDES (wastewater) compliance issues, conducting applied research on the fate and effects of power plant pollutants (e.g., mercury, selenium, arsenic), and tracking the development of water quality standards at the federal and state level. His areas of expertise include the bioaccumulation and terrestrial deposition of mercury and selenium, thermal biology and effects, ecotoxicology, and trace metal chemistry. Mr. Reash participated in a SETAC (Society of Environmental Toxicology and Chemistry) workshop on evaluating environmental indicators after the implementation of mercury emission controls, and co-authored a chapter of the proceedings book. He served on the planning committee of the 8th International Conference on Mercury as a Global Pollutant (Madison, WI). In 2010 Mr Reash participated in a SETAC Pellston Workshop on the ecological assessment of selenium. In 2005, he served on a U.S. EPA Science Advisory Board Panel evaluating EPA's methodology for deriving aquatic life criteria. In 2002 he

served as an external peer reviewer for U.S. EPA's draft revised aquatic life criteria for selenium. His current research activities include: 1) assessment of mercury, methylmercury, and selenium levels in Ohio River fish collected near coal-fired power plants; 2) derivation of a site-specific human health methylmercury criterion for a tributary of the Ohio River; 3) assessment of atmospheric deposition/bioaccumulation of mercury and other trace metals in lichen samples near coal-fired power plants; and 4) selenium speciation and biogeochemistry in coal combustion by-products (co-investigator with researchers from West Virginia University). He has published over 25 papers in peer-reviewed journals and has authored or co-authored five book chapters. Before joining AEP, Mr. Reash was employed as an Environmental Specialist for the Oklahoma Water Resources Board, and was a fisheries intern with Ohio EPA. He is a member of the Society of Environmental Toxicology and Chemistry. In 1992 he served as President of the Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry. Mr. Reash received a B.A. degree from Wittenberg University and a M.S. degree from the Ohio State University. He has training in Oceanography and Marine Biology from the Duke University Marine Laboratory. In 1998 Mr. Reash was certified as a Certified Fisheries Scientist by the American Fisheries Society.

Roberts, Stephen M.

University of Florida

Dr. Stephen M. Roberts is Professor at the University of Florida with joint appointments in the College of Veterinary Medicine, College of Medicine, and College of Public Health and Health Professions. He also serves as Director of the Center for Environmental & Human Toxicology at the University of Florida. Dr. Roberts received a B.S. in Pharmacy from Oregon State University and a Ph.D. from the University of Utah College of Medicine. After a postdoctoral fellowship at SUNY Buffalo (1977 – 1980), he served on the faculties of the University of Cincinnati College of Pharmacy (1980-1985) and the College of Medicine at the University of Arkansas for Medical Sciences (1986-1989). Dr. Roberts has been a faculty member at the University of Florida since 1989. His research addresses mechanisms of toxicity, particularly involving the liver and immune system. Dr. Roberts also has an active research program in toxicokinetics, especially involving bioavailability of environmental toxicants, as well as approaches to evaluation of potential toxicity of nanomaterials. He serves as an advisor to regulatory agencies on topics related to risk assessment.

Smith, Eric P.

Virginia Tech

Dr. Eric P. Smith has been a member of the Statistics Department at Virginia Tech faculty since 1982 and chair of the department since 2006. His research focuses on the development and application of statistical methods to help understand and solve environmental and ecological problems. He 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. He has worked on a variety of statistical and scientific problems from areas such as engineering, education and natural resources. Dr. Smith teaches courses on multivariate analysis and linear models (regression, analysis of variance). Dr. Smith serves as Associate Editor of *Environmetrics* and is a former associate editor of the *Journal of Agricultural, Biological and Environmental Statistics* and the *Journal of the American Statistical Association*. He has supervised 14 Ph.D. students.

Stern, Alan

New Jersey Dept. of Environmental Protection/Univ. of Med. & Dentistry of NJ-School of Public Health

Dr. Alan Stern is the Section Chief for Risk Assessment in the Division of Science, Research and Technology of the New Jersey Department of Environmental Protection; Adjunct Associate Professor in the Department of Environmental and Occupational Health of the University of Medicine and Dentistry of New Jersey-School of Public Health; and Adjunct Associate Professor in the Department of Environmental and Occupational Medicine of the University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School. He received a bachelor's degree in biology from the State University of New York at Stony Brook (1975), a master's degree in cellular and molecular biology from Brandeis University (1978), a master of public health degree (1981) and a doctorate in public health from the Columbia University School of Public Health (1987). Dr. Stern is board-certified in toxicology by the American Board of Toxicology (Diplomate of the American Board of Toxicology). Dr. Stern's areas of expertise include risk assessment and exposure assessment including the application of probabilistic techniques to quantitative estimation of exposure and risk. His research interests have focused on heavy metals including lead, mercury, chromium and cadmium. Dr. Stern was a member of the National Research Council/National Academy of Sciences Committee on the Toxicology of Methylmercury (1999-2000). Other recent panels, committees and workshops Dr. Stern has participated in by invitation include: the U.S.EPA Colloquium on Soil/Dust Ingestion Rates and Mouthing Behavior for Children and Adults (May 24-25, 2005, Arlington VA); U.S.EPA Toxicological Review of Toluene In Support of Summary Information on the Integrated Risk Information System (IRIS) (Feb. 5, 2004, Washington, D.C. – Panel Chair); U.S.EPA Expert Panel on Development of Dose-Response Functions for the Neurotoxicity of Methylmercury (Nov. 4, 2002, Washington, D.C.); U.S.EPA Peer-Review Panel for the Reference Dose and Reference Concentration Process (June 19, 2002, Washington, D.C.); and SCOPE (Scientific Committee on Problems of the Environment) Environmental Cadmium in the Food Chain: Sources Pathways and Risks. (September 13-16, 2000, Brussels, Belgium). Dr. Stern has authored numerous articles in peer-reviewed journals, and has recently contributed a book chapter on Exposure Assessment for Neurotoxic Metals in "Human Developmental Neurotoxicology" D. Bellinger, ed. (in press). He also regularly teaches the graduate course in Environmental Health Risk Assessment in the Univ. of Medicine & Dentistry of New Jersey-School of Public Health. As a full-time employee of state government, Dr. Stern does not routinely solicit or receive grants for research from outside agencies or organizations. Within the last two years, however, he received one contract from the U.S.EPA for research: EPA Order No. 3W-1182-NAGX "Reconstruction of the Maternal Methylmercury Intake Dose from Cord Blood Data," initiated 3/2003, completed 7/2004; total payment (to NJ Dept. of Environmental Protection): \$30,020.

Sunderland, Elsie

Harvard School of Public Health

Dr. Elsie Sunderland is Mark and Catherine Winkler Assistant Professor of Aquatic Science at the Harvard School of Public Health. She is part of the faculty of the Department of Environmental Health and is also affiliated with the Harvard Atmospheric Chemistry Modeling Group in the School of Engineering and Applied Sciences. Dr. Sunderland's research combines field studies with modeling tools to study how the fate, transport and bioaccumulation of chemicals affect human

exposures and risks. Her research connects two areas: biogeochemical processes affecting water quality, and studies in public health that characterize toxicity mechanisms and dose-response relationships of environmental exposures. Over the past several years, her research has focused on the biogeochemical cycling of mercury and impacts of anthropogenic emissions on human health. Previously, she worked for five years with the U.S. Environmental Protection Agency's Office of Research and Development in Washington DC. During this time, she received EPA's highest level Scientific and Technological Achievement Award (STAA Level 1) and Gold Medal for Exceptional Service. Dr. Sunderland received her Ph.D. in Environmental Toxicology from the School of Resource and Environmental Management at Simon Fraser University, Canada and a B.Sc. from McGill University, Canada.

Swain,Edward (updated biosketch inserted on 4/26/11 at candidate's request)

Minnesota Pollution Control Agency

Dr. Edward B. Swain attended Carleton College and received his Ph.D. in Ecology from the University of Minnesota. He has been a research scientist for the Minnesota Pollution Control Agency since 1988, where his work has centered on air pollutants that affect surface water—largely concentrating on mercury, but also addressing acid deposition and climate change. Since 1998 he has served on the adjunct faculty of the University of Minnesota, advising graduate students studying the fate of atmospheric mercury emissions. Dr. Swain's research has broadly addressed atmospheric deposition of mercury and factors that control accumulation of mercury in fish. In addition, Dr. Swain has been responsible for quantifying all sources of mercury to the atmosphere for the state of Minnesota. Dr. Swain's broad knowledge of the sources and fate of mercury in the environment has led to his participation in national groups addressing mercury. He was a peer reviewer on multiple USEPA mercury panels, including: the Mercury Report to Congress; a STAR grant review panel; the 2001 Methylmercury Water Quality Criterion; and Mercury Maps, a tool that relates changes in mercury air deposition rates to changes in mercury fish tissue concentrations on a national scale. Dr. Swain has also participated in a number of expert workgroups, including: a workshop to design a national mercury monitoring program; an advisory committee to the METAALICUS mercury-addition experiment; a panel that developed guidance for quantifying atmospheric mercury deposition from lake sediment cores; a workgroup that synthesized mercury deposition records from Vermont to Minnesota; and, in preparation for the 2006 international conference on mercury, Dr. Swain chaired the panel charged with summarizing knowledge on the socioeconomic effects of mercury pollution. This last effort reviewed all the publications that had quantified the public health benefits of reducing mercury emissions in the United States. In addition, in 2007 Dr. Swain co-authored Minnesota's mercury TMDL, the first state-wide plan to reduce atmospheric loading of mercury to be approved by the USEPA. Minnesota's TMDL employed an innovative methodology that was promptly copied by the New England states and also approved by the USEPA.

Valsaraj,Kalliat**Louisiana State University**

Professor Valsaraj received his M.Sc. in Chemistry from the Indian Institute of Technology, Madras in 1980 and his Ph.D in Chemistry from Vanderbilt University in 1983. He has been on the faculty of chemical engineering at LSU since 1986 and presently serves as the Department Chair and Roddey Distinguished Professor in Chemical Engineering. His research area is in environmental chemical engineering. He has had broad research experience in wastewater treatment, atmospheric chemistry and, modeling the fate and transport of contaminants in all three environmental media (air, water and soil/sediment). His present research is concerned with the transformations of pollutants on atmospheric aerosols, mercury sequestration in sediments and high pressure, low temperature phase equilibrium studies. He has provided consulting and expert opinions to various industries, State and Federal agencies. He is the author of 1 textbook, 156 peer-reviewed journal articles, 27 book chapters and 2 U.S. patents. His research has been supported by the NSF, EPA, DOE, DOD, USGS and private industries.

van Wijngaarden,Edwin**University of Rochester**

Dr. Edwin van Wijngaarden is Associate Professor of Community and Preventive Medicine, Environmental Medicine, and Dentistry at the University of Rochester School of Medicine and Dentistry, Rochester, NY. He is Chief of the Division of Epidemiology and Director of the Undergraduate Public Health-related Programs. Dr. van Wijngaarden received a MSc in Environmental Sciences from Wageningen University in The Netherlands (1998), and a PhD in Epidemiology from University of North Carolina at Chapel Hill (2002). His research is focused primarily on the potential effects of occupational and environmental exposures (methyl mercury, lead, and pesticides) on nervous system outcomes in children and older adults, including behavioral and cognitive development, mental disorders, and dementia and related disorders. Dr. van Wijngaarden is a member of the American College of Epidemiology (ACE), International Society for Environmental Epidemiology (ISEE), American Public Health Association (APHA), and Society for Epidemiologic Research (SER). He is an Associate Editor for the scientific journal Neurotoxicology and serves on the editorial board of International Archives of Occupational and Environmental Health. He is currently a member of the Publications Committee of ACE, and has served as peer reviewer for more than 20 scientific journals. He was a Scientist Reviewer for NIOSH NORA Peer Review, Panel C (Epidemiology and Surveillance, FY2010) and an external peer reviewer of the NIOSH Criteria Document Update: Occupational Exposure to Hexavalent Chromium (NIOSH Docket Number 144).

Wright,Robert**Harvard School of Public Health**

Dr. Robert Wright is a pediatrician and environmental scientist at Children's Hospital, Boston and Harvard School of Public Health(HSPH). He completed post-doctoral training in epidemiology, genetics and medical toxicology. He is one of fewer than 50 Pediatricians board certified in Medical Toxicology. Dr Wright currently serves as the section editor for Toxicology for Current Opinion in Pediatrics. He is the Principal Investigator of 2 ongoing birth cohorts funded by the Environmental Protection Agency and the National Institute of Environmental Health Sciences- the (Metals

Assessment Targeting Community Health) MATCH study in Tar Creek, Oklahoma, and a newly funded birth cohort in Mexico City (Early Life Exposure in Mexico to Environmental Toxicants-ELEMENT project) in collaboration with the National Institute of Public Health, Mexico. These cohorts address the roles of metals, social stressors and genetic susceptibility to metals in neurodevelopment. He is on faculty at both Harvard Medical School and Harvard School of Public Health, where he directs the graduate course in Toxicology (EH504, cross referenced in both schools). Clinically, Dr. Wright works in the Children's Hospital, Boston- Pediatric Environmental Health Subspecialty Unit (PEHSU), specializing in evaluating children with health problems of suspected environmental origin. PEHSUs are a series of clinics established by the US Agency for Toxic Substances and Disease Registry (ATSDR) organized by the Association of Occupational and Environmental Clinics. His research expertise is in the field of gene-environment interaction in neurodevelopment and the role of psychosocial factors as modifiers of metal toxicity. He has published over 80 papers, most of which deal with Environmental Health issues and served on numerous national committee/advisory boards in the field of Pediatric Environmental Health, including the Agency for Toxic Substances and Disease Registry, the Academic Pediatric Association, National Research Council and the National Institutes of Health. Dr. Wright directs the Metals Research Core at HSPH, and its environmental chemistry laboratory. He is the Research Director of the Region 1, Pediatric Environmental Health Subspecialty Unit and member of the American Academy of Pediatrics Committee on Environmental Health.

Yanosky, Jeff D.

Penn State College of Medicine

Dr. Jeff D. Yanosky is currently an Assistant Professor in the Epidemiology Division of the Department of Public Health Sciences in the Penn State College of Medicine. His educational background includes undergraduate and Master's degrees in environmental health from The University of Georgia and a Doctorate in environmental science and engineering from the Harvard School of Public Health. His research interests focus on the statistical modeling of air pollutant concentrations, including fine and coarse mode particulate matter, ozone, nitrogen oxides, ultrafine particles, carbon monoxide, and other pollutants, in order to better understand both acute (short-term) and chronic (long-term) human exposures and their impacts on human health. He has extensive experience and training in spatial statistics and environmental health, specifically in air pollution exposure assessment. He is currently developing GIS-based spatiotemporal statistical models of air pollutant concentrations that will be used to improve understanding of the relationship between chronic air pollution exposure and several aspects of human health, including incidence rates of cardiovascular disease, stroke, lung cancer, and other endpoints. He is also interested in modeling air pollutant emissions from traffic and the impacts of traffic-related air pollution on health. In addition, he is interested in using measurements of human exposure to air pollution, as well biomarkers of exposure and effect, to better link exposure with disease, and in the statistical modeling of health effects using advanced techniques such as generalized additive models and generalized additive mixed models. He is currently a member of the International Society of Exposure Science and the International Society of Environmental Epidemiology.

Yarwood, Gregory

Environ International Corp.

Dr. Greg Yarwood, a Principal at ENVIRON, is an international expert with over 20 years experience in atmospheric chemistry, air quality modeling, photochemical model development, interpreting ambient air quality data, and emissions inventory development especially for motor vehicles and biogenic sources. He is an experienced project manager and provides technical direction for projects at ENVIRON. Greg directs air quality, meteorological, and emissions modeling studies for clients in government and industry, with emphasis on photochemical air pollution issues such as ozone, secondary particulate matter (PM), visibility, and air toxics including mercury. Greg leads development of ENVIRON's Comprehensive Air quality Model with extensions (CAMx: <http://www.camx.com>) and implemented advanced modeling techniques for source attribution and sensitivity analysis including OSAT, PSAT, DDM, HDDM and Process Analysis. He also designed the reactive tracer methodology used for modeling air toxics in CAMx. Greg developed for USEPA the Carbon Bond 2005 (CB05) chemical mechanism that is used for ozone and PM in CAMx and EPA's CMAQ model. He implemented mercury chemistry in CAMx including mercury tagging for source attribution. He performed international air quality studies for China and Africa sponsored by agencies such as the World Bank. Greg is the primary technical resource for the state of Texas for ozone modeling of the Houston, Beaumont and Dallas non-attainment areas, and designed comprehensive air quality management plans, including directing all technical activities for Northeast Texas. Greg holds a PhD in chemistry from Cambridge University. He is a member of USEPA's Board of Scientific Counselors for the Clean Air Research Program.