

Scientific Tools and Approaches for Sustainability

Committee

Michael C. Kavanaugh

Chair

Michael C. Kavanaugh (NAE) is a Senior Principal of Geosyntec Consultants, Inc., an international engineering and consulting firm. His research interests have included hazardous waste management, soil and groundwater remediation, process engineering, industrial waste treatment, technology evaluations, strategic environmental management, compliance and due diligence auditing, water quality, water and wastewater treatment, and water reuse. Dr. Kavanaugh serves as a member of the National Research Council (NRC) Roundtable on Science and Technology for Sustainability. He served as chair of the NRC Board on Radioactive Waste Management and the NRC Water Science and Technology Board. He served as a member of the NRC Committee on Incorporating Sustainability in the U.S. Environmental Protection Agency. Dr. Kavanaugh is a registered chemical engineer in California, a Board Certified Environmental Engineer (BCEE) of the American Academy of Environmental Engineers and Scientists (AAEES), and a member of the National Academy of Engineering (elected in 1998). He received a Ph.D. in civil/environmental engineering from the University of California, Berkeley.

Sherburne B. Abbott

Member

Sherburne “Shere” B. Abbott is Vice President for Sustainability Initiatives and University Professor of Sustainability Science and Policy at Syracuse University, and oversees the Syracuse Center of Excellence for Environmental and Energy Systems. Prior to this appointment in 2011, she was a senior advisor to President Obama, serving as the Senate-confirmed associate director for environment of the Office of Science and Technology Policy in the Executive Office of the President, overseeing the approximately \$5B federal portfolio of research and development for the environment and natural resources. Previously, Ms. Abbott was a faculty member at the University of Texas at Austin and served as the director of the Center for Science and Practice of Sustainability in the Office of the Executive Vice President and Provost. From 2003-2005, she served as chief international officer of the American Association for the Advancement of Science (AAAS), where she was responsible for the International Office, and where she established and directed the Center for Science, Innovation and Sustainable Development. Prior to this appointment, she consulted on environmental science and sustainable development for various organizations. Until 2001, Ms. Abbott worked at the NRC over a 17-year period, serving in several capacities, including as executive director of the Board on Sustainable Development. She also served as assistant scientific program director of the U.S. Marine Mammal Commission. Ms. Abbott earned a master’s degree in environmental science and natural resource policy from Yale University, where she was a Dodge Fellow in Human-Animal Ecology.

Dr. David T. Allen

Member

David T. Allen is Melvin H. Gertz Regents Professor in Chemical Engineering at the University of Texas in Austin. He is also director of the university's Center for Energy and Environmental Resources. Dr. Allen serves as chair of the U.S. EPA Science Advisory Board. He is Editor-in-Chief of the American Chemical Society journal: Sustainable Chemistry & Engineering. His research focuses on urban air quality and the engineering of sustainable systems, and he has been lead investigator for multiple air quality studies, which have had a substantial impact on the direction of air quality policies. Dr. Allen served on several NRC committees and the Board on Environmental Studies and Toxicology. He holds a Ph.D. in chemical engineering from the California Institute of Technology.

Praveen Amar

Member

Praveen Amar is an independent consultant based in Boston, who works in the areas of energy, environment, and climate strategies. Previously, he was senior advisor to the Clean Air Task Force (CATF), an environmental organization with a focus on environmental protection through research, advocacy, collaboration, and innovation. At CATF, he investigated environmental effects of Marcellus shale gas development in Pennsylvania, and with industry participation, developed air, climate, and water related performance standards for unconventional gas development. Dr. Amar serves on the science advisory committee for the New York State Energy Research and Development Authority's (NYSERDA) environmental research program. He was director of science and policy at Northeast States for Coordinated Air Use Management (NESCAUM), a nonprofit association of states air-quality agencies in the Northeast, where he focused on monetizing the public-health benefits of controlling mercury emissions from coal-fired power plants in the United States and evaluating potential future effects of global climate change on regional ground-level air quality. He is a member of the US Environmental Protection Agency (EPA) Advisory Council on Clean Air Compliance Analysis. He is currently serving on the National Research Council's Board on Environmental Studies and Toxicology. He served as a member of EPA's Clean Air Scientific Advisory Committee panel on review of secondary national ambient air quality standards for sulfur dioxide and nitrogen oxides. He is a licensed professional engineer in California and received a PhD in engineering from the University of California, Los Angeles.

Bradford D. Brooks

Member

Bradford Brooks is an IBM Fellow in recognition of his sustained achievement and leadership regarding IBM's involvement with complex materials that are used in the electronics and information technology industries. Dr. Brooks' work focuses on manufacturing processes within the information technology industry, toxicology risk assessments for information technology products, technologies and materials that are newly emerging for industrial use, environmental risk management, industrial chemical security, and chemical management laws and regulations. He received a Ph.D. in immunology from Montana State University, Bozeman.

Ingrid C. Burke

Member

Ingrid C. Burke is director of the Haub School and Ruckelshaus Institute of Environment and Natural Resources at the University of Wyoming. She also is a professor and holds a Wyoming Excellence Chair in the Departments of Botany and Renewable Resources. She is a former professor and University Distinguished Teaching Scholar in the College of Natural Resources at Colorado State University. Dr. Burke is an ecosystem scientist, with particular expertise in carbon and nitrogen cycling of semi-arid ecosystems. She directed the Shortgrass Steppe Long Term Ecological Research team for 6 years, as well as other large interdisciplinary research teams funded by the National Science Foundation, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Institutes of Health. She was designated a U.S. Presidential Faculty Fellow, has served on the NRC Board on Environmental Science and Toxicology, and was a member of the NRC committee tasked with developing recommendations on A New Biology for the 21st Century: Ensuring That the United States Leads the Coming Biology Revolution. She served as co-chair of the NRC Committee on Economic and Environmental Impacts of Increasing Biofuels Production. She was recently elected as a Fellow of the American Association for the Advancement of Science. Dr. Burke received a Ph.D. in botany from the University of Wyoming.

John C. Crittenden

Member

John C. Crittenden (NAE) is a professor and director of the Brook Byers Institute for Sustainable Systems at the Georgia Institute of Technology. He is a Georgia Research Alliance (GRA) Eminent Scholar in Sustainable Systems and occupies the Hightower Chair for Environmental Technologies. His research includes pollution prevention, physical-chemical processes, nanotechnology, air and water treatment, mass transfer, and numerical methods. With insight gained into how these processes interconnect with each other, as well as with people, markets, and nature, he develops tools and educational programs that connect social decision making, regional development, material flows, energy use, and local, regional, and global environmental impacts. He served on the EPA Science Advisory Board and the Engineering Advisory Board for the National Science Foundation. Dr. Crittenden was elected to the National Academy of Engineering in 2002. He received a Ph.D. in civil engineering from the University of Michigan.

James Fava

Member

James Fava is senior director at PE International and co-founder of Five Winds International. He was previously a Vice President at both Weston Solutions, Inc. and Battelle. He specializes in the integration of life cycle based environmental and social aspects into core business and government policies and practices. He has directed and managed hundreds of projects to help solve and prevent environment, health, safety, and resource productivity problems. He is founder of the Society of Environmental Toxicology and Chemistry's (SETAC's) Life Cycle Assessment (LCA) Advisory Group and headed the U.S. delegation in the development of the International Organization for Standardization (ISO) LCA standards. He is currently co-chair of the United Nations Environment Programme (UNEP)/SETAC Life Cycle Initiative and served on the World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD) Steering Committee for the Scope 3 and Product GHG Protocol efforts. For nearly 20 years, he has directed (and founded) the Product Sustainability Roundtable. He received a Ph.D. in environmental toxicology and fisheries biology from the University of Maryland, College Park.

Paul Gilman

Member

Paul Gilman is senior vice president and chief sustainability officer of Covanta Energy Corporation. Previously, he served as director of the Oak Ridge Center for Advanced Studies and as Assistant Administrator for the Office of Research and Development in the U.S. EPA. He also worked in the Office of Management and Budget, where he had oversight responsibilities for the US Department of Energy (DOE), EPA, and all other science agencies. In DOE, he advised the secretary of energy on scientific and technical matters. From 1993 to 1998, Dr. Gilman was the executive director of the NRC's Commission on Life Sciences and the Board on Agriculture and Natural Resources. He has served on numerous NRC committees. Dr. Gilman received a Ph.D. in ecology and evolutionary biology from Johns Hopkins University.

Michael R. Greenberg

Member

Michael R. Greenberg is distinguished professor and associate dean of the faculty of the Edward J. Bloustein School of Planning and Public Policy, Rutgers University. He is also director of the school's Environmental Assessment and Communication Group. Dr. Greenberg's research areas include urban redevelopment, risk analysis, and environmental health policy. He has written 30 books and more than 300 articles. His books include *Urbanization and Cancer Mortality* (1983), *Hazardous Waste Sites: The Credibility Gap* (1984), *Public Health and the Environment* (1987), *Environmental Risk and the Press* (1987), *Environmentally Devastated Neighborhoods in the United States* (1996), *The Reporter's Environmental Handbook* (2003), *Environmental Policy Analysis & Practice* (2008), *The Environmental Impact Statement After Two Generations: Managing Environmental Power* (2011), and *Nuclear Waste Management, Nuclear Power and Energy Choices: Public Preferences, Perceptions, and Trust* (2012). He has been a member of past National Research Council committees that focused on setting priorities for chemical waste-site remediation, destruction of the U.S. chemical weapons stockpile and nuclear weapons, and degradation of the U.S. government physical infrastructure. He received awards for research from the Environmental Protection Agency, the Society of Professional Journalists, the Public Health Association, the Association of American Geographers, and the Society for Risk Analysis. He served as area editor for social sciences and then editor-in-chief of *Risk Analysis: An International Journal* during the period 2002-2103, and continues as associate editor for environmental health for the *American Journal of Public Health*. Dr. Greenberg holds a PhD from Columbia University in environmental and medical geography.

Andrew M. Hutson

Member

Andrew M. Hutson is Director of Global Value Chain Initiatives at the Environmental Defense Fund (EDF) and leads the development and implementation of value chain strategies to reduce the impacts of trade and commerce on ecosystems. This includes using private sector leverage to craft deforestation-free supply chains in the Amazon and improve the energy efficiency of Chinese factories. Before joining EDF, he helped launch the Manufacturing Leadership Board, a program for senior-most manufacturing executives, served as a consultant to business and non-profit organizations in both developing and industrialized countries, and worked as a business process analyst for Accenture. His interest in the global environment was sparked during his volunteer service with the RARE Conservation in Honduras in the late 1990s. He was named a Graduate Fellow of the American Academy of Political and Social Science in 2006. Dr. Hutson holds a Ph.D. in public policy from the University of North Carolina at Chapel Hill.

Catherine L. Kling

Member

Catherine Kling is Charles F. Curtiss Distinguished Professor of Economics and Director of the Center for Agricultural and Rural Development (CARD) at Iowa State University. She is a Fellow of the Agricultural and Applied Economics Association and past President of the Association of Environmental and Resource Economists. Dr. Kling leads an interdisciplinary research group focusing on water quality and agricultural practices, has published over 60 journal articles and refereed book chapters, has received seven awards from professional associations for her research, has been PI or co-PI on over \$7 million of grants (including NSF, EPA, USDA, and state agencies), and has held editorial positions at seven economics journals. Dr. Kling's engagement in the policy process includes over ten years of service as a member of the EPA's Science Advisory Board and a member of five NRC committees. She holds a Ph.D. in economics from the University of Maryland.

H. S. Matthews

Member

H. Scott Matthews is a Professor of Civil and Environmental Engineering and Engineering and Public Policy at Carnegie Mellon University. He is research director for the Green Design Institute, an interdisciplinary research consortium focused on identifying and assessing the environmental impacts of environmental systems and helping businesses manage their use of resources and toxic materials. His research focuses on creating data-rich corporate and policy decision support tools in the areas of sustainable engineering, environmental life cycle assessment, life cycle management of physical and digital infrastructure systems, and carbon footprinting. He is a member of the NRC Board on Environmental Studies and Toxicology and previously served on the NRC Committee on Hidden Costs of Energy (2010). He is Associate Editor for the Journal of Industrial Ecology and has co-edited issues on sustainable infrastructure in the American Society of Civil Engineers (ASCE) Journal of Infrastructure Systems. He received the Laudise Prize from the International Society for Industrial Ecology and numerous AT&T Faculty Fellow in Industrial Ecology awards. He received a Ph.D. in economics from Carnegie Mellon University.

Erik Petrovskis

Member

Erik Petrovskis is director of Environmental Compliance and Sustainability at Meijer, Inc. Previously, he was a principal environmental engineer for Geosyntec Consultants in Ann Arbor, Michigan. His work focuses on environmental management plans for large, complex manufacturing and service facilities and the remediation and closure of industrial properties impacted by chlorinated solvents, metals, and petroleum hydrocarbons with a specialization in the development and implementation of innovative in situ groundwater remediation technologies. Dr. Petrovskis' research is in the field of bioaugmentation and surfactant enhanced aquifer remediation and the use of molecular biological tools at chlorinated solvent sites. Dr. Petrovskis works on ISO 14001 Environmental Management System implementation, auditing, and training. He provided project management and technical direction on projects for the General Services Administration that were recognized as award-winning examples of environmentally sustainable real property management. He sits on the Interstate Technology and Regulatory Council (ITRC) and the Huron River Watershed Council Board and previously served on the Sustainable Remediation Forum (SURF) Framework Team. Dr. Petrovskis is an adjunct professor at the University of Michigan, Ann Arbor, where he teaches water/wastewater treatment design and sustainability engineering principles. He holds a Ph.D. in environmental engineering from the University of Michigan, Ann Arbor.

Helen H. Suh

Member

Helen H. Suh is an Associate Professor in the Health Sciences Department at Northeastern University. She is also Senior Fellow at the National Opinion Research Center (NORC) at the University of Chicago and an adjunct faculty member at the Harvard School of Public Health. Her research focuses on assessing multi-pollutant impacts on human health, and the development of GIS-based spatio-temporal modeling tools for epidemiological research, and examination of the individual and joint impacts of pollution and lifestyle on health. Dr. Suh has performed advisory work in environmental health for numerous international, national, and local organizations. She is currently a member of the EPA Clean Air Scientific Advisory Committee. Helen Suh received a Sc.D. in environmental health sciences from the Harvard School of Public Health.

Alison Taylor

Member

Alison Taylor is vice president for sustainability-Americas at Siemens Corporation. In this position, she is responsible for driving the sustainability program for the Americas and acting as a resource for sustainability initiatives across Siemens' business sectors. In her previous role as Director, Government Affairs, Ms. Taylor represented Siemens' position on environmental issues with Congress and the Executive Branch. Prior to joining Siemens, she was chief counsel for the U.S. Senate Committee on Environment and Public Works and counsel to the U.S. House Committee on Energy and Commerce. She received a B.A. in biology from Duke University and a J.D. from the University of Denver.

Terry F. Yosie

Member

Terry F. Yosie is president and CEO of the World Environment Center, a nonprofit, nonadvocacy organization whose mission is to advance sustainable development through the private sector in partnership with government, nongovernment organization, academic, and other stakeholders. He has 35 years of professional experience in managing and analyzing the use of scientific information in the setting of environmental standards. He was the first executive director of U.S. EPA's Clean Air Scientific Advisory Committee. He served as director of U.S. EPA's Science Advisory Board from 1981 to 1988 and instituted policies and procedures for enhancing the use of scientific information in regulatory decision-making. Dr. Yosie was vice president for health and environment at the American Petroleum Institute and executive vice president of Ruder Finn consultancy, where he was responsible for the firm's environmental-management practice. From 2001 through 2005, Dr. Yosie served as the American Chemistry Council's vice president for the Responsible Care initiatives, a performance program that includes environmental, health, and safety management; product stewardship; security; and other aspects of the business value chain. He has served on a number of NRC committees and boards, including the Committee to Review the Structure and Performance of the Health Effects Institute, the Committee on Research Priorities for Airborne Particulate Matter, and the Board on Environmental Studies and Toxicology. He is the author of over 70 publications on the use of scientific information in the development of public health and environmental policies and strategies to advance sustainable development. He earned a doctorate from the Dietrich College of Humanities and Social Sciences at Carnegie Mellon University. He is the 2013 recipient of that Universities Alumni Achievement Award.