

Reducing Stormwater Discharge Contributions to Water Pollution

Committee

Claire Welty

Chair

Claire Welty, Chair, is the Director of the Center for Urban Environmental Research and Education and Professor of Civil and Environmental Engineering at University of Maryland, Baltimore County. Dr. Welty's work has primarily focused on transport processes in aquifers; her current research interest is in watershed-scale urban hydrology, particularly in urban groundwater. Prior to her appointment at UMBC, Dr. Welty was a faculty member at Drexel University for 15 years, where she taught hydrology and also served as Associate Director of the School of Environmental Science, Engineering, and Policy. Dr. Welty is a member of NRC's Water Science and Technology Board and has previously served on three NRC study committees. She is the Chair-Elect of the Consortium of Universities for the Advancement of Hydrologic Science Inc. Dr. Welty received a B.A. in environmental sciences from the University of Virginia, an M.S. in environmental engineering from the George Washington University, and a Ph.D. degree in civil and environmental engineering from the Massachusetts Institute of Technology.

Lawrence E. Band

Member

Lawrence E. Band is Chair and Voit Gilmore Distinguished Professor of Geography at the University of North Carolina. His research interests are watershed hydrology, ecology, and geomorphology; GIS and remote sensing; and the structure, function and dynamics of watershed systems. Dr. Band combines field measurement and observation of hydrological and ecological variables with development and application of distributed simulation models, GIS and remote sensing techniques. His projects are particularly concerned with the integration and coupling between water, carbon and nutrient cycling and transport with watersheds, and the interactions of human behavior as part of watershed ecosystems. He is currently working in a range of watersheds within forested, agricultural, and urban environments. This encompasses a set of LTER sites, sites within and near Chapel Hill, NC, and the Baltimore Ecosystem Study. Previous work has included sites in northern Manitoba, central Saskatchewan, central Ontario, the Loess Plateau of northern China and the Pacific Northwest. He recently served on the NRC's Committee on Integrated Observations for Hydrologic and Related Sciences. He received a B.A. in geography from SUNY at Buffalo and a M.S. and Ph.D. in geography from UCLA.

Roger Bannerman

Member

Roger Bannerman has been an environmental specialist for the Wisconsin Department of Natural Resources for over 30 years. For most of that time he has directed research projects investigating urban runoff. Topics addressed by his studies over the years include the quality of urban streams, identification of problem pollutants in stormwater, toxicity of stormwater pollutants, effectiveness of different stormwater control practices, sources of stormwater pollutants, selection of cost-effective control practices, and benefits of low impact development. He has applied these results to management plans developed for most urban areas in Wisconsin. This includes the calibration of the urban runoff model called the Source Loading and Management Model. The results of his research projects have been used to develop Wisconsin's new administrative rules that regulate stormwater management. Mr. Bannerman received his B.S. in chemistry from Humboldt State College and an M.S. in water chemistry from the University of Wisconsin.

Derek B. Booth

Member

Derek B. Booth has joint positions as Senior Geologist at Stillwater Sciences, Inc., and Adjunct Professor at the University of Washington where he is senior editor of the international journal Quaternary Research and holds faculty appointments in Civil Engineering and Earth & Space Sciences. Prior to this, he was director of the Center for Urban Water Resources Management (and its successor, the Center for Water and Watershed Studies) at the university. He maintains active research into the causes of stream-channel degradation, the effectiveness of stormwater mitigation strategies, and the physical effects of urban development on aquatic systems, with over a dozen publications and a wide range of national and international invited presentations on the topic. Dr. Booth received a B.A. in literature from Hampshire College, a B.A. in geology from the University of California at Berkeley, an M.S. in geology from Stanford University, and a Ph.D. in geological sciences from the University of Washington.

Stanley B. Grant

Member

Stanley B. Grant is Professor of Environmental Engineering and Chair of the Department of Chemical Engineering and Materials Science at the University of California, Irvine. He studies the sources, fate, and transport of pathogens and indicator organisms in drinking water, urban runoff, and the coastal ocean. He is a member of EPA's Science Advisory Board (Drinking Water Panel) and is the lead on several multidisciplinary research projects, including one on the influence of tidal wetlands on coastal pollution, another on the association of pathogens and particles in storm runoff, and a third on the contribution of marinas to fecal indicator bacteria impairment in tidal embayments (in support of the Newport Bay Fecal Coliform TMDL). Dr. Grant was a recipient of the Career Award from the National Science Foundation (1985–2000), and a number of local awards including Conservator of the Year (2002) from the Bolsa Chica Wetlands Conservancy, and the Distinguished Assistant Professor Award for Teaching from the UCI Academic Senate. Dr. Grant received his B.S. in geology from Stanford, and his M.S. and Ph.D. in environmental engineering science from the California Institute of Technology.

Richard R. Horner

Member

Richard R. Horner is a professor in the Department of Civil and Environment Engineering at the University of Washington, with adjunct appointments in Landscape Architecture and in the College of Forest Resources' Center for Urban Horticulture. He received his Ph.D. from the University of Washington's Department of Civil and Environmental Engineering and previous engineering degrees from the University of Pennsylvania. Dr. Horner splits his time between university research and private practice. In both cases his work concerns how human occupancy of and activities on the landscape affect natural waters, and how negative effects can be reduced. He has been involved in two extended research projects concerning the ecological response of freshwater resources to urban conditions and the urbanization process. The first studied the effect of human activities on freshwater wetlands of the Puget Sound lowlands and led to a comprehensive set of management guidelines to reduce negative effects. A ten year study involved the analogous investigation of human effects on Puget Sounds' salmon spawning and rearing streams. In addition, he has broad experience in all aspects of stormwater management, having helped design many stormwater programs in Washington, California, and British Columbia. He previously served on the NRC's Committee on the Comparative Costs of Rock Salt and Calcium Magnesium Acetate for Highway Deicing.

Charles R. O'Melia

Member

Charles R. O'Melia (NAE) is the Abel Wolman Professor of Environmental Engineering and Chair of the Geography and Environmental Engineering Department at the Johns Hopkins University where he has served on the faculty for over twenty-five years. Dr. O'Melia's research areas include aquatic chemistry, environmental colloid chemistry, water and wastewater treatment, modeling of natural surface and subsurface waters, and the behavior of colloidal particles. He has served on the advisory board and review committees for the environmental engineering departments of multiple universities. He has served in a range of advising roles to professional societies including the American Water Works Association and Research Foundation, the Water Pollution Control Federation, the American Chemical Society, and the International Water Supply Association. He served the U.S. Environmental Protection Agency as a peer review panel member and on the science advisory board. Dr. O'Melia has also consulted for a variety of municipal, industrial, and governmental clients. In addition, he has served on several National Research Council (NRC) committees, including chairing the Steering Committee, Symposium on Science and Regulation, and the Committee on Watershed Management for New York City, which had a significant stormwater component. He was also a member of the NRC Water Science and Technology Board and the Board on Environmental Studies and Toxicology. Dr. O'Melia earned a Ph.D. in Sanitary Engineering from the University of Michigan. In 1989, Dr. O'Melia was elected to the National Academy of Engineering for significant contributions to the theories of coagulation, flocculation, and filtration leading to improved water-treatment practices throughout the world.

Robert E. Pitt

Member

Robert E. Pitt is the Cudworth Professor of Urban Water Systems in the Department of Civil, Construction, and Environmental Engineering at the University of Alabama. He is also Director of the UA interdisciplinary Environmental Institute. Prior to becoming an academician, he served as a private consultant and as an environmental engineer with the Wisconsin Department of Natural Resources. Dr. Pitt's research concerns the effects, sources, and control of urban runoff, which has resulted in numerous develop management plans, stormwater ordinances, and design manuals. Dr. Pitt has also developed and tested procedures to recognize and reduce inappropriate discharges of wastewaters to separate storm drainages. He has investigated the sources and control of stormwater toxicants and examined stormwater effects on groundwater. He has also carried out a number of receiving water impact studies associated with stormwater. These studies have included a variety of field monitoring activities, including water and sediment quality, fish and benthos taxonomic composition, and laboratory toxicity tests. His current research includes developing a nationwide database of national stormwater permit information and conducting comprehensive evaluations of these data. Dr. Pitt received a B.S. in engineering science from Humboldt State University, an M.S. in civil engineering from San Jose State University, and a Ph.D. in civil and environmental engineering from the University of Wisconsin.

Edward T. Rankin

Member

Edward T. Rankin is a Senior Research Associate in the Center for Applied Bioassessment and Biocriteria within the Midwest Biodiversity Institute and an Environmental Management Associate with Ohio University in Athens, Ohio. Prior to 2002, he was an aquatic ecologist with Ohio EPA for almost 18 years. MBI is a 125-member organization devoted to advancing the natural sciences, applied ecology, and field biology in 12 Midwestern states. Mr. Rankin's research centers around the effects of stormwater and other urban stressors on aquatic life, development and application of stream habitat assessment methodologies, development and application of biological criteria and biological-based chemical criteria for aquatic life, and improving the accuracy of TMDLs for nutrients and sediment. He is particularly interested in the application of research to management of aquatic life issues and has extensive experience with the development of tiered aquatic life uses and use attainability analyses in streams. He is currently participating in two studies funded by the Water Environment Research Foundation on urban stressors. Mr. Rankin received his B.S. in biology from St. Bonaventure University and his M.S. in zoology from The Ohio State University.

Thomas R. Schueler

Member

Thomas R. Schueler is Director of Watershed Research and Practice at the Center for Watershed Protection, which he founded in 1992 as a nonprofit organization dedicated to protecting our nation's streams, lakes and wetlands through improved land management. He has conducted extensive research on the pollutant removal performance, cost, and longevity of stormwater management practices, and he has developed guidance to assist both Phase I and II communities meet minimum management measures to comply with MS4 municipal stormwater permits, including development of a national stormwater monitoring database and national guidance on illicit discharge detection and elimination. Mr. Schueler developed the Impervious Cover Model to predict the degree of impact caused by watershed development and classify and manage urban streams. He has written several widely referenced manuals that describe how to apply the tools of watershed protection and restoration, and he is working on a wide range of research projects and watershed applications across the United States. Prior to founding the Center, he worked for ten years at the Metropolitan Washington Council of Governments, where he led the Anacostia Watershed Restoration Team, one of first efforts to comprehensively restore an urban watershed. He received his B.S. in environmental science from the George Washington University.

Kurt Stephenson

Member

Kurt Stephenson is an Associate Professor of Environmental and Natural Resource Economics in the Department of Agricultural and Applied Economics at the Virginia Polytechnic Institute and State University. His professional objective is to better integrate economic perspectives and analysis into decision-making related to water resource issues. Particular emphasis is placed on the application of economic analysis to interdisciplinary research of policy issues. The design and implementation of market-based policies to secure environmental objectives is a primary area of study within this context. He is currently involved in determining effective strategies for reducing nutrient loads in the Opequon Watershed in Virginia and West Virginia, including evaluating the cost effectiveness and feasibility of using urban nonpoint source controls (including stormwater management) as an offset to growth in point source loads. He is a member of the Virginia Department of Environmental Quality's Nutrient Trading Technical Advisory Committee and the Academic Advisory Committee. Dr. Stephenson received his B.S. in economics from Radford University, his M.S. in agricultural economics from Virginia Tech, and his Ph.D. in economics from the University of Nebraska.

Xavier Swamikannu

Member

Xavier Swamikannu is the Chief of the Stormwater Permitting Program for the Los Angeles Regional Water Board and the California EPA, where he has worked for over 15 years. He has extensive experience with municipal storm water programs in Southern California, including the evaluation of pollutant discharges, determining the effectiveness of BMPs in treating runoff, and better understanding the costs of implementing BMPs. In addition, he has been the State Project Manager responsible for evaluating and analyzing industrial storm water monitoring data since 2002, and has researched methods to improve compliance of industry with stormwater permits. He is a member of EPA's General Permits and Total Maximum Daily Load Work Group and he has sat on many state and regional technical advisory committees concerned with stormwater regulations. Dr. Swamikannu received his B.S. in natural and chemical sciences from St. Joseph's College in Bangalore, India, his M.S. in environmental sciences from Texas Christian University, and his Ph.D. in environmental science and engineering from the University of California, Los Angeles.

Robert G. Traver

Member

Robert G. Traver is an Associate Professor of Civil and Environmental Engineering at Villanova University and the Director of the Villanova Urban Stormwater Partnership. He conducts research on topics that include modeling of stream hydraulics, urban hydrology, water quality, and measures to mitigate stormwater effects of urbanization. Most recently he has created a Stormwater Best Management Practice Demonstration and Research Park on the Villanova Campus. Dr. Traver is also involved with the implementation of stormwater policy. He has participated in a team study to review the effects of Pennsylvania's water regulation from a watershed sustainability viewpoint, acted as a reviewer for Pennsylvania's 1995 BMP Handbook, and has served as Chair for the 1998, 1999, 2001, 2003, and 2005 Pennsylvania Stormwater Management Symposia held at Villanova. As of August 2003 he has been appointed by the Commonwealth to the oversight committee for Pennsylvania's "new" BMP manual. More recently he was selected to serve on ASCE's External Review Panel of the Corps investigation of Hurricane Katrina. In 2006, he was awarded the Schuylkill Action Network Education Award and the Water Resources Association of the Delaware River Basin Ruth Patrick Education Award. Dr. Traver is a retired LTC in the Army Reserves and a veteran of Operation Desert Storm. He received his B.S. in civil engineering from the Virginia Military Institute, his M.S. in civil engineering from Villanova, and his Ph.D. in civil engineering from Penn State.

Wendy E. Wagner

Member

Wendy Wagner is the Joe A. Worsham Centennial Professor at the University of Texas School of Law. Before joining the UT faculty, Wagner was a professor at Case Western Reserve University School of Law and a visiting professor at Columbia Law School and the Vanderbilt School of Law. Wagner's research focuses on the interface between science and environmental law, and her articles have appeared in numerous journals, including the Columbia, Cornell, Duke, Georgetown, Illinois, Texas, Wisconsin, and Yale Law Reviews. With respect to stormwater regulation, Wagner has published on the practical problems with EPA's current approach to stormwater regulation. She has also written several articles on the challenges of regulating media like stormwater; on restoring polluted waters with public values; on the legal aspects of the regulatory use of environmental modeling; and on technology-based standards. Wagner received a master's degree in environmental studies from the Yale School of Forestry and Environmental Studies and a law degree from Yale Law School. She clerked for the Honorable Judge Albert Engel, Chief Judge of the U.S. Court of Appeals for the 6th Circuit.

William E. Wenk

Member

William E. Wenk is founder and President of Wenk Associates, Inc., a Denver-based landscape architectural firm. He is also an Adjunct Associate Professor of Landscape Architecture at University of Colorado in Denver. For over 20 years, he has been influential in the restoration and redevelopment of urban river and stream corridors, the transformation of derelict urban land, and the design of public parks and open spaces. Mr. Wenk was the Principal Urban Designer for the Menomonee River Valley Redevelopment, an award-winning “green infrastructure” redevelopment in Milwaukee that integrated a network of parks and open spaces through stormwater infrastructure, regional and local trails, and a restored river corridor into a proposed 130-acre mixed-use and light industrial development. Other projects of his include the Prairie Trail Community Master Plan in Ankeny, Iowa—a surface stormwater system designed to provide flood control and water quality for a new 1000-acre mixed-use community—and the Stapleton Airport Parks and Open Space Redevelopment—a surface stormwater drainage design for the 4,500-acre redevelopment as well as the Stapleton Water Quality Guidelines pattern book to guide planners and developers to integrate storm drainage best management practices. Mr. Wenk is also serving as the Principal River Planner for the restoration of the Los Angeles River and a mixed-use development and stream restoration for Bubbly Creek, a branch of the Chicago River in Chicago. He received a B.S.L.A. and the M.L.A. from Michigan State University and the University of Oregon, respectively.