Georgia's State Water Plan

# Scientific and Engineering Advisory Panel
# Biographical Sketches

## David Allan

David Allan received a Bachelor of Science degree (with honors) in Zoology from the University of British Columbia in 1966, and Master of Science and Doctoral degrees in Zoology from the University of Michigan in 1967 and 1971, respectively. He was a Post-Doctoral Fellow in the Department of Biology at the University of Chicago before joining the Department of Zoology at the University of Maryland, College Park, where from 1972 to 1990, he served as Professor and Director of Graduate Studies. In 1990, Professor Allan joined the School of Natural Resources (later to be renamed School of Natural Resources and Environment), where he was appointed Associate Dean for Academic Affairs in 2007 and Acting Dean in 2008.

Professor Allan's teaching interests are in the ecology of fresh waters, including their conservation, management, and restoration. He also helps lead interdisciplinary, team-taught courses and a University of Michigan academic minor on Global Environmental Change. He is the author of two widely used text books: Stream Ecology (2007, with M.M Castillo) and Streams: Their Ecology & Life (2001, with C.E. Cushing). Professor Allan's current research investigates the influence of changing land use on river ecosystems, the factors affecting success of stream restoration, and the ecology of freshwater communities. In addition to both local and regional work centered in the Midwest, his research has taken place at sites in the Rocky Mountains, Southeast Alaska, Sweden, Israel, and Venezuela.

Professor Allan's conservation activities include working closely with local watershed councils, and he has served on the boards of American Rivers and the Michigan Chapter of The Nature Conservancy. He has frequently served as a consultant to the U.S. Environmental Protection Agency and other agencies on topics related to aquatic ecosystem health. Professor Allan is active professionally on many fronts and has held office in several professional societies, including the North American Benthological Society, the Society for Conservation Biology, and the Ecological Society of America. He is a Fellow of the American Association for the Advancement of Science and 2009 recipient of the Award of Excellence of the North American Benthological Society.

## Bruce Beck

M Bruce Beck is Professor and Eminent Scholar in the Warnell School of Forestry and Natural Resources at the University of Georgia, where he holds the Wheatley-Georgia Research Alliance Endowed Chair in Water Quality and Environmental Systems. He is also an Institute Scholar at the International Institute for Applied Systems Analysis (Laxenburg, Austria) and Visiting Professor and Senior Research Associate in the Department of Civil and Environmental Engineering at Imperial College in London. Dr. Beck holds a first degree in Chemical Engineering from the University of Exeter (1970) and a PhD in Control Engineering from the University of Cambridge (1973). He has been a Visiting Scientist at the US Environmental Protection Agency (1990-94) and a Visiting Scholar at the Isaac Newton Institute for Mathematical Sciences in Cambridge (1998). From 1993 through 1998 he led the International Task Force on Forecasting Environmental Change. The book *Environmental Foresight and Models: A Manifesto* was published in 2002 as the outcome of the Task Force. Dr. Beck has directed the Sustainability Initiative of the International Water Association (IWA) since its inception in 2001. He has just completed a White Paper for the US NSF on *Grand Challenges of*

*the Future for Environmental Modeling*, likewise a Concepts Paper on *Sustainability* for the IWA, and will shortly be completing a second White Paper for NSF and EPA on *Handling Uncertainty in Models at the Science-Policy Interface*. In December 2008 he joined the Advisory Board of Avenir Global Investment Advisors (Geneva). Beck's research on water resources in Georgia has previously focused on real-time monitoring of water quality and the development of concepts of adaptive community learning in respect of the long-term ecological integrity of Lake Lanier. Current research is examining strategies for re-engineering Atlanta's water and wastewater infrastructure, such that the city may become a "force for good" in the Chattahoochee watershed

**Mary Freeman**

Mary Freeman is a Research Ecologist with the U.S. Geological Survey's Patuxent Wildlife Research Center. Dr. Freeman is stationed in Athens, GA, where she also serves on the graduate faculty of the University of Georgia and is adjunct faculty in the Odum School of Ecology. She conducts research on streams and rivers to provide information to resource managers and others concerned with issues such as how dam operations, water management, land use and climate change may affect freshwater biota. She has collaborated with university, agency and student colleagues on over 50 published studies primarily addressing the diversity, distribution and abundance of stream fishes and invertebrates in relation to natural and human-caused changes in stream habitats. Her current studies include measuring effects of low stream flows on invertebrate and fish survival in streams, estimating distribution trends in rare and imperiled stream fishes, and developing methods that decision-makers can use to compare alternative management actions with respect to effects on aquatic biodiversity. Dr. Freeman holds B.S. (1979, Biology), M.S. (1982, Entomology) and Ph.D. (1990, Forest Resources) degrees from the University of Georgia.

**Aris Georgakakos**

Aris P. Georgakakos holds a civil engineering Diploma from the National Technical University of Athens, Greece, and Masters and Ph. D. degrees in water resources from the Massachusetts Institute of Technology. Dr. Georgakakos is currently a Professor at the School of Civil and Environmental Engineering at Georgia Tech, Head of the Environmental Fluid Mechanics and Water Resources Program, and Director of the Georgia Water Resources Institute. Dr. Georgakakos' research and technology transfer activities aim to develop and implement prototypical information and decision support systems for integrated water resources assessment, development, and management. These systems combine data from conventional and remote sources, GIS, and models from various scientific and engineering disciplines (including climate, hydrology, agricultural science, water resources, wetland and river ecology, hydro-thermal power systems, economics, statistics, and operations research). Dr. Georgakakos has been involved in several world regions and his decision support systems are currently used for river basin planning and management in Georgia and the southeast US, California, East Africa, Brazil, Jordan, Greece, and China. His research has been sponsored by U.S. and foreign organizations including the US Geological Survey, US Army Corps of Engineers, National Oceanic and Atmospheric Administration, National Science Foundation, Environmental Protection Agency, Food and Agriculture Organization of the United Nations, World Bank, US and European International Development Agencies, and several domestic and foreign electrical utilities. Dr. Georgakakos has published extensively and is currently an Associate Editor for the Advances in Water Resources Journal and the Journal of Hydrology. Dr. Georgakakos has

recently been appointed an Extraordinary Professor at the University of Pretoria, South Africa, and is co-director of the AWARE Masters program, a graduate water resources program offered jointly by Georgia Tech and the University of Pretoria.

**Wendy Graham**

Wendy D. Graham is the Carl S. Swisher Eminent Scholar in Water Resources in the Department of Agricultural and Biological Engineering at the University of Florida and Director of the University of Florida Water Institute. She graduated from the University of Florida with a Bachelor's degree in Environmental Engineering. Her PhD is in Civil Engineering from the Massachusetts Institute of Technology. She conducts research in the areas of coupled hydrologic-water quality- ecosystem modeling; water resources evaluation and remediation; evaluation of impacts of agricultural production on surface and groundwater quality; development of hydrologic indicators of ecosystem status; stochastic modeling and data assimilation. She has served as PI or co-PI on over $13 million in grants and contracts, has supervised 30 doctoral and master's thesis committees and has served on an additional 45 graduate student committees.

Graham is the recipient of numerous honors, including the Editors' Citation for Excellence in Reviewing for Water Resources Research from the American Geophysical Union; the Emerging Scholar Award from the American Association of University Women; the Young Engineer Award from the Florida Section of the American Association of Agricultural Engineering; the Gamma Sigma Delta Junior Faculty Award of Merit, the Sigma Xi Junior Faculty Research Award, the University of Florida Research Foundation Professorship Award, the University of Florida Doctoral Advising/Mentoring Award, the Florida Section of the American Association of Agricultural and Biological Engineers Distinguished Achievement Award, and the Gamma Sigma Delta Distinguished Leadership Award of Merit.

Dr. Graham has served as Chair of the Board of Directors for the Consortium of Universities for the Advancement of Hydrologic Science, a member of the ASAE Board of Trustees, and a member of the Florida's Pesticide Review Council. She also served as secretary of the American Geophysical Union's hydrology section; associate editor for Water Resources Research, Advances in Water Resources and the Journal of Contaminant Hydrology; Chair of the Florida section of the American Society of Agricultural Engineers; Chair of the modeling subcommittee of the International Life Sciences Institute working group on the estimation of pesticide concentrations in drinking water; and member of the American Society of Civil Engineers' task committee on stochastic methods in subsurface contaminant hydrology. She currently serves as a member of the National Research Council's Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP) and of the Georgia Department of Natural Resources State Water Plan Scientific and Engineering Advisory Council.

**James Greenfield**

James M. Greenfield is currently a Senior Water Quality Modeler and National TMDL Technical Expert with the U.S. Environmental Protection Agency Region 4 Office in Atlanta, Georgia. He has a Bachelor of Engineering from Calvin College in Grand Rapids, Michigan and a Master of Environmental Engineer in Water Resources from the University of Michigan in Ann Arbor, Michigan

Mr. Greenfield has twenty nine years of experience with EPA Region 4 in the Water Program. Prior to joining EPA, Mr. Greenfield worked for 4 years at Georgia EPD working in the modeling, wasteload allocation and TMDL arena. He have worked on hundreds of TMDL and Modeling projects in the South. Major projects include Savannah Harbor TMDL development and harbor deepening assessment; Tri-State "water wars" technical liaison; Charleston Harbor modeling and NPDES permit limit development and overall technical modeling and TMDL assistance to the Region 4 States. I was part of the National TMDL workgroup that developed the initial implementation regulation and guidance for TMDL implementation in the Nation.

In 1993 and 1994, Mr. Greenfield was assigned to two missions to Belarus (former USSR State) to assist the World Bank in their Environmental Mission. From 1994 to 1998, he was assigned to work on developing water quality management experience for the Ukraine Ministry of Environment. He trained Ukrainian specialists to collect appropriate water quality samples to assess the Kaniv Reservoir near Kiev. He developed a Water Quality model of the Kaniv reservoir that was used in developing a comprehensive plan for protecting the recreational and fisheries aspects of the Kaniv Reservoir. From 1998 to 2005, he continued the Ukrainian training by heading a joint study of the Dnipro Estuary and the near shore area of the Black Sea which included two years of data collection and the development of a hydrodynamic and water quality model for the Dnipro Estuary and a portion of the Black Sea.

## Todd Rasmussen

Todd Rasmussen received his B.S. degree (1976) at the University of California, Berkeley, in Natural Resource Management. Between 1976-1979 he worked as a Peace Corps Volunteer in Honduras on watershed protection projects. He returned to complete an M.S. (1982) and Ph.D. (1988) degree in the Department of Hydrology & Water Resources at the University of Arizona, Tucson, where his research focused on flow and transport in fractured rock related to waste disposal.

Since coming to the University of Georgia in 1992, Dr. Rasmussen has taught a wide range of water resources classes, including Soils and Hydrology, Hydrologic Modeling, Aquifer Mechanics, Quantitative Methods in Hydrology, Field Methods in Hydrology, and the Hydrology, Geology, and Soils of Georgia. He has been instrumental in establishing the UGA Water Resources Faculty, a collaborative effort of over 70 faculty from over a dozen academic units on campus. He is also a co-organizer of the Georgia Water Resources Conference.

Dr. Rasmussen's research focuses on fluid flow and contaminant transport through surface and subsurface environments, focusing on the physical, chemical, mathematical, and statistical description and quantification of hydrologic processes. Current research projects include basin-scale models of flow and transport, characterization and evaluation of lake eutrophication, linkages between energy production and water resources, and evaluating the impacts of development and climate change at the watershed scale.

## Kenneth Reckhow

Kenneth H. Reckhow is a professor at Duke University with faculty appointments in the School of the Environment and the Department of Civil and Environmental Engineering. From 1996 to 2004 he served, on a part-time basis, as Director of the University of North Carolina Water Resources Research Institute. He is a past president of the National Institutes for Water Resources, past President of the North American Lake Management Society, and past Chair of

the North Carolina Sedimentation Control Commission. Dr. Reckhow served as Chair of National Academy of Sciences Panel on the USEPA Total Maximum Daily Load Program (2001), as a member of the National Academy of Sciences Panel on USGS National Water Quality Assessment (2000-01), and as a member of the National Academy of Sciences Panel on Restoration of the Everglades Ecosystem (2003-05). He is currently Chair of the National Academy of Sciences Panel on the Evaluation of Chesapeake Bay Progress Implementation for Nutrient Reduction to Improve Water Quality (2009-2011). He has published two books and over 100 papers, principally on statistical and probabilistic water quality modeling, uncertainty and decision analysis, and pollutant loading assessment. In addition, Dr. Reckhow has taught several short courses on water quality modeling and monitoring design, and he has written eight technical guidance manuals on water quality modeling. He is now serving, or has previously served, on the editorial boards of *Water Resources Research, Water Resources Bulletin, Lake and Reservoir Management, Journal of Environmental Statistics, Urban Ecosystems, and Risk Analysis.* He received a B.S. in engineering physics from Cornell University in 1971 and a Ph.D. from Harvard University in environmental systems analysis in 1977.

**Brian Richter**

Brian Richter has been involved in river science and conservation for more than 20 years. He is the Managing Director of The Nature Conservancy's Global Freshwater Program, a program that promotes sustainable water management with governments, corporations, and local communities. Dr. Richter has consulted on more than 120 river projects worldwide, with a focus on the challenge of meeting human needs for water and energy while sustaining healthy rivers and lakes. He has developed numerous scientific tools and methods to support river protection and restoration efforts, including the *Indicators of Hydrologic Alteration* software that is being used by water managers and ecologists worldwide. He has published many scientific papers on the importance of ecologically sustainable water management in international science journals, and co-authored a book with Sandra Postel entitled *"Rivers for Life: Managing Water for People and Nature*" (Island Press, 2003).

**Seth Rose**

Seth Rose is an Associate Professor in the Department of Geosciences at Georgia State University in Atlanta, Georgia and a registered Professional Geologist in Georgia. He has taught and researched here for the past 22 years after receiving B.S. degrees from Florida State and Florida International Universities, an M.S. Degree in Geology from the University of Florida and a Ph.D. Degree in Geosciences from the the University of Arizona. He routinely supervises graduate student research and teaches undergraduate and graduate courses in Introductory Geology, Hydrogeology, and Aqueous Geochemistry. His research interests are varied (i.e. he is a generalist rather than a specialist) but tend to focus upon a better understanding of hydrological and hydrogeochemical processes within the southeastern Piedmont Province of the United States, particularly Georgia. He has published 30 peer-reviewed journal papers, encyclopedia articles, and book chapters. Dr. Rose's earlier research in Georgia was focused upon how to use environmental tritium to age-date ground water in Piedmont Province base flow and bedrock aquifers. He has published extensively on the effects of urbanization upon surface water systems (particularly base flow) within the Atlanta Metropolitan Region. Presently Dr. Rose's research involves developing methodologies to assess the effects of antecedent rainfall (i.e. "memory effects") upon subsequent runoff and uses the southeastern Piedmont Province as its study area. His research has been funded by Georgia State University, the Georgia Department of Natural Resources, the Georgia Water Resources Institute, and the

National Science Foundation. Dr. Rose has served upon numerous technical review panels for the Georgia Department of Natural Resources.

**Amy Rosemond**

Amy Rosemond teaches about river and lake ecosystems at the University of Georgia. Dr. Rosemond's teaching is informed by over two decades of broad-ranging research on aquatic ecosystems, focusing on the effects of anthropogenic change on aquatic food webs. She has collaborated with other scientists to understand aquatic systems, from microorganisms to mammals, and has contributed most significantly to understanding how nutrients move through and affect food webs, from headwater streams to coastal zones. Dr. Rosemond has over 40 peer-reviewed publications and has trained a significant number of students and postdoctoral associates who hold positions in academic institutions, state and federal agencies and non-profit organizations. She has received funding from the U.S. National Science Foundation and U.S. Environmental Protection Agency in support of her work.