Invitation for Comments on the "Short List" Candidates for the EPA Science Advisory Board, Aquatic Life Criteria Guidelines Advisory Panel

The EPA Science Advisory Board (SAB) Staff Office announced in a *Federal Register* Notice (Volume 70, Number 30; Pages 7734 – 7735) that it sought public nominations of individuals to conduct a consultation on EPA's framework for revising the Guidelines for Derivation of Ambient Water Quality Criteria for the Protection of Aquatic Life (the Guidelines). The SAB Staff Office sought public nominations of individuals with related expertise in the following areas: aquatic toxicology, particularly kinetic toxicity modeling and tissue residue-based toxicity data and residue-response relationships; biology of aquatic and benthic species; bioaccumulation modeling, including both simple bioaccumulation factors and complex dynamic food web/food chain models; and population modeling. Background information on the project and details on the nomination process appeared in the cited notice. The notice is available on the SAB Website at www.epa.gov/sab/.

Based on relevant qualifications and interest of the nominees, the SAB Staff Office identified the "Short List" of nominees. Brief biographical sketches of the candidates on the "Short List" are provided below for comment. Following an initial SAB consultation, EPA may seek future advice from the SAB as the Guidelines are revised. The SAB Staff Office plans to select candidates from this "Short List" to form a panel for the initial consultation on EPA's framework for revising the Guidelines as well as other future panels that may provide additional advice and peer review to EPA as the Guidelines are revised. We welcome information, analysis or documentation for the Staff Office to consider in evaluating the "Short List" candidates.

The SAB Staff Office Director, in consultation with SAB leadership, as appropriate, makes the final decision about who will serve on the panel in the "Panel Selection" phase of this process. In that phase, the SAB Staff completes its review of information regarding conflict of interest, possible appearance of impartiality, and appropriate balance and breadth of expertise needed to address the charge. Staff reviews all information provided by candidates, along with any information that the public may provide in response to the posting of information about the prospective panel on the SAB Website during the "Short List" phase, and information gathered by SAB Staff independently on the background of each candidate.

Please provide any comments you may have with respect to the "Short List" candidates, no later than June 15, 2005. Please make your comments to the attention of Dr. Thomas Armitage, Designated Federal Officer. Emailing comments (armitage.thomas@epa.gov) is the preferred mode of receipt.

Aquatic Life Criteria Guidelines Advisory Panel

William Adams

Dr. William Adams is currently Principal Environmental Scientist for Rio Tinto, Salt Lake City, Utah. His responsibilities include directing environmental research, managing product stewardship programs, performing ecological risk assessments and interfacing with national and international regulators on science-based issues. Dr. Adams' areas of research interest focus on ecotoxicology, environmental risk assessment, hazard assessment of metals, sediment assessment methodologies and bioaccumulation models for aquatic ecosystems with a focus on metals. The January 2005 issue of Environmental Toxicology and Chemistry includes two articles by Dr. Adams and co-authors on bioaccumulation and predictive models for selenium. He has published 75 papers in these areas and has authored several books and/or book chapters. Dr. Adams served on the EPA Science Advisory Board Ecological Processes and Effects Board Committee for eight years and on two SAB subcommittees. Additionally, he has served on the National Marine Board committees reviewing sediment assessment and on numerous technical peer review committees and technical workshop committees. Dr. Adams also served on the EPA Superfund NACEPT Committee in 2003 and 2004. Dr. Adams' educational background is as follows: B.S. Biological Sciences (cum laude) 1969; Lake Superior State University, Sault Ste Marie, MI; M.S. Wildlife Toxicology - 1971 Michigan State University, E. Lansing, MI; Ph.D. Aquatic Toxicology - 1976 Michigan State University, East Lansing, MI.

Todd Bridges

Dr. Todd Bridges is the Director of the Center for Contaminated Sediments (CCS) at the U.S. Army Engineer Research and Development Center. Dr. Bridges has more than 10 years of experience as a research scientist with the U.S. Army Corps of Engineers (USACE). His primary areas of research activity concern the bioavailability and toxicology of sediment-associated contaminants and the development of methods and models for use in risk assessment. His research projects have included investigating the nature of chronic and sublethal toxicity in freshwater and marine organisms, designing chronic bioassays for regulatory programs and site investigations, developing population models as assessment tools, and developing and applying food web models and quantitative uncertainty analysis methods in risk assessment. His research projects have been supported by programs within the USACE, the U.S. Navy, the U.S. Department of Defense, the U.S. Environmental Protection Agency, The National Oceanic and Atmospheric Administration, and the private sector. His research activities have been recognized through receipt of several USACE and U.S. Army research and development awards. In addition to his basic and applied research activities, Dr. Bridges has also lead and been a team member on numerous sediment/site assessments. As a Focus Area Manager within the Dredging Operations Environmental Research (DOER) program, the Corps largest civil works research and development program, Dr. Bridges manages more than $1.5 million in research in contaminated sediment assessment and management. He currently chairs international working groups within the Scientific Group of the London Convention and the International Navigation Association that are tasked with crafting guidance for assessing contaminated sediments. Dr. Bridges has served on the Editorial Board of *Environmental Toxicology and Chemistry* and is an active member of several professional organizations. Over the last 10 years Dr. Bridges has published more than 20 journal articles and book chapters and numerous reports for project sponsors. In his current position as Director of the CCS, Dr. Bridges works to advance the development of innovative technologies and sound policy, regulation, and guidance concerned with contaminated sediment. He received his B.A. (1985) and M.A. (1988) in Biology/Zoology from California State University, Fresno and his Ph.D. (1992) in Biological Oceanography at North Carolina State University.

John Connolly

Dr. John Connolly began his career at Manhattan College in 1975 after receiving bachelor and master degrees in Civil and Environmental Engineering from that institution. He received a Ph.D. from the University of Texas at Austin in 1980. He has conducted research and consulted in the areas of contaminant transport and bioaccumulation. He worked for the U.S. EPA in the late 1970s while pursuing his Ph.D., was a faculty member at Manhattan College for 14 years, a partner at HydroQual, Inc. for 5 years and since 1998 has been the President of Quantitative Environmental Analysis, LLC. He working on development of the mathematical model used by the U.S. and Canada as a basis for nutrient control policies in the Lake Erie watershed. He has conducted in research in several areas, including toxic chemical fate, bioaccumulation, carbon cycling and the environmental and the fate of genetically engineered microorganisms. While working on more than 30 projects in the areas of contaminant transport and bioaccumulation directed to exposure assessment and risk assessment related to surface water and groundwater contamination, he has been in been involved in field sampling, fine grained sediment transport analysis, chemical fate modeling and food web bioaccumulation modeling. He was selected by eminence to be a Diplomate in the American Academy of Environmental Engineers. He has testified before Congress on contaminated sediment issues and is currently one of three national experts reviewing the EPA Contaminated Sediment Remediation Guidance.

Lawrence Curtis

Dr. Lawrence R. Curtis has served as Professor and Department Head of the Department of Environmental and Molecular Toxicology at Oregon State University in Corvallis, Oregon since 1999. Dr. Curtis earned his Ph.D. in Pharmacology and Toxicology from the University of Mississippi Medical Center in 1980 and his B.S. (1974) and M.Sc. (1977) from the University of South Alabama; in conjunction with the Marine Environmental Sciences Consortium, Dauphin Island, Alabama. In 1987 Dr. Curtis was awarded the Savery Outstanding Young Faculty Award by the College of Agricultural Sciences at Oregon State University and the Lucille P. Markey Summer Research Fellowship from The Mount Desert Island Biological Laboratory in Salsbury Cove, Maine. After fifteen years of affiliation with Oregon State University's Fisheries and Wildlife Department, Dr. Curtis spent four years as Professor and Chair of the Department of Environmental Health at East Tennessee State University, and Adjunct Professor of Pharmacology at the Quillen College of Medicine, before returning to Oregon State University. He has also served as a consultant on the Battelle Memorial Institute Pacific Northwest Division, Environmental Technology Directorate Review Committee since 2002. Throughout his career he has been a member of many professional organizations including the Society of Environmental Toxicology and Chemistry, the Society of Toxicology, the American Society for Pharmacology and Experimental Therapeutics. In addition to these memberships Dr. Curtis served as Chairperson of the Session on "Environmental Toxicology," at the Second Annual Meeting of Pacific and Northwest Association of Toxicologists (1985); Chairperson of the Session on "Aquatic Toxicology," at the Twenty-fifth Annual Meeting of Society of Toxicology (1986); Vice President of the Pacific Northwest Chapter of Society of Toxicology (1987); Chairperson of the Session on "Aquatic and Environmental Toxicology" at the Twenty-eighth Annual Meeting of Society of Toxicology (1989); Chair person of the Session on "Aquatic Toxicology" at the Thirtieth Annual Meeting of Society of Toxicology (1991); Chairperson of the Session on "Responses of Aquatic Animals to Environmental Toxicants" at the Thirty-first Annual Meeting of Society of Toxicology (1992); Member of the Continuing Education Committee, Society of Toxicology (1992-1996); President of the Pacific Northwest Chapter of Society of Toxicology (1994); Counselor of the Southeastern Chapter of the Society of Toxicology (1996-1999); Member of the Membership Committee, Society of Toxicology (1997-2000); Chair of the Membership Committee, Society of Toxicology (1999-2000); Member of the Review Committee, Biosolids applied to land: advancing standards and practices, The National Research Council (2001-2002); and Member of the Education Committee, Society of Toxicology (2005-2007). The general objective of Dr. Curtis' research is to increase understanding of cellular level processes that determine bioaccumulation of persistent environmental contaminants. The role of binding proteins that traffic fat soluble xenobiotics within liver cells is of special interest. Dr. Curtis' recent sources of funding include the Oregon Department of Agriculture, the Oregon Watershed Enhancement Board, Pilot project from Oregon State University; Marine Freshwater Biomedical Science Center; and National Institute of Environmental Health Sciences, National Institute of Environmental Health Sciences, and the Kellogg Foundation.

Kenneth Dickson

Dr. Kenneth Dickson received a B.S. in Education and M.S. in Biology from North Texas State University. He received his Ph.D. in zoology from Virginia Polytechnic Institute and State University (VPI) in 1971. He was a faculty member in Biological Sciences at VPI from 1970 to 1978 serving as Assistant Director of the Center for Environmental Studies and Assistant and subsequently Associate Professor of Biological Sciences. In 1978 Dr. Dickson returned to University of North Texas (UNT) as a Research Scientist in the Institute of Applied Sciences (IAS). He became Director of IAS in 1979 and Professor of Biological Sciences. He directed the IAS until 1999. He was appointed a Regents Professor in 1989. In 1998 Dr. Dickson created the Elm Fork Education Center and serves as the Director. His research interest includes: the fate and effects of chemicals in the aquatic environment, water quality, ecotoxicology, environmental education and sustainability. He is a past president of the Society of Environmental Toxicology and Chemistry and the Texas Academy of Science. Dr. Dickson currently serves on the U.S. EPA Science Advisory Board. He served two years on the Department of Defense's Strategic Environmental Research Development Program, Science Advisory Committee. He is recipient of UNT's Regents Faculty Lecturer Award in 1989, President's Award, Ursala Smith Spirit Award and the Community Award. He is author of over 150 technical publications on a variety of environmental topics.

Philip Dorn

Dr. Philip Dorn is a principal scientist employed at Shell Global Solutions (US), Inc., Westhollow Technology Center in Houston, Texas. He has spent 23 1/2 years in this organization and has conducted research and applied problem solving in environmental toxicology and ecological risk assessment. His research has covered projects ranging from fate and effects of Shell products in the environment, chemicals and refinery effluents, to major site ecological risk assessment and remediation. He has traveled extensively into the Brazilian Amazon co-leading research and teaching trips on the Amazon and Rio Negro Rivers. He has more than 60 peer review publications in ecotoxicology, and has led the petroleum industry through trade association work with the American Petroleum Institute in water quality issues, especially whole effluent toxicity, water quality criteria and sediment contamination. He has been a consultant to the USEPA Science Advisory Board since 1994. He has held adjunct faculty positions at the University of Mississippi, Clemson University and University of Houston – Clear Lake. He served until 2002 for 10 years on the Texas A&M University College of Science Development Board. He recently completed a 6-year term on the Water Environment Federation Research Council. Dr. Dorn's research interests include: ecological risk assessment/water quality criteria; drilling fluids (synthetics) and produced water; rain forest ecology; product/chemical risk assessment and environmental safety; environmental toxicology; and constructed wetlands technology.

Robbin Finch

Mr. Robbin Finch is Water Quality Manager, Boise City Public Works. Mr. Finch received a B.S. in Education/Geology from the University of Wisconsin-Oshkosh, 1977; an M.S. in Geology from Eastern Washington University, 1989. Mr. Finch has nineteen years of work experience including wastewater and receiving stream sampling and monitoring; industrial pretreatment program implementation; National Pollution Discharge Elimination System (NPDES) permitting; water quality-based facilities planning; watershed monitoring and assessment; Total maximum Daily Load (TMDL) development and implementation; use attainability analyses; and water quality standards development. Mr. Finch's experience includes: (1) Municipal representative on negotiated rulemaking committee for methylmercury and other metals criteria. (2) Project manager for $1 million water quality study/modeling of Brownlee Reservoir and the Idaho municipal representative for joint Idaho /Oregon Snake River-Hells Canyon TMDL Public Advisory Team. (3) Water Environment Research Foundation (WERF) TMDL Assessment Project Sub-committee member; (4) Project manager for Lead and Copper Water Effects Ratio (WER) Study for the Boise River; (5) Project manager for Lower Boise River Temperature monitoring and model development.

Carol Folt

Dr. Carol Folt is Professor of Biological Sciences and Dean of the Faculty of Arts and Sciences at Dartmouth College. She has a Ph.D. in Ecology, an M.A. in Biology and a B.A. in Aquatic Biology. She started at Dartmouth in 1983 as an assistant professor of biological sciences following graduate research in environmental biology and ecology at the University of California, Davis, and a postdoctoral fellowship at W.K. Kellogg Biological Station of Michigan State University. An aquatic environmental scientist, she has published more than 50 articles, a book and edited volume, and has received numerous grants from the National Science Foundation (NSF) and the National Institute of Environmental Health Sciences (NIEHS). Her research interest is aquatic ecology, and her current research focuses on four topics: the relationship between food web structure and metal accumulation and biomagnification; the restoration of Atlantic salmon; the biological mechanisms for and consequences of plankton patchiness; and information-gathering and decision-making in animal behavior. She also directs Environmental Detectives, a collaborative science education project being developed by the Montshire Museum in Norwich, Vermont, and the Center for Environmental Health Sciences at Dartmouth. She has served on numerous NSF review panels and on the editorial boards of various scholarly journals in her field, as well as in elected positions in the Ecological Society of America and the American Society of Limnology and Oceanography. She was appointed dean of graduate studies in 2001 and is currently also the associate director of the Center for Environmental Health Sciences and of the Dartmouth Toxic Metals Research Program. She was awarded the J. Kenneth Huntington Memorial Prize for Teaching in 1991 and has advised more than 100 undergraduate and graduate students in her laboratory. She played a critical role in the founding and development of the Women in Science Project, which encourages undergraduate women to major in the sciences. In addition, she served as a trustee for the Montshire Museum of Science for six years and is the first-year lecturer for the incoming Class of 2008.

Robert Gensemer

Dr. Robert Gensemer is a Senior Toxicologist and Division Manager at the Parametrix Environmental Research Laboratory in Albany, Oregon. He received his Ph.D. in 1989 from the University of Michigan in Biological Sciences with a specialization in Limnology, and his B.A. in 1982 from Ohio Wesleyan University in Botany and Microbiology. Before joining Parametrix, he was a Senior Ecotoxicologist at ENSR's Fort Collins Environmental Toxicology Laboratory, and before that was an assistant professor at Boston University in the Biology and Environmental Studies departments. Dr. Gensemer's project experience includes reviewing and conducting site-specific water quality criteria modifications (chiefly for metals), the development and revision of ambient water quality criteria (e.g., MTBE and cyanide), aquatic plant toxicology, and conducting ecological risk assessments. Of particular recent interest has been the development or modification of ambient water quality criteria for protection of aquatic life in effluent-dependent and ephemeral waters in arid western regions of the U.S. (sponsored by the Arid West Water Quality Research Program, Pima County, AZ). As a result of this work, Dr. Gensemer has presented study results and implications to the Western States Water Council (Western Governors Association), the Western Coalition of Arid States (WESTCAS), and was invited to participate in a U.S. EPA National Symposium on "Designating Attainable Uses for the Nation's Waters" (June 2002). Dr. Gensemer also recently participated in a symposium sponsored by the Water Environment Research Foundation (WERF), "Looking to the Future by Reevaluating Water Quality Criteria Now." Current research sponsors include Pima County, AZ, WERF, the Colorado Wastewater Utility Council, the Sanitation Districts of Los Angeles County, USEPA Region 10, and the U.S. Sea Grant program. Dr. Gensemer is an active member of the Society of Environmental Toxicology and Chemistry (SETAC) in which he was the first North American editor and is now the Editor-in-Chief of the society's international newsletter, the *SETAC Globe*. He also served for three years on the editorial board of *Environmental Toxicology and Chemistry*, chaired the implementation committee responsible for the development of SETAC's new journal, *Integrated Environmental Assessment and Management*, and is currently a member of the board of directors for the Pacific Northwest Chapter of SETAC. While living in Boston, Dr. Gensemer also served as a member of the Barnstable County Scientific Advisory Board regarding the Massachusetts Military Reservation CERCLA site risk assessments, has reviewed research proposals for the National Sciences and Engineering Research Council of Canada, and has served as a peer reviewer for numerous international journals.

Jeffrey Giddings

Dr. Jeffrey Giddings is a Senior Consultant and Program Leader with the Parametrix Environmental Research Laboratory in Albany, OR; he operates a satellite office in Rochester, MA. Dr. Giddings holds an A.B. in Biology and a Ph.D. in Aquatic Ecology, both from Cornell University. His current work focuses on ecological assessment of pesticides, especially probabilistic risk assessment and higher-tier ecotoxicological studies such as microcosms and mesocosms. His clients include major producers of pesticides, biocides, and pharmaceuticals. Recent projects include endangered species risk assessments of several pesticides, and a probabilistic risk model for rodenticides and non-target predators and scavengers. Dr. Giddings served on EPA's Aquatic Effects Dialog Group (1990-1992) and the Ecological Committee on FIFRA Risk Assessment Methods (ECOFRAM, 1996-2000; chair of Aquatic Effects Workgroup). He has participated in numerous expert workshops, including many sponsored by the Society of Environmental Toxicology and Chemistry (SETAC): "Application of Uncertainty Analysis to the Ecological Risks of Pesticides" (2002), "Extrapolation Practice for Ecological Effects and Exposure Characterization of Chemicals" (2003), "Re-evaluation of the State of the Science for Water-Quality Criteria Development" (1998), "Community-Level Aquatic System Studies -- Interpretation Criteria" (1999), "Higher-Tier Aquatic Risk Assessment for Pesticides" (1998). He is an active member of SETAC, having served as editor of its North American newsletter (1986-1999) and its global newsletter (2000-2003), and as Chair of the SETAC Publications Advisory Council (2003-present).

Frank Gobas

Dr. Frank A.P.C. Gobas is currently Full Professor and Director of the School of Natural Resource & Environmental Management, Simon Fraser University. Dr. Gobas holds a B.Sc (Chemistry, Free University of Amsterdam), M.Sc. (Environmental Chemistry and Toxicology, University of Amsterdam), and Ph.D. (Chemical Engineering and Applied Chemistry, University of Toronto). Dr. Gobas' research is focused on: the mechanisms of the uptake and bioaccumulation of organic substances in fish, plants and terrestrial wildlife, modelling the dynamics of chemical distribution and effects in food-chains and the hazard and risk assessment of environmental pollutants. His food-chain bioaccumulation models have been adopted by Environment Canada for bioaccumulation categorization and by the U.S. EPA for use in the Great Lakes Water Quality Initiative. Dr. Gobas has published more than 100 scientific papers on his research in various scientific journals and books. Dr. Gobas has further worked with government agencies in Canada and the U.S. and also with international organizations on regulatory issues related to the fate and exposure of environmental contaminants in wildlife and human populations. He has also been involved in a professional capacity in a number of contaminant fate and exposure studies in the U.S. These studies include the development of Total Maximum Daily Loads (TMDLs) for pollutants in rivers and estuaries and the development of water and sediment quality goals (e.g., San Francisco Bay TMDL).

Christian Grue

Dr. Chris Grue is Associate Professor and Leader of the Washington Cooperative Fish and Wildlife Research Unit within the School of Aquatic and Fishery Sciences at the University of Washington. Dr. Grue received a Bachelors degree in biology from the University of California at Santa Barbara, a Master's degree in biology from Northern Arizona University, and a Ph.D. in Wildlife and Fisheries Sciences from Texas A&M University. Dr. Grue's research is focused on the effects of environmental contaminants on fish and wildlife and their habitats. Dr. Grue began his career as a Research Wildlife Biologist in the Environmental Contaminant Research Branch of the U.S. Fish and Wildlife Service's Patuxent Wildlife Research Center in Laurel, Maryland, where he conducted research on the effects of environmental contaminants on songbirds and the effects of agricultural chemicals on the quality of prairie wetlands for adult and juvenile waterfowl. Dr. Grue's research and that of his graduate students at the University of Washington has focused on the efficacy and non-target effects of chemical and biological pest control within aquatic environments with an emphasis in Washington State and the Pacific Northwest. Recent studies include comparisons in the toxicity among active ingredients, formulated products and tank mixes (end products), effects of Bti control of mosquitoes on aquatic invertebrate communities, and the effects of pesticides in surface waters on the survival and reproduction of salmonids. He teaches a class in fish and wildlife toxicology. Dr. Grue is an active member the Society of Environmental Toxicology and Chemistry and the Wildlife Society and frequently serves on advisory panels dealing with pesticides and other environmental contaminants. He has recently served on FIFRA Science Advisory Panels, the Five-year Review Committee for the USGS's Contaminant Biology Program, and the Editorial Board of the Bulletin of Environmental Contamination and Toxicology, and was recently appointed to the External Advisory Group for the Washington Department of Ecology dealing with the agency's permit for aquatic weed control and eradication.

Lenwood Hall, Jr.

Mr. Lenwood W. Hall, Jr. is a Program Manager in Aquatic Toxicology at the University of Maryland's Wye Research and Education Center in Queenstown, Maryland. Mr. Hall received an M.S. in Fisheries Management from the Frostburg State College, Appalachian Environmental Laboratory, University of Maryland and a B.S. in Biology from East Carolina University. His areas of expertise are: aquatic toxicology; ecological risk assessment of pesticides, metals, and organometallics; exposure characterization of pesticides; development of biological/physical habitat indicators, and bioassessments. He has conducted research or consulting for 43 different government, academic and industrial organizations. He has published the following: 106 peer-reviewed papers; 3 books (another is currently in press); 24 book chapters/monographs and 103 technical reports. During 26 years of research, he has generated over 12 million dollars in funding from approximately 60 different research grants or contracts.

Charles Hawkins

Charles Hawkins is Professor of Aquatic Ecology in the Department of Aquatic, Watershed, & Earth Resources and Director of the Western Center for Monitoring and Assessment of Freshwater Ecosystems at Utah State University (www.cnr.usu.edu/wmc). Dr. Hawkins has been on the faculty of Utah State University since 1983 following completion of his PhD in Entomology at Oregon State University. He teaches courses in general ecology, stream ecology, water quality, and professionalism in the life sciences. His research focuses on the ecology and management of freshwater ecosystems with special emphasis on sampling designs and statistical methods applicable to ecological research, biological monitoring, and conservation; predictive modeling of community composition; use of aquatic biota to assess and monitor ecological integrity; cumulative effects of watershed alteration on the physical, chemical, and biotic condition of aquatic and riparian ecosystems; and the biology and ecology of freshwater invertebrates, amphibians, and fishes. Over the last 5 years, Dr. Hawkins has worked extensively with state and federal agencies to develop and evaluate scientifically defensible biological indicators and criteria for freshwater ecosystems. His research has been supported by grants from National Science Foundation, US EPA, and the US Forest Service. He has served on the editorial board of the Journal of the North American Benthological Society and served a 4-year term as Vice-Chair and Chair of the Aquatic Ecology section of the Ecological Society of America. He currently serves on the Ecological Processes and Effects Committee of the EPA's Science Advisory Board and the Community Condition Indicators Committee for the H. John Heinz III Center for Science, Economics and the Environment.

William Hayton

Dr. William L. Hayton is a Professor of Pharmacy in the Division of Pharmaceutics at The Ohio State University where he also serves as the Associate Dean for Graduate Studies and Research. His formal training includes the B.S. in Pharmacy degree (1967, University of Washington, Seattle, and the Ph.D. degree in Pharmaceutics (1971, State University of New York at Buffalo). Dr. Hayton’s expertise is pharmacokinetics, particularly construction and validation of mathematical models that describe or explain the kinetics of complex biological systems. One current research interest is characterization of the Fc receptor-mediated transport and catabolism of albumin and IgG in wild type and FcR knockout mice. A second project is the quantitative modeling of the female hypothalamus-pituitary-gonad (HPG) axis in the female rainbow trout (*Oncorhynchus mykiss*). The model is based on and integrates the biology of gonadotropin, estrogen, androgen and maturational hormone signaling systems, and it includes key intermediate steps in the signaling pathways; viz., gonadotropin and sex steroid synthesis, hormone receptors and their corresponding mRNA levels. Dr. Hayton’s expertise extends to interspecies scaling of pharmacokinetic model parameter values and xenobiotic metabolism with an emphasis on aquatic species, particularly fish. Dr. Hayton was a member of the Washington State University College of Pharmacy faculty for 19 years before coming to Ohio State in 1990 as Chair of the Division of Pharmaceutics. Dr. Hayton is author or co-author of about 100 peer-reviewed scientific publications, many of which report on the pharmacokinetics of xenobiotics in fish. He currently serves on the U.S. EPA Science Advisory Board Perfluorooctanoic Acid Risk Assessment Review Panel. He has held peer-reviewed grant support from the NIH, EPA, AFOSR, FDA, and USFWS. He is co-investigator on two NIH grants: “Preclinical Pharmacological Study of Antitumor and Other Therapeutic Agents,” K.K. Chan (PI), 12/01/04 to 11/30/11, and “FcRn Bind s and Transports Albumin,” Co-Investigator, C.L. Anderson (PI),, 3/01/05 to 02/28/10.

Robert Hoke

Dr. Robert Hoke is Principal Research Ecotoxicologist and Manager, Aquatic Toxicology, DuPont, Haskell Laboratory for Health and Environmental Sciences. Dr. Hoke received a Ph.D. in Fisheries and Wildlife; Environmental Toxicology, from Michigan State University, 1992; an M.S. in Biology from Bowling Green State University, 1981; and a B.S., in Biology from Bowling Green State University, 1976. Dr. Hoke has over 20 years experience in environmental toxicology, aquatic ecology, and the assessment of the fate and effects of contaminants in the environment. His experience includes working in industry, academic, consulting and government laboratory environments. He has conducted work in support of regulatory programs administered by the U.S. EPA and the U.S. Army Corps of Engineers. His specific areas of expertise are sediment toxicology; environmental risk assessment, including the environmental fate of contaminants and their effects on biotic communities; and the development of environmental assessment and toxicity testing methods. Dr. Hoke is a member of the Society of Environmental Toxicology and Chemistry, and the Ecological Society of America. Dr. Hoke has received the following honors and awards: EPA Scientific and Technological Achievement Awards – Honorable Mention – 1996; Quintessence Manuscript Award – Excellence in Environmental Contamination and Toxicology - 1994; Who's Who of Emerging Leaders in America - 2nd, 3rd, 4th Editions; Who's Who in the Midwest - 21st, 22nd and 23rd Editions; Michigan State University Graduate Recruiting Fellowship - 1987, 1988; University Scholarship, Bowling Green State University - 1972. Dr. Hoke has served on the following committees and boards: Water Research Environment Foundation (WERF) Project Subcommittee, Navigating the TMDL Process: Sediment Toxicity – 02-WSM-2; WERF Project Subcommittee, Navigating the TMDL Process: Narrative Criteria – 01-WSM-1; Short Course Committee, Society of Environmental Toxicology and Chemistry, 2001-03; Technical Committee, Society of Environmental Toxicology and Chemistry, 2003-current; Liaison Committee, Society of Environmental Toxicology and Chemistry, 2004 -current; Annual Meeting Committee, Society of Environmental Toxicology and Chemistry, 2001;Fellowship Committee, Society of Environmental Toxicology and Chemistry, 1993-96;Editorial Board - Society of Environmental Toxicology and Chemistry, 1992-95;Editorial Board - *Ecotoxicology and Environmental Safety*, 1996 - current.

Michael Hooper

Dr. Michael Hooper is an associate professor in the Environmental Toxicology Department and a member of The Institute of Environmental and Human Health at Texas Tech University. He received his B.S. degree in Biochemistry at California Polytechnic State University in 1981 and his Ph.D. in Pharmacology and Toxicology at the University of California at Davis in 1988. After a research faculty position at Western Washington University's Huxley College, he moved to Clemson University in 1989 where he was a member of the graduate faculty of Environmental Toxicology and The Institute of Wildlife and Environmental Toxicology. He moved to his current position at Texas Tech University in 1997. His area of expertise is the impacts of chemical contaminants on the health of wildlife inhabiting environments contaminated with pesticides or chemical wastes, with an emphasis on the use of such data in regulatory or remediation decision making. His current research investigates the bioaccumulation and effects of metals from mixtures that occur on contaminated mining and smelter sites, studying animals that inhabit these sites and working to develop assay methods that allow assessments of vertebrate species risk through food and water exposure routes. Dr. Hooper has served as an advisor to the Avian Effects Dialog Group, U.S. EPA Region 9 Biological Technical Advisory Group, and was a member of the U.S. EPA's ECOFRAM panel to establish probabilistic risk assessment guidelines for wildlife. His research program is funded through grants from National Institute of Environmental Health Sciences (NIEHS), U.S. EPA, U.S. Fish and Wildlife Service and U.S. Geological Survey.

Susan Kane Driscoll

Dr. Susan Kane Driscoll is an aquatic toxicologist with a Ph.D. in Environmental Sciences from the University of Massachusetts. After completing her degree, Dr. Driscoll was awarded a National Research Council post-doctoral fellowship at the National Oceanic and Atmospheric Administration (NOAA) Great Lakes Environmental Research Laboratory to conduct research on toxicity of sediment-associated organic contaminants. Dr. Driscoll also served as a post-doctoral research scientist at the Virginia Institute of Marine Science, examining the bioavailability and toxicity of sediment-associated organic contaminants to aquatic invertebrates. Her publications from this research are widely cited in the fields of bioavailability and sediment toxicology. Dr. Driscoll is a Senior Scientist and Project Manager at Menzie-Cura & Associates Inc., specializing in ecological risk assessments for RCRA, Superfund, and state hazardous waste sites nationwide, serving a variety of industrial, utility, and governmental clients. Dr. Driscoll has experience in the preparation of field-sampling plans, quality assurance project plans, risk assessment work plans, and the negotiation of their acceptance with state and federal regulatory authorities. Dr. Driscoll has more than 10 years experience as a field team leader, taking responsibility for coordination and management staff for the collection of field samples, implementation of quality control procedures, and coordination with subcontractors. Dr. Driscoll is also experienced in the development of technically defensible, risk-based clean-up numbers. Dr. Driscoll prepared the effects assessment section of the Hudson River baseline Risk Assessment. She developed a framework for selecting laboratory and field toxicity studies that were most appropriate for the assessment of risk to the Hudson River ecological receptors of concern. Dr. Driscoll has provided technical support for the U.S. EPA National Center for Environmental Assessment (NCEA). She reviewed laboratory and field studies and developed a database of dose-response relationships for the effects of dioxin-like compounds on birds. Dr. Driscoll has been a technical Reviewer for U.S. EPA Sediment Toxicity Methodologies. She was asked to provide technical reviews for U.S. EPA's guidance documents, including: *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures* and *Predicting Amphipod Toxicity from Sediment Chemistry.* Dr. Driscoll reviewed various the methodologies that were used in these reports to develop predictive relationships between concentrations of contaminants in sediment and toxicity to sediment-dwelling organisms. Dr. Driscoll is a member of the Society of Environmental Toxicology and Chemistry (SETAC) and the New England chapter of the Society of Risk Analysis.

Stephen Klaine

Dr. Stephen J. Klaine is a Professor in the Department of Biological Sciences and the Graduate Program of Environmental Toxicology at Clemson University. His research interest involves quantifying the impact of land use on aquatic ecosystems and developing strategies by which economically-viable land-use can coexist with good environmental quality. He received his doctorate from the Department of Environmental Science and Engineering, Rice University in 1982 and has spent the last 21 years conducting environmental research and educating graduate students. He joined the Department of Biology, University of Memphis, in 1982 where he developed an undergraduate concentration in toxicology, an extramurally-funded research program in environmental toxicology, and a graduate program that produced 8 M.S. and 4 Ph.D. graduates. In 1991, he moved his laboratory to Clemson University to help found the graduate program in environmental toxicology. Since then, he has graduated 20 M.S. and 15 Ph.D. students from Clemson University. Current research in his laboratory focuses on characterizing: the bioavailablity of metals and pesticides in aquatic systems; the comparative phytotoxicity of pesticides; the response of aquatic organisms to episodic contaminant exposures; and the water quality consequences of land use. His aquatic toxicology research on metals has focused on issues regarding bioavailability, ionoregulation, and episodic exposure. In addition, he is principal investigator on several proposals and projects that involve the development of novel approaches to characterize the interactive natural and social scientific aspects of land-use change and the sound management of natural capital. He has served on the FIFRA Science Advisory Panel. He has also previously served on the board of directors for the Society of Environmental Toxicology and is currently an aquatic toxicology editor for the journal *Environmental Toxicology and Chemistry*.

Thomas La Point

Dr. Thomas La Point directs the Institute of Applied Sciences at the University of North Texas and is a Professor in the Department of Biological Sciences. He received his Ph.D. from the Department of Biological Sciences at Idaho State University in Aquatic Biology. His primary research and teaching interests include contaminant effects on freshwater aquatic communities, specifically how metals and organic contaminants affect benthic population dynamics and freshwater fisheries. He has published on ecosystem measures, contaminant bioaccumulation, and sub-lethal effects on aquatic populations. Dr. La Point has served on several U.S. EPA Science Advisory panels concerned with pesticides and ecological risk and has worked as a consultant on Superfund issues at large sites. Dr. La Point is presently serving on a National Academy of Science National Research Council (NRC) Committee on Superfund Site Assessment and Remediation in the Coeur d'Alene River Basin. He is serving as Chair of a Water Environment Research Foundation subcommittee on whole-effluent testing as an indicator of aquatic health. He has served on several National Science Foundation (NSF), U.S. EPA and U.S. Geological Survey panels to review proposals submitted for funding. He is on the editorial board for *Chemosphere* and *Environmental Toxicology and Pharmacology* and has served as Editor of the Society of Environmental Toxicology and Chemistry (SETAC) Special Publication Series. Dr. La Point's current research is funded by the NSF, USEPA and the City of Denton, TX.

Igor Linkov

Dr. Igor Linkov is a Senior Scientist with Cambridge Environmental Inc. in Cambridge, MA, and Adjunct Professor of Engineering and Public Policy at Carnegie Mellon University in Pittsburgh, PA. Prior to joining Cambridge Environmental, Dr. Linkov was a Senior Risk Assessor and Team Leader at ICF Consulting, Arthur D. Little, Inc. and Menzie-Cura and Associates, Inc., where he conducted ecological and human health risk assessments for Superfund sites. Dr. Linkov has a BS and M.Sc. in Physics and Mathematics (Polytechnic Institute, Russia) and a Ph.D. in Environmental, Occupational and Radiation Health (University of Pittsburgh). He completed his postdoctoral training in Biostatistics and Toxicology and Risk Assessment at Harvard University. Dr. Linkov has managed ecological risk assessments and contributed to human health risk assessment at several Superfund sites. He has developed models and software to support ecological risk assessment and population modeling for contaminated sites, his recently completed modeling efforts include the FISHRAND model for PCB bioaccumulation in fish, used by the EPA for Hudson River Superfund site risk assessment. Dr. Linkov currently supports development of the Army Risk Assessment Modeling System (ARAMS) and also develops the risk-trace model for spatially explicit ecological risk assessment for the American Chemistry Council (ACC). One aspect of his current research is integrating risk assessment and multi-criteria decision analysis tools in managing contaminated sites. He is currently developing the Questions and Decision (QnD) model for environmental management at contaminated and disturbed sites for the U.S. Army Corps of Engineers. He has published widely on environmental policy, environmental modeling, and risk analysis, including five books and over 70 peer-reviewed papers and book chapters. Dr. Linkov has directed and chaired six international conferences on risk assessment and modeling and participated in organizing many others. Dr. Linkov serves as a Scientific Advisor to the Toxic Use Reduction Institute, a position which requires nomination by the Governor of Massachusetts. Dr. Linkov is President for the Society for Risk Analysis (SRA)-New England. He also is the Past Chair of the SRA Ecological Risk Assessment Specialty Group and participates in several SRA and Society for Environmental Toxicology and Chemistry (SETAC) Committees. Dr. Linkov has served on many review and advisory panels for US and international agencies, including risk assessment reviews for Superfund sites. Over the last two years, Dr. Linkov’s research has been supported by the U.S. Army, U.S. Army Corps of Engineers, U.S. EPA, Department of Transportation (DOT), Department of Energy (DOE), National Oceanic and Atmospheric Administration (NOAA), North Atlantic Treaty Organization, U.S. Chamber of Commerce, American Chemistry Council, Dow Chemical, Chevron, and various private clients.

Elwood Linney

Dr. Elwood Linney is Professor of Molecular Genetics and Microbiology at the Duke University Medical Center and Professor in the Nicholas School of the Environment there. He has a Ph.D in molecular biology, an M.S. in biophysics and a B.S. in engineering physics. He set up and directed the Transgenic Mouse Facility for the Duke Comprehensive Cancer Center and directs a Transgenic Fish Facility for the Duke Superfund Center. His expertise includes using modern technologies to examine the interaction of the environment with fish species (in particular zebrafish). His laboratory has made fluorescent, transgenic biosensor fish for sampling the aquatic environment and is using genomics approaches to examine clusters of genes and pathways that are affected by environmental exposure. His recent work has been involved in examining the susceptibility of the embryonic fish nervous system to aquatic contaminants and the effects they can play on fish behavior and learning. He is examining orthologous pathways in fish and other species to determine the efficacy of drawing conclusions from aquatic species that might be relevant to human health. He is currently on the external advisory board for two National Institute of Environmental Health Science (NIEHS) funded Marine/Freshwater Centers and Principal Investigator for Duke University's contribution to the NIEHS Toxicogenomics Research Consortium.

Lynn McCarty

Dr. Lynn McCarty is the Principal of L.S. McCarty Scientific Research & Consulting, an ecotoxicological consulting company. Dr. McCarty received B.Sc. and M.Sc. degrees from Brock University and a Ph.D. from the University of Waterloo. He has spent over 25 years in examining various aspects of toxicology and environmental contamination. This includes employment at private consulting companies as well as the Health Studies Service of the Ontario Ministry of Labour. Dr. McCarty has been involved in a variety of projects examining environmental impacts and health effects in an assortment of situations and contaminants. This includes the preparation of over two dozen Ambient Air Quality Criteria documents for the Ontario, Canada Government, production of seven ambient water quality guideline documents (both single and groups of chemicals) for the Ontario and Canadian Governments, preparation and review of computerized chemical dossiers, and critical reviews of various environmental quality guidelines, protocols, and risk assessments, including those associated with the Canadian Environmental Protection Act. In addition, Dr. McCarty has been an active team member in a number of health and environmental risk modelling and assessment projects. These include: effects associated with the siting and operation of domestic and hazardous waste treatment facilities (sewage, landfill, and incineration); siting and operation of nuclear and hydroelectric power stations, effects of liquid and solid wastes from pulp and paper mills; effects of past, current, and proposed mining operations; effects associated water, sediment, and soil contamination by petroleum products; and effects of chemical pesticides and biocontrol agents in the forestry industry. Expert testimony has also been provided. Dr. McCarty has been an invited expert at a number of workshops sponsored by Canadian Network of Toxicology Centers (CNTC), Society of Environmental Toxicology and Chemistry (SETAC), U.S. EPA, and U.S. Army Corps of Engineers. He is a coauthor of two chapters in the second edition of the standard reference book *Fundamentals of Aquatic Toxicology* (Rand, 1995). In addition to reports to clients, he continues to publish in the primary scientific literature, contribute to book chapters (over 45 publications to date), make presentations at professional scientific meetings, and currently serves on the editorial boards of *Human and Ecological Risk Assessment*. The Ontario Canada Government has recognized his scientific work by awarding him the Ontario MOE Excellence in Research - Water Quality in 1990. His toxicological interests are focused in the areas of residue-based potency estimation, mixture toxicity, and environmental risk management/assessment

Charles Menzie

Dr. Charles Menzie is Principal of Menzie-Cura & Associates, Inc. Dr. Menzie received a Ph.D. in Biology from City University of New York (1978); an M.A. Biology from City College of New York (1974); and a B.S. in Biology from Manhattan College (1971). Dr. Menzie has provided support to the National Estuaries Program (EPA/Coastal Zone Management), Risk Assessment Forum (U.S. EPA), Office of Water (EPA), Minerals Management Service, Office of Technology Assessment (U.S. Congress), and the NOAA. Dr. Menzie's research and work have also included development of ecological risk assessment methods as applied to wetlands and freshwater systems (U.S. EPA Corvallis Laboratory) and natural resource damage assessments. Dr. Menzie specializes in water quality analysis, environmental investigations and remedial planning, analysis and design of hazardous and non-hazardous waste disposal systems, facility siting, port and harbor development, ocean-thermal energy conversion, and endangerment assessments. Dr. Menzie has conducted peer-reviews of ecological risk assessments for the U.S. EPA's Risk Assessment Forum. This was a three-year program to develop Ecological Risk Assessment Guidelines. He was responsible for coordinating peer reviews of case studies prepared by experts in various areas of ecological risk assessment. Dr. Menzie used these case study reviews to prepare an U.S. EPA report to serve as interim guidance for the conduct of ecological risk assessments. He is also working with the U.S. EPA Risk Forum and National Academy of Science personnel to develop a series of presentations on ecological risk assessment.

Joseph Meyer

Dr. Joseph Meyer is Associate Professor, Department of Zoology and Physiology, University of Wyoming. Dr. Meyer holds the following degrees: Ph.D. Zoology, University of Wyoming (1986); B.S. Chemical Engineering, Lehigh University, Bethlehem, PA (1973). Dr. Meyer's areas of expertise and research activities focus on: biogeochemistry of nutrients, metals, and organics in aquatic ecosystems; aquatic toxicology; and ecology. Dr. Meyer's current research activities include work on: the effects of metal-organic interactions on bioavailability of metals to aquatic organisms; multidisciplinary collaboration on biogeochemistry of trace elements in aquatic ecosystems. Dr. Meyer's advisory and workshop activities include: Society of Environmental Toxicology and Chemistry (SETAC) Workshop on Dietborne Metal Toxicity to Aquatic Organisms; Workshop on the Development of a Marine Biotic Ligand Model; Workshop on Re-evaluation of State of the Science for Water Quality Criteria Development; Member of U.S.EPA Science Advisory Board's (SAB) Health and Ecological Effects Subcommittee (HEES) of the Advisory Council on Clean Air Compliance Analysis (ACCACA) (1998-2003); Member of U.S. EPA SAB's Advisory Council on Clean Air Compliance Analysis Physical Effects Review Subcommittee (ACCACAPERS, formerly CAACACPERS) (1994-1997); Member of Rio Tinto Borax's Boron Ecotoxicology Advisory Group. Dr. Meyer assisted in writing draft document titled *2003 Update of Ambient Water Quality Criteria for Copper* (EPA 822-R-03-026). Dr. Meyer's sources of recent grant and contract support include: U.S. Geological Survey, U.S. Fish and Wildlife Service, International Lead Zinc Research Organization, U.S. EPA, Water Environment Research Foundation, International Copper Association, and Stratus Consulting.

Judith Meyer

Dr. Judith L. Meyer is a Distinguished Research Professor in the Institute of Ecology at the University of Georgia. She holds a B.S. in Zoology from the University of Michigan, a M.S. in Zoology from the University of Hawaii, and a Ph.D. in Ecology from Cornell University. She has been on the faculty at University of Georgia since 1977. She is an aquatic ecologist who has published over 150 scientific papers on her research on rivers and streams. Her research has focused on ecological processes that maintain water quality, on river and stream food webs, and on the impact of watershed disturbance, urban development, and riparian zone management on river and stream ecosystems. Her current research is on urban rivers, impacts of lawn care practices on stream ecosystems, nitrogen cycling in rivers, impacts of excessive sedimentation on aquatic biota, importance of decaying leaves and woody debris in stream ecosystems, and effects of changes in riparian buffer designations for Georgia's trout streams. She served as Principal Investigator for the Coweeta Long-term Ecological Research Site. Recent funding sources are National Science Foundation, U.S. Environmental Protection Agency Water and Watersheds Program, U.S. Fish and Wildlife Service, Mott Foundation, The Nature Conservancy, and Georgia Department of Natural Resources. Dr. Meyer has held numerous leadership positions in her profession and has been appointed to numerous committees of the National Academy of Sciences/National Research Council including the Water Science and Technology Board. She was President of the Ecological Society of America from 1994-1995, and Vice President from 1991-1992. She has been Director for Science of the River Basin Science and Policy Center at the University of Georgia since 1999; and is a Fellow of the American Association for the Advancement of Science. She was the U.S. National Representative to the International Association for Theoretical and Applied Limnology from 1992-2001; served on the Governing Boards of the Council of Scientific Society Presidents from 1994-95; and Water Science and Technology Board, National Academy of Sciences from 1990-1993. She is a member of the Ecological Processes and Effects Committee of the EPA Science Advisory Board. She serves as Chair of the Science and Technical Advisory Committee of American Rivers, a national river conservation organization. She served on the Freshwater Working Group that helped prepare the Heinz Center Report *The State of the Nation's Ecosystems*. She was recently named a Clean Water Act Hero by the Clean Water Network for her scientific research that has contributed to achieving the goals of the Clean Water Act. She is the recipient of the 2003 Award of Excellence in Benthic Science from the North American Benthological Society.

Richard Meyerhoff

Dr. Richard Meyerhoff is a Principal with Camp, Dresser & McKee (CDM), Inc., in Denver, Colorado. He received a Ph.D. in 1991 from Oregon State University in Aquatic Ecology with emphasis on the macroinvertebrate communities of streams. He received a M.S. and B.S. in Biology in 1984 and 1981, respectively, from Baylor University. Dr. Meyerhoff has more than 17 years of technical and regulatory experience in water-related issues, especially issues involving aquatic habitats in the arid west. He spent more than six years with the Arizona Department of Environmental Quality working on various aspects of state and federal surface water quality regulations, including implementing the development of Arizona's bioassessment program, overseeing that state's development and public review of water quality standards, assessing water quality standards attainment and, where necessary, developing use attainability analyses to establish appropriate beneficial uses. Since 1997, Dr. Meyerhoff has worked as a consultant to federal, state and private clients. Project activities have been primarily focused on regulatory issues involving water quality standards development, use attainability analyses, NPDES permits and the use of bioassessments as a tool to evaluate water quality. Since 2001, Dr. Meyerhoff has served as the Research Manager for the Arid West Water Quality Research Project (AWWQRP), an EPA-funded project to conduct research on arid west water quality standards issues, especially for effluent-dependent and ephemeral waters. For the AWWQRP, he is currently overseeing research on three projects involving the establishment of appropriate water quality criteria for arid west waters: Biotic Ligand Model Evaluation, Use of the EPA Recalculation Procedure, and Feasibility of Developing an Ammonia Water Effect Ratio. Also, through a AWWQRP partnership with the Water Environment Research Foundation he is supporting research on a pilot study to evaluate the use of whole effluent chronic toxicity testing as a predictor of ecological health in aquatic communities. In addition to these research management activities, Dr. Meyerhoff co-authored the AWWQRP Habitat Characterization Study, which described the physical, chemical and biological characteristics of ten effluent-dependent and effluent-dominated waters in the arid west. He has been invited to participate in a number of forums to present AWWQRP research results, e.g., (1) Association of Metropolitan Sewerage Agencies annual meeting (July 2004), (2) the Western State's Water Council (Western Governor's Association) special workshop devoted to arid west water quality standards issues (December 2002), (3) the U.S. EPA National Symposium on "Designating Attainable Uses for the Nation's Waters (June 2002), and (4) the Western Coalition of Arid States.

Ellen Mihaich

Dr. Ellen Mihaich has worked in the pesticide and chemical industry for over 15 years. She is currently the owner and president of Environmental and Regulatory Resources, LLC, an environmental consulting company. Prior to this position, she worked 10 years for Rhone-Poulenc as the environmental toxicologist responsible for pesticide development, FIFRA registration, and risk assessment. She worked 5 years, for Rhodia Inc., a specialty and commodity chemical company doing similar environmental toxicology and risk assessment for TSCA and FDA regulated compounds. She has also been responsible for evaluating incident reports and taking appropriate action for regulatory reporting and incident management and mitigation. Dr. Mihaich received both M.S. and Ph.D. degrees in environmental toxicology from Duke University, where she currently holds an adjunct appointment and teaches a graduate-level course in risk assessment. Dr. Mihaich is a Diplomate of the American Board of Toxicology. Currently, Dr. Mihaich is president of the Society of Environmental Toxicology and Chemistry. She is a nominee for appointment to the Strategic Environmental Research and Development Program (SERDP), the environmental research program of the Department of Defense in conjunction with US EPA and U.S. DOE. For the last 5 years she has been a Business and Industry Advisory Committee (BIAC) representative to the Organization for Economic Cooperation and Development (OECD) Ecological Validation Management Group for endocrine testing. She has been an invited participant on two ICCVAM panels on in vitro testing methods for endocrine active compounds and the use of the FETAX assay in human health assessment. She is an external advisory board member to the Institute of Environmental Toxicology at Clemson University. She currently has no grant or contract support for research.

Thomas Mueller

Dr. Thomas C. Mueller is a Professor in the Department of Plant Sciences in the Institute of Agriculture at the University of Tennessee. He is located on the main campus in Knoxville, which is the flagship campus for the land grant University for the state of Tennessee. He received his B.S. from the University of Illinois in Agronomy, his M.S. from the University of Kentucky in CropScience, and his Ph.D. from the University of Georgia in Crop Science. His graduate studies focused on weed science, specifically how herbicides behave in plants and the environment. His primary research area is the environmental fate of pesticides (especially herbicides) in soils, water systems, and in the air (via drift). His main commodity focus is corn and soybeans, although he has conducted research in cotton, rice, wheat, pastures, turf, native areas (national parks), and others. This diversity in research areas and teaching several undergraduate and graduate courses has imparted a broad perspective, one that realizes that integrated pest management must consider environmental and ecological ramifications of crop productions systems. Dr. Mueller has previously served on the EPA FIFRA Scientific Advisory Panel, is currently on the Publications Oversight committee for his national organization (Weed Science Society of America), has served as an associate editor for the technical journals in his discipline (*Weed Science*, *Weed Technology*), is currently on the executive board in his regional technical society (Southern Weed Science Society), and is active in various state, regional, and national programs. He is a frequent reviewer for the *Journal of Agriculture and Food Chemistry*, and for the *Journal of the Association of Official Analytical Chemists*. His sources of funding include Hatch funding through the Tennessee Agricultural Experiment Station, Regional project funds, indirect support from corporate sponsors, and support from commodity associations (Tennessee Soybean Promotion Board, Tennessee Turf Association).

Michael Newman

Dr. Michael C. Newman received degrees in zoology from the University of Connecticut (B.A., M.S.) and environmental sciences from Rutgers University (M.S., Ph.D.). After his postdoctoral studies, he was a research ecologist at the University of Georgia's Savannah River Ecology laboratory. He now holds a Professor of Marine Science position at the College of William and Mary's School of Marine Science after ending a three-year term as Dean of Graduate Studies of the School of Marine Science. His research emphasizes quantitative methods in ecotoxicology with topics of interest ranging from chemical measurement statistics to QSAR-like models for predicting metal ion effects to contaminant effects on population genetics to methods of predicting community level effects. He has authored approximately 100 publications on these topics including four books, *Quantitative Methods in Aquatic Ecotoxicology, Fundamentals of Ecotoxicology, Population Ecotoxicology* and *Community Ecotoxicology*. He also edited several books, *Metal Ecotoxicology, Hierarchical Ecotoxicology, Risk Assessment: Logic and Measurement, Coastal and Estuarine Risk Assessment*, and *Risk Assessment with Time-to-Event Models*. Dr. Newman is active in advisory service. He served on OECD, EPA, DOE, NAS, and state environmental regulatory and risk assessment committees and panels. He was one of two U.S. members of an OECD team charged with assessing statistical methods for analyzing toxicity data. Work with DOE involved complex-wide consideration of data quality objectives for risk assessment activities, and various site-specific advisory services to the Savannah River and Hanford sites. He has been a member of numerous EPA teams including the FIFRA ECOFRAM working group, two FIFRA science advisory panels, the Chesapeake Bay Office science advisory board, a FQPA scientific review board, and a joint U.S. EPA-Israeli Water Agency working group. He has reviewed numerous risk assessment documents for EPA and was a consultant to the NAS (Everglades Ecosystem Assessment). He continues to work actively with various Virginia Department of Environmental Quality teams and panels.

Eva Oberdorster

Dr. Eva Oberdörster is a Lecturer in the Department of Biology at Southern Methodist University in Dallas, Texas. Dr. Oberdörster received a B.S. in Biology from Binghamton University, Binghamton, NY (1992) and a Ph.D. in Zoology; Integrated Toxicology Program from Duke University, Durham, NC. (1997). Dr. Oberdörster was a post doctoral fellow from 1997-1998 at the Tulane/Xavier Center for Bioenvironmental Research, Tulane University, New Orleans, LA. Dr. Oberdörster's professional appointments include: 1998-2000, Assistant Professor, Department of Environmental Toxicology, Clemson University, Clemson, SC, Adjunct for 2001; 2001-present, Lecturer, Department of Biological Sciences, Southern Methodist University, Dallas, TX; 2002-present, Adjunct Assistant Research Scientist, Division of Coastal Systems Science and Policy Duke University Marine Laboratory, Beaufort, NC; 2003-present, Adjunct Assistant Professor, Department of Environmental Studies, Baylor University, Waco, TX. Dr. Oberdörster's research interests focus on mechanisms of nanoparticle toxicity, and cell-signaling pathways used by invertebrate peptide and steroid hormones. Dr. Oberdörster's sources of recent grant and contract support and consulting activities include: 1998, University Research Grant, Clemson University. "Pollution resistance in estuarine shrimp." 1999, U.S. EPA, Science to Achieve Results (STAR) Program Co-P.I. with Patricia McClellan-Green, Duke University Marine Laboratory. "Endocrine Disruption in Marine Gastropods by Environmental Chemical Mixtures. " 1999, USDA, SC Agriculture and Forestry Research System, "Physiological and reproductive effects of cropland production chemicals on aquatic invertebrates. " 2002, U.S. Fish and Wildlife Service, open-ended contract Analysis of fish from Arkansas Wildlife Refuges for elevated liver EROD activity. 2002, U.S. EPA, Region 6 Co-PI with Dr. John Easton, SMU Environmental Engineering "Environmental levels and toxicity of ED hormones released from concentrated animal feeding operations and sanitary sewer overflows in the Bosque River, TX." 2005 Woodrow Wilson Center for International Scholars, Foresight and Governance Project: Nanotechnology, Co-PI with Dr. Patrick Larkin, EcoArray LLC. Dr. Oberdörster has been a collaborator/consultant in the following activities: 2002, Impacts of anthropogenic chemicals on hepatic function in Florida's American alligator. In collaboration with Dr. Lou Guillette, University of Florida. 2003, Costa Rica-USA Foundation (CRUSAF) Biological Monitors of Contamination and Endocrine Disruption in Coastal Areas of Costa Rica. PI John McLachlan, Tulane Center for Bioenvironmental Research. 2003, Center for Biological and Environmental Nanotechnology (CBEN), Rice University. Toxicity of nanoparticles to aquatic species. In collaboration with Dr. Vicki L. Colvin. Dr. Oberdörster is a member of the following academic professional organizations: Society of Environmental Toxicology and Chemistry (SETAC); Carolina SETAC, a regional section of SETAC; Society of Toxicology (SOT); Women in Toxicology (WIT), an SOT Specialty Section; and the American Association of Zoos and Aquaria (AZA).

James Oris

Dr. James Oris received a B.A. in Biology from Wittenberg University (1979) and a Ph.D. in Environmental Toxicology and Fisheries & Wildlife from Michigan State University (1985). He is currently a Professor in the Department of Zoology and co-directs the Center for Environmental Toxicology and Statistics at Miami University in Oxford, Ohio. His areas of research interest center on the ecological toxicology of organic chemicals in aquatic systems. His primary interest is the study of the fate and effects of polycyclic aromatic hydrocarbons in freshwater systems. Sediment toxicity, photo-induced toxicity, long-term reproductive toxicity, routes of uptake, multigenerational effects, and environmental factors which may alter fate and effects have been areas of study. He is also interested in standard toxicity test development and methodology, including the statistical modeling and analysis of chronic toxicity dose-response relationships. More recently, he has begun to apply molecular biomarker techniques to assess contaminant exposure to fish in field situations, focusing on the interaction of multiple contaminants on biomarker response. He has published over 70 peer-reviewed scientific research articles and over 120 abstracts. He has served on editorial or review boards of 8 journals, 6 books and 9 granting agencies. He currently serves as the Vice President of the Society of Environmental Toxicology and Chemistry North America (SETAC-NA) (2003) and served as President of SETAC-NA in 2004.

Thomas Purcell

Dr. Thomas Purcell is a Senior Environmental Scientist dealing with water-related issues for the American Petroleum Institute. He holds a Ph.D. in Marine-Estuarine Environmental Science (MEES) from the University of Maryland, 1988; an M.S. in Marine Biology from Old Dominion University, 1974; and a B.S. in Biology from Florida Atlantic University, 1966. Dr. Purcell's research for M.S., Ph.D. and employment has focused on effects on phytoplankton populations dynamics caused by runoff-borne materials. Non-research employment has dealt with the application of aquatic toxicological data and information to regulation. Dr. Purcell participated in the development of the1985 Aquatic Life Criteria Guidelines while working at the U.S. EPA, and he has served on two FACA committees since moving to private industry association work. He is a member of the Society of Environmental Chemistry and Toxicology (SETAC), current president of the Chesapeake Potomac Regional Chapter, and Platform co-chair for the 2005 SETAC annual meeting. He has no recent grant or contract support.

Charles Rabeni

Dr. Charles Rabeni holds a Ph.D. in zoology from the University of Maine. He is Leader of the Missouri Cooperative Fish and Wildlife Research Unit, and Professor in the Department of Fisheries and Wildlife, University of Missouri. His research addresses questions useful to the conservation or restoration of the biological integrity of streams to enhance their recreational and ecological benefits. His focus is on invertebrates and fishes as endpoints and integrators of ecological conditions. His interest is in delineating those key environmental factors influencing the biota - such as siltation, dissolved oxygen, and extreme temperatures - and to design cost effective mitigation strategies. One current effort is a series of projects aimed at producing biologically-sound sediment criteria for Missouri streams. Dr. Rabeni has published over 90 peer-reviewed journal articles, book chapters, and book editorships. He has served in numerous capacities with the North American Benthological Society, including as President in 1992. For the American Fisheries Society, he served in numerous capacities including President of the Missouri Chapter and for two years as Associate Editor for the Transactions of the American Fisheries Society. Dr. Rabeni has served on numerous panels and board, including: assisting the National Park Service by serving on expert panels and task forces to develop long-term monitoring protocols for their Prairie Cluster Park network, and their Heartland Park network; serving on an expert panel for the U.S. Geological Survey's Grand Canyon Monitoring and Research Center to evaluate the existing biological research and monitoring program for the Colorado River; assisting the national office of the Nature Conservancy in their project for the conservation of aquatic species and ecosystems in the Central Tallgrass Prairie Region; as a member of an interagency team advising the Mark Twain National Forest (USFS) on research necessary to evaluate cumulative effects of timber harvest on aquatic fauna; serving on a joint agency (MDC, MDNR, NRCS) work group evaluating the ecological consequences of proposed NRCS PL-566 projects; serving as the scientific advisor on the Missouri Aquaculture Task Force to review relations between private aquaculture industry and the Missouri Department of Conservation; serving on the Liaison Committee of the WRD/USGS National Water Quality Assessment Program-Ozark Region.

Robin Reash

Mr. Robin J. (Rob) Reash is a Principal Environmental Scientist with American Electric Power Company, located in Columbus, Ohio. American Electric Power (AEP) is the largest (total capacity) investor-owned electric utility in the United States, and operates generating facilities in 10 states. Mr. Reash has worked at AEP for 19 years. His principal duties are: 1) conducting applied research on the potential effects of power plant emissions and discharges on environmental receptors; 2) conducting site-specific or region-specific studies required for obtaining protective National Pollution Discharge Elimination System (NPDES) permits for AEP generating facilities; 3) actively participating with national research organizations (Electric Power Research Institute and Water Environment Research Foundation) to help develop targeted, proactive applied research studies; and 4) actively participate with industry trade group associations to evaluate the scientific basis of proposed regulations and other regulatory initiatives. Mr. Reash has previous work experience with Ohio EPA and the Oklahoma Water Resources Board. Mr. Reash's areas of expertise are ecotoxicology, bioaccumulation risk assessment, water quality criteria development, and trace metal bioavailability. He received a Master of Science degree from the Ohio State University in 1984. He has been active in the Society of Environmental Toxicology and Chemistry (national and regional levels), and is currently serving as chairman of a WERF (Water Environment Research Foundation) project on the development of incorporating parameters of pollutant exposure frequency, magnitude, and duration in the development of kinetic models for various water quality criteria. He also serves on a multi-stakeholder peer group that is evaluating potential changes to the ambient temperature water quality criteria for the Ohio River, and is an industry consultant for re-evaluation of the aquatic life aluminum criterion in West Virginia. He served as President of SETAC's Ohio Valley Chapter in 1992, and is currently serving as a board member of the chapter. In 2002 he served as an external peer reviewer for U.S. EPA's "Draft Revised Aquatic Life Criteria for Selenium." His current research projects are focusing on patterns of atmospheric deposition and bioaccumulation of mercury in receptors near coal-burning power plants. During the past 15 years Mr. Reash has obtained funding from AEP's research and development program for conducting applied research. Mr. Reash has authored three book chapters and has authored, or co-authored, more than 16 technical publications in peer-reviewed journals. In 1998 Mr. Reash was certified as a Certified Fisheries Scientist by the American Fisheries Society. He received the Steven J. Koorse Award of Excellence from the Utility Water Act Group in 2004 for his leadership and technical contributions to the trade group's Water Quality Committee. In 2005 he received a "Research Champion Award" from the Electrical Power Research Institute for identifying key research needs on effects of heated water on aquatic life.

Daniel Schlenk

Dr. Daniel Schlenk is Professor of Aquatic Ecotoxicology and Environmental Toxicology at the University of California Riverside. Dr. Schlenk received a B.S. in Toxicology from the University of Louisiana, Monroe in 1984, and a Ph.D. in Toxicology from Oregon State University in 1989. He was supported by a National Institute of Environmental Health Science postdoctoral fellowship at Duke University from 1989-1991. He was elected to the Board of Directors for the North American Society of Environmental Toxicology and Chemistry in 2003 and has been a Visiting Scholar in the Department of Biochemistry, Chinese University of Hong Kong 1995; 1998; 1999; a recipient of the Ray Lankester Investigatorship -Marine Biological Association of the United Kingdom 1998; a Visiting Scholar of the Instituto Del Mare, Venice Italy 1999; and a Visiting Scientist at the CSIRO Lucas Heights Laboratory, in Sydney Australia 2003. He serves on the editorial boards of *Toxicological Sciences, Aquatic Toxicology, Marine Environmental Research* and *Environmental Toxicology and Chemistry*. He has co-edited a 2 volume series entitled *Target Organ Toxicity in Marine and Freshwater Teleosts* and has published more than 100 peer reviewed journal articles. His research interests revolve around the fate and effects of environmental agents in aquatic organisms but focus upon contributions of biochemical defense systems toward species susceptibility to environmental toxicants.

William Stubblefield

Dr. William Stubblefield is a senior environmental toxicologist with Parametrix, Inc. in Corvallis, Oregon; he also holds a courtesy faculty appointment in the Department Molecular and Environmental Toxicology at Oregon State University. Dr. Stubblefield has more than 15 years of experience in environmental toxicology, ecological risk assessment, water quality criteria derivation, and aquatic and wildlife toxicology studies. He has authored more than 50 peer-reviewed publications and technical presentations in the areas of aquatic and wildlife toxicology and environmental risk assessment. He is a co-editor of a recently published book entitled, *Re-evaluation of the State of the Science for Water Quality Criteria*, that specifically examines the issues and approaches to be used in the evaluation of environmental impacts associated with contaminants in multiple media. Dr. Stubblefield's research efforts have looked at the fate and effects of metal and hydrocarbon contaminants in the environment and the relationships between these contaminants in the water/sediment/soil compartments. He has also investigated food chain concerns through research efforts such as the investigation of metals transfer in resident aquatic and terrestrial organisms on Alaska's North Slope. His most recent research uses a combination of laboratory and field methods to investigate the effects of storm water-associated short-term pulse exposures of metals to aquatic organisms and examines the fate and disposition of storm water-associated metals in natural systems. About 70 percent of Parametrix projects are funded by municipal and other government agencies the remainder are industrial clients. Funding for the majority of Dr. Stubblefield's metal related work comes from industrial trade associations or not-for-profit research organizations working in cooperation with U.S. EPA. Dr. Stubblefield is an active member of the Society of Environmental Toxicology and Chemistry, where he serves as the Society's vice-president, member of the Board of Directors, chairman of the Publications Advisory Council, chairman of the SETAC's Metals Advisory Group, past member of the Editorial Board for Environmental Toxicology and Chemistry, and 2002 annual meeting co-chair. He has been an invited participant at a number of scientific and regulatory conferences, served on U.S. EPA peer-review panels, and frequently acts as a technical reviewer for a number of scientific publications. Dr. Stubblefield has a Ph.D. in Environmental Toxicology from the University of Wyoming, a M.S. degree in Toxicology/Toxicodynamics from the University of Kentucky, and a B.S. in Biology from Eastern Kentucky University.

Timothy Thompson

Mr. Timothy Thompson is a Senior Environmental Scientist with Science, Engineering, and the Environment, LLC. Mr. Thompson holds an M.S. in Ocean Sciences from the University of British Columbia, and was a Monbusho Fellow, at the University of Nagasaki and Tokyo Fisheries University, Japan. He has 18 years of experience in characterization and management of sediments. National experience in sediments comes from his leadership roles as the project manager for the Remedial Investigation and Feasibility Study for the Lower Fox River/Green Bay PCB CERCLA Site in Wisconsin, as the project manager for a for a large sediment RCRA Facilities Investigation and Corrective Measures Study at a playa lake and on the North Platte River, and as a peer reviewer on the Hudson River PCB Superfund site. Past experience includes developing sediment and water quality monitoring programs for assessing sediment alternatives for a creosote-contaminated site in Washington, developing a long-term monitoring plan for the Fox River, development and application of sediment transport models to environmental decision making. His experience in sediments also includes habitat evaluations and integration of field data with spatial modeling tools, spatial characterization and statistical analysis of bedded sediment data, bedded sediment characterization, water quality monitoring, and ecological risk assessment.

Timothy Ward

Dr. Timothy J. Ward is a Senior Environmental Toxicologist with Gradient Corporation. He has 30 years of experience conducting and supervising ecological fate and effect studies. His expertise includes the aquatic toxicity of metals, biocides, pharmaceuticals, agricultural and commodity chemicals, oils and drilling fluids, hazardous wastes, contaminated soils, sludge, sediment, water, and effluents. He has managed complex multidisciplinary scientific studies following U.S. EPA (TSCA, FIFRA), OPPTS, OECD, FDA, and ASTM guidelines, and directed ecotoxicology laboratories. During the 12 years before joining Gradient in 2004, he was the President and Co-Founder of T.R. Wilbury Laboratories, Inc. and he has managed ecotoxicology laboratories at the EnviroSystems Division of Resource Analysts, Inc., ENSECO, Inc., and United States Testing Company. He has implemented and managed Good Laboratory Practice (GLP) programs. He has authored hundreds of technical reports, published numerous articles, and made many presentations on aquatic toxicology and environmental fate. He served as a member of the editorial board for the 15th and 16th Editions of *Standard Methods for the Examination of Water and Wastewater*, has been a member of the American Society for Testing and Materials (ASTM) since 1976, and is a charter member of the Society of Environmental Toxicology and Chemistry (SETAC). Dr. Ward received his B.A. in Biology from The College of the Holy Cross, his M.S. in Marine Science from Long Island University, and his Ph.D. in Environmental Science from the University of Massachusetts Boston. Recent contract support at Gradient Corporation has come from United Technologies Corporation, Environmental Resource Management (ERM), Wyeth Pharmaceuticals, and several law firms. While president of T.R. Wilbury Laboratories, contract support for evaluating the influence of water quality parameters on the chronic toxicity of silver to marine organisms was provided by the International Imaging Industry Association.

Judith Weis

Dr. Judith Weis is a Professor, Department of Biological Sciences, Rutgers University, Newark NJ. She previously served as Associate Dean for Academic Affairs at the University. She also has served as American Association for the Advancement of Science (AAAS) Congressional Science Fellow with the Senate Environment and Public Works Committee, and Program Director at the National Science Foundation. She has been a visiting scientist at EPA, both at the research lab at Gulf Breeze FL and in the Office of Water (Ocean and Coastal Protection Division). She received her bachelor's degree from Cornell University, and M.S. and Ph.D. from New York University. Dr. Weis' research has focused on estuarine ecology and ecotoxicology. She has published over 150 refereed papers, focusing mainly on stresses in the estuarine environment, and their effects on organisms, populations and communities. Particular areas of focus have been effects of metal contaminants on growth, development, and behavior; development of tolerance to contaminants in populations living in contaminated areas; effects of invasive marsh plant species on estuarine ecology and on fate of metal contaminants. Much of her research has been focused on estuaries in the New York/New jersey Harbor area. Dr. Weiss has served on numerous advisory committees and has held leadership positions: Boards of Directors of the Society of Environmental Toxicology and Chemistry (SETAC) and the American Institute of Biological Sciences (AIBS); Chair of the Biology Section of American Association for the Advancement of Science (AAAS) in 2000; and President of AIBS in 2001. She is currently Board member of the Association for Women in Science (AWIS). She is a fellow of the American Association for the Advancement of Science (AAAS). She has served on advisory committees for the U.S. EPA Scientific and Technical Achievement Awards (STAA) for the U.S. EPA Science Advisory Board, and the Endocrine Disruptors Screening and Testing Advisory Committee – EDSTAC) and for the National Oceanic and Atmospheric Administration (NOAA). She has been a member of the Marine Board of the National Research Council, and currently serves on the National Sea Grant Review Panel of NOAA. Dr. Weis has previously on the Editorial Boards of *Transactions of the American Fisheries Society* and *Bulletin of Environmental Contamination and Toxicology*. She is Currently Associate Editor *of Bulletin of Environmental Contamination and Toxicology* and on the Editorial Board of *BioScience*. Dr. Weis' sources of recent grant support include: U.S. Geological Survey - Water Resources research program; National Science Foundation - Division of Environmental Biology; NOAA, and Meadowlands Environmental Research Institute.

Inge Werner

Dr. Inge Werner holds a research faculty position (Assistant Research Toxicologist) in the Aquatic Toxicology Program of the Department of Anatomy, Physiology and Cell Biology, School of Veterinary Medicine, University of California Davis. Dr. Werner holds a master's degree in limnology, and a doctoral degree in zoology with specialization in aquatic toxicology. Dr. Werner's research interests focus on the development and application of toxicity tests using chronic endpoints, and on indicators of sublethal pollutant impacts in aquatic organisms. Her work includes aquatic monitoring programs to assess pesticide toxicity in California's Sacramento-San Joaquin watershed and delta; studies on the impact and efficacy of alternative pest control methods in orchard agriculture; assessment of the toxicity of MTBE, pesticides, and heavy metals to fish and aquatic invertebrates; and the evaluation of sublethal indicators of sediment toxicity. Dr. Werner served as meeting chair for the 2004 Annual Meeting of the Northern California Chapter of the Society of Environmental Toxicology and Chemistry, and has been a member of the Board of Directors, Northern California Chapter of the Society of Environmental Toxicology and Chemistry since January 2003. From 2001 to 2003, she served on the Executive Committee of the University of California Toxic Substances Research and Teaching Program – Ecotoxicology Lead Campus Program, at University of California Davis. She has been a technical advisor for the U.S. EPA, the San Francisco Estuary Institute, the Sea Grant Program of Virginia, the Maryland Sea Grant Program, and the Jeffress' Memorial Trust, as well as a reviewer for numerous technical journals. Her current extramural support comes primarily from the Calfed Bay Delta Authority, Ecosystem Restoration Program, Sacramento, California.

Isaac Wirgin

Dr. Isaac Wirgin is an Associate Professor in the Department of Environmental Medicine at the New York University School of Medicine in Tuxedo, New York. He has served on National Institute of Environmental Health Science (NIEHS), U.S. EPA, Superfund Basic Research Program, and Sea Grant review panels. Dr. Wirgin's expertise is in the areas of aquatic toxicology, molecular biology, and population genetics. He is particularly interested in the effects of dioxins, PCBs, and PAHs on the structure and expression of genes that are involved in the metabolism of these chemicals and in the transduction of cellular signals resulting from their exposure. Dr. Wirgin's studies on natural populations of fishes from highly polluted environments investigate the effects of these contaminants from the molecular through the population levels. His interests include the mechanistic bases of disease and other xenobiotic-induced alterations in these populations and in the development and use of biomarkers to evaluate the effects of these stressors on ecosystem health. He is particularly interested in establishing mechanistic linkages between molecular-cellular effects and those at the organismic-population levels. For several decades he has applied cutting-edge molecular approaches to aquatic models.