CONTAMINATED SOILS, SEDIMENTS, WATER AND ENERGY

Volume 17

CONTAMINATED SOILS, SEDIMENTS, AND WATER
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Heavy Metals
Indoor Air
Remediation
Risk Assessment
Sediments
Site Assessment

Selected manuscripts from the 27th Annual International Conference on
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Foreword

Way back in the mid-1980s, a small meeting in the Northeastern US was launched that was intended primarily to highlight issues related to petroleum-contaminated soils. Now known as the Annual International Conference on Soils, Sediments, Water, and Energy, that modest initial scientific forum began a very impressive run, which most recently was represented by the 27th event in October 2011. Hosted by the University of Massachusetts in Amherst, this conference is recognized as being among the most significant and influential environmental conferences in the world, and recently has drawn in the range of 200 presentations/posters, and 600 to 900 participants each year. This has translated to a total of nearly 20,000 attendees from well over 40 countries, and the United States has been represented by nearly all of the 50 states in over a quarter century.

The Conference prides itself on establishing and promoting interactions of all kinds. With important local, regional and global environmental events such as the Gulf Oil Spill, the Japanese earthquake/tsunami, and others occurring worldwide with unfortunate regularity, a conference such as this provides an essential service to the scientific community. That fact is well-illustrated by the array of subjects addressed at the 2011 Conference, which touched on such topics as site investigation approaches, innovative remedial strategies and techniques, vapor intrusion, petroleum, environmental forensics, air quality, military installations, risk assessment, heavy metals, nanotechnology, hydrogeology, manufactured gas plants, and numerous specific workshops, poster sessions and invited addresses. Also well-represented in the presentations and exhibitor booths were many analytical laboratories, technical consultants, regulatory agency personnel, and members of the legal community. This year's Proceedings, which cover indoor air quality, remediation, risk assessment, sediment quality, and heavy metals, are just a snapshot of the broad expanse of technical materials covered by the Conference. The treatment of new ideas and approaches to environmental problems, as well as possible new avenues of research and practical resolution, has always been a hallmark of the Conference, whether in the platform sessions, more informal and discussion-oriented poster sessions, or even during coffee breaks and dinner. It is in those discussions that much of the actual progress occurs and many of the intellectual connections are forged.

It is a personal and professional pleasure to introduce this latest volume in a long-running series that dates back in various forms to 1986. As in past years, the editors, sponsors, conference staff, the Scientific Advisory Boards, and the AEHS Foundation are to be congratulated on the continuation and improvements to a great and influential tradition in our field.

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About the Editors

Edward J. Calabrese is a board certified toxicologist and professor of toxicology at the University of Massachusetts School of Public Health at Amherst. Dr. Calabrese has researched extensively in the area of host factors affecting susceptibility to pollutants and has authored more than 300 papers in scholarly journals, as well as 24 books, including: Principles of Animal Extrapolation; Nutrition and Environmental Health, Vols. 1 and 2; Ecogenetic: Safe Drinking Water Act: Amendments. Regulations, and Standards; Soils Contaminated by Petroleum: Environmental and Public Health Effects; Petroleum Contaminated Soils, Vols. 1, 2 and 3; Ozone Risk Communication and Management; Hydrocarbon Contaminated Soils, Vols. 1, 2, 3, 4 and 5; Hydrocarbon Contaminated Soils and Groundwater, Vols. 1, 2, 3, and 4; Multiple Chemical Interactions; Air Toxics and Risk Assessment; Alcohol Interactions with Drugs and Chemicals; Regulating Drinking Water Quality; Biological Effects of Low Level Exposures to Chemicals and Radiation; Contaminated Soils; Diesel Fuel Contamination; Risk Assessment and Environmental Fate Methodologies; Principles and Practices for Petroleum Contaminated Soils, Vols. 1, 2, 3, 4, and 5; Contaminated Soils, Vol. 1; and Performing Ecological Risk Assessments. He has been a member of the U.S. National Academy of Sciences and NATO Countries Safe Drinking Water Committees, and the Board of Scientific Counselors for the Agency for Toxic Substances and Disease Registry (ATSDR). Dr. Calabrese also serves as Director of the Northeast Regional Environmental Public Health Center at the University of Massachusetts, Chairman of the BELLE Advisory Committee and Director of the International Hormesis Society.

Paul T. Kostecki's professional career has focused on research, education and trainingin environmental contamination with an emphasis on human and ecological risk assessment and risk management. His work includes soil ingestion estimates for children and adults; establishment of scientifically sound cleanup levels for soil; bioavailability of soil contaminants; fish as toxicological models for contamination assessment; and assessment and management of petroleum contaminated soils. Dr. Kostecki has developed and conducted over 45 conferences, workshops and courses both nationally and internationally, and has made presentations at over 100 national and international meetings. Since 1985, his conference at the University of Massachusetts Amherst on Contaminated Soils, Sediments and Water has attracted over 10,000 environmental professionals from over 40 countries. Dr. Kostecki has published over 100 articles and reports, co-edited/co-authored 25 Books and secured over $10M in research support.

Dr. Kostecki co-created the Association for Environmental Health and Sciences (AEHS) in 1989 and served as its Executive Director until 2009. In 2009, he established the AEHS Foundation. He help found Amherst Scientific Publishers and co-created seven peer-reviewed journals: Journal of Soil and Sediment Contamination (1990); Human andEcological Risk Assessment (1994); Journal of Phytoremediation (1998); Journal of Environmental Forensics (1999); Journal of Children's Health (2003); Non-Linearity Journal (2003); and Journal of Medical Risks (2004). In addition, Dr. Kostecki co-created the International Society for Environmental Forensics in 2002.

Dr. Kostecki is a Professor in the School of Public health & Health Sciences and served as Vice Provost for Research and Vice Chancellor for Research and Engagement at the University of Massachusetts Amherst from September, 2003 to August, 2009. He served as Special Advisor for the Clean Energy China Initiative, Office of the President, University of Massachusetts from 2009 – 2011. He is presently the Director for Online Education at Simmons College.

James Dragun, Ph.D., is a soil chemist with extensive experience dealing with soil remediation. He has addressed the extent, danger, and/or cleanup of chemicals at sites of national and international concern such as the oil lakes caused by the 1991 Persian Gulf War (Kuwait), VX chemical warfare agent for the U.N. Weapons Inspection Program (Iraq), malfunction of the Three Mile Island Nuclear Power Plant USA), and dioxin in Missouri (USA). Twenty-four nations including Japan, Canada, the United Kingdom, Australia, Germany, Switzerland, Italy, France, Spain, Scandinavia, and the Netherlands have utilized his expertise.

He founded and built an environmental engineering-science consulting company. For 18 years, he has led a team of specialists in chemical engineering, civil engineering, environmental engineering, geotechnical engineering, mechanical engineering, physics, plant engineering, environmental science, geology, hydrogeology, chemistry, biochemistry, toxicology, and biology. Dr. Dragun and his associates have solved environmental issues for major companies and governments in six continents (Africa, Asia, Australia, Europe, North America, and South America).

Dr. Dragun is a full Professor at the University of Massachusetts and at Wayne State University, Detroit, MI. He has authored two college textbooks and co-authored/edited eight technical books. Also, Dr. Dragun has been the Editor-in-Chief of the International Journal of Soil and Sediment Contamination for over 15 years.

Christopher Teaf is a Board-certified toxicologist with broad experience in evaluation of potential effects from chemical exposures related to industrial facilities, agriculture, waste management facilities, power generation, educational institutions, and products in general commerce. Dr. Teaf has served on the faculty of the Center for Biomedical & Toxicological Research at Florida State University since 1979, and as Director of Toxicology for Hazardous Substance & Waste Management Research since 1985.

Chris' areas of interest include risk assessments under environmental and occupational elements of federal, state or local regulations, risk communication, and development of risk-based targets to guide remedial actions. He has extensive experience in evaluation of environmental fate and potential health effects from petroleum, solvents, metals, pesticides, pharmaceuticals, biological agents (e.g., mold, microbes) and physical agents (e.g., particulates, asbestos. For over 30 years, he has directed or conducted research in environmental and occupational toxicology for the World Health Organization, NATO, U.S. EPA, U.S. Air Force, U.S. Department of Agriculture (USDA), Florida Department of Environmental Protection, Florida Department of Health, Florida Department of Community Affairs, and Agency for Toxic Substances & Disease Registry (ATSDR), among others. He served as Toxicologist for the Florida Landfill Technical Advisory Group and the state Petroleum Technical Advisory Committee. He served on the Florida Governor's Financial and Technical Advisory Committee and was Chair of the Toxic Substances Advisory Council for the Florida Department of Labor. Chris has organized and taught many graduate and undergraduate courses and technical seminars for presentation to universities as well as international, federal, state and local agencies. He has served as the Chairman of the Dog Island Conservation District since 2004.

Dr. Teaf has served on editorial boards or as peer reviewer for a variety of journals and is Senior Editor for Human Health of the international journal *Human & Ecological Risk Assessment*. In addition to training, research and advisory services to many environmental agencies and private sector firms, he has provided environmental and toxicological services to the U.S. Attorney, Florida State Attorney, and Attorneys General of FL, OK, and WA. Chris has been qualified to testify in federal and state court, as well as administrative proceedings, in a number of states regarding toxicology, health risk assessment, and environmental chemistry.

Dave Ludwig has a Bachelor's of Science from Rutgers University, a master's in Marine Ecology from the Virginia Institute of Marine Sciences, and a doctorate in ecology from the Institute of Ecology at the University of Georgia. He is a systems ecologist by training and an applied environmental scientist and restorationist by trade.

Dr. Ludwig is helping to pioneer AEHS's online learning and training program, building education infrastructure amenable to the interdisciplinary and specialty fields that are difficult for traditional institutions to accommodate. By integrating the Foundation's worldwide reputation and expertise in technical colloquia, environmental planning and policy, and interdisciplinary project leadership, the Education and Training Department is working to meet learning needs critically important for the future of environmental science and management.