Inaugural Environmental Science and Policy Program Research Symposium

Water for a Sustainable World

November 22, 2013

Kellogg Hotel & Conference Center

Michigan State University

Sponsored By:

- **Environmental Science and Policy Program**

- **The Graduate School**

- **College of Agriculture and Natural Science**

- **College of Engineering**

- **College of Natural Science**

- **College of Social Science**

On behalf of the Organizing Committee, we would like to warmly welcome you to participate in the inaugural ESPP Research Symposium: Water for a Sustainable World.

The overarching goals of this annual symposium are to 1) facilitate effective interdisciplinary water research; 2) encourage interaction between policy-makers and researchers to promote science-based decision making; and, 3) foster professional development and collaboration for students in water disciplines.

ESPP Research Symposium Platform:

Total global population is expected to reach 9 billion by 2050 and global environmental changes are increasing in pace. Answers to the problems that have been created by our relationship with nature have traditionally been sought in the sciences, but the translation from science to policy does not always follow even from deep understanding of environmental problems. At the same time, the profound impact that humans have had on the environment stresses the importance of coupling human and natural systems research. Success will depend on the engagement of a new generation of scientists who can break disciplinary boundaries and collaborate with other scientists and stakeholders to forge solutions for current and future problems. The Michigan State University Environmental Science and Policy Program (ESPP) Student Research Symposium serves as a forum that brings together social and natural scientists to highlight interdisciplinary research, foster interactions with stakeholders and policymakers, and provide professional development opportunities for tomorrow's scientific community.

Theme for 2013 Inaugural Event:

All organisms require water to survive, but humans are unique in our use of water for food, energy, manufacture, and recreation. The competing uses of water have given rise to problems across the globe regarding quantity, quality, access and supply to both humans and our environment. Our water crises have solutions that are scientific, political, and cultural, and require collaboration among many stakeholders with different skills, backgrounds, and responsibilities. The need to evaluate water issues as complex systems is increasingly expressed by policy entities, research funding sources, and the public. Water conflicts pose one of the greatest challenges for sustainability research.

Keynote Speaker: Dr. Deborah L. Swackhamer

Dr. Deborah L. Swackhamer is a Professor of Science, Technology, and Public Policy in the Hubert H. Humphrey School of Public Affairs, and Co-Director of the University's Water Resources Center at the University of Minnesota. She also is a Professor of Environmental Health Sciences in the School of Public Health. She received a BA in Chemistry from Grinnell College, IA and a MS and PhD from the University of Wisconsin-Madison in Water Chemistry and Limnology & Oceanography, respectively. After two years post-doctoral research in Chemistry and Public & Environmental Affairs at Indiana University, she joined the Minnesota faculty in 1987. She studies the processes affecting the behavior of, and exposures to, toxic chemicals in the environment and works on policies to address these potential risks.

In 2012 Dr. Swackhamer completed a four-year term as Chair of the Science Advisory Board of the US Environmental Protection Agency, and currently is a member of the Science Advisory Board of the International Joint Commission of the US and Canada. She currently serves on the National Research Council, National Academy of Sciences committee addressing Sustainability Linkages in the Federal Government. She is also a Governor appointee on the Minnesota Clean Water Council. She was President of the National Institutes of Water Resources in 2011-2012. Dr. Swackhamer is a member of the Editorial Advisory Board for the journal Environmental Science & Technology. She is a Fellow in the Royal Society of Chemistry in the UK. Dr. Swackhamer received the 2007 Harvey G. Rogers Award from the Minnesota Public Health Association. In 2009 she received the prestigious Founders Award from the Society of Environmental Toxicology and Chemistry for lifetime achievement in environmental sciences. She was the 2010 recipient of the University of Minnesota's Ada Comstock Award.

Keynote Speaker: Dr. Benito J. Mariñas

Dr. Benito J. Mariñas holds a B.S. degree (Universidad Politecnica de Madrid, Spain 1982) in civil engineering, and M.S. (University of California at Berkeley 1985), Ph.D. (University of California at Berkeley 1989) degrees in sanitary and environmental engineering. He has been on the faculty of the department of Civil and Environmental Engineering at the University of Illinois since 1995 and has been an Arthur and Virginia Nauman Faculty Scholar since 1998. Prior to coming to the University of Illinois, Dr. Mariñas was a faculty member (1989-1995) at the School of Civil Engineering of Purdue University, West Lafayette, Ind.

Dr. Mariñas has research interests in various mechanistic aspects of chemical and ultraviolet light disinfection processes and membrane technologies for the particular application of controlling waterborne pathogens. He is currently a member of the Center for Zoonoses Research at the University of Illinois. He is also developing hybrid adsorption/membrane processes for the control of pesticides, taste-and-odor-causing compounds and other water contaminants, and working on research projects aimed at elucidating the mechanisms responsible for the formation of disinfection by-products of health concern in drinking water.

Student Organizing Committee:

Abigail Lynch	Doctoral Candidate, Fisheries and Wildlife
Christopher Crock	Doctoral Student, Environmental Engineering
Ellis Adams	Doctoral Student, Geography
Erin Haacker	Doctoral Student, Environmental Geosciences

Faculty and Staff Support:

Marcy Heberer	Assistant to the Director, Environmental Science and Policy Program
Derek Moy	Outreach Specialist, Environmental Science and Policy Program
Karessa Weir	Communications and Outreach Specialist, Environmental Science and Policy Program
Dr. Erin Dreelin	Visiting Assistant Professor, Department of Fisheries and Wildlife; Associate Director, Center for Water Sciences
Dr. Joan Rose	Homer Nowlin Chair in Water Research; Co-Director, Center for Advancing Microbial Risk Assessment; Co-Director, Center for Water Sciences
Dr. Volodymyr Tarabara	Associate Professor, Department of Civil and Environmental Engineering; Associate Director, Environmental Science and Policy Program
Dr. Jinhua Zhao	Professor, Department of Economics, Agriculture, and Food and Resource Economics; Director, Environmental Science and Policy Program

Scientific Committee:

Dr. Pejman Ahmadiannamini	Postdoctoral Research Associate, Department of Civil and Environmental Engineering
Dr. David Hyndman	Professor and Chair, Department of Geological Sciences
Dr. Anthony Kendall	Research Associate, Department of Geological Sciences
Dr. Wei Liao	Associate Professor, Department of Biosystems and Agricultural Engineering
Dr. Sherry Martin	Postdoctoral Research Associate, Department of Geological Sciences
Dr. Susan Masten	Professor, Department of Civil and Environmental Engineering
Dr. Georgia Mavrommati	Postdoctoral Research Associate, Department of Fisheries and Wildlife
Dr. Jade Mitchell	Assistant Professor, Department of Biosystems and Agricultural Engineering

Dr. Pouyan Nejadhashemi	Assistant Professor, Department of Biosystems and Agricultural Engineering and Department of Crop and Soil Sciences
Dr. Dawn Reinhold	Associate Professor, Department of Biosystems and Agricultural Engineering
Dr. Joan Rose	Homer Nowlin Chair in Water Research; Co-Director, Center for Advancing Microbial Risk Assessment; Co-Director, Center for Water Sciences
Dr. Steve Safferman	Associate Professor, Department of Biosystems and Agricultural Engineering
Dr. Robert Stedtfeld	Postdoctoral Research Associate, Department of Civil and Environmental Engineering
Dr. Jan Stevenson	Professor, Department of Zoology; Co-Director, Center for Water Sciences
Dr. Warren Wood	Visiting Professor, Department of Geological Sciences
Dr. Phoebe Zarnetske	Assistant Professor, Department of Forestry
Dr. Wei Zhang	Assistant Professor, Department of Plant, Soil, and Microbial and Sciences

Discussion Panel, Opportunities in Interdisciplinary Water Research:

Dr. Erin Dreelin	Visiting Assistant Professor, Department of Fisheries and Wildlife; Associate Director, Center for Water Sciences
Dr. Stephen Gasteyer	Assistant Professor, Department of Sociology
Dr. David Hyndman	Professor and Chair, Department of Geological Sciences
Dr. Phanikumar Mantha	Associate Professor, Department of Civil and Environmental Engineering
Dr. Phoebe Zarnetske	Assistant Professor, Department of Forestry
Dr. Jinhua Zhao	Professor, Department of Economics, Agriculture, and Food and Resource Economics; Director, Environmental Science and Policy Program

Professional Development Speaker:

Dr. Karen Klomparens	Associate Provost for Graduate Education; Dean of the Graduate School

Symposium at a Glance:

9:00 am – 9:05 am	Introductory Remarks: Dr. Volodymyr Tarabara, ESPP Associate Director	Kellogg Center, Conference Room 104 A & B
9:00 am – 9:45 am	Keynote Speaker: Dr. Deborah L. Swackhamer	Kellogg Center, Conference Room 104 A & B
9:45 am – 10:00 am	Networking Coffee Break	Kellogg Center, Conference Room 104 A & B
10:00 am – 11:00 am	Student Presentations	Kellogg Center, Conference Room 104 A & B and Conference Room 106
11:00 am – 12:00 pm	Panel Discussion: Opportunities in Interdisciplinary Water Research	Kellogg Center, Conference Room 104 A & B
12:00 pm – 1:00 pm	Professional Development Lunch for Graduate Students - Dean Karen Klomparens (MSU Graduate School)	Kellogg Center, Centennial (ABC) Room
1:00 pm – 3:00 pm	Student Presentations	Kellogg Center, Conference Room 104 A & B and Conference Room 106
3:00 pm – 3:15 pm	Networking Coffee Break	Kellogg Center, Conference Room 104 A & B
3:15 pm – 4:30 pm	Student Presentations	Kellogg Center, Conference Room 104 A & B and Conference Room 106
4:30 pm – 5:15 pm	Keynote Speaker: Dr. Benito J. Mariñas	Kellogg Center, Conference Room 104 A & B

Student Presentations:

10:00 am – 11:00 am	Water Quality and Health 1A	Conference Room 104 A & B
10:00 AM	Sorption of Lincomycin by Biochar Produced from Different Feedstock	Cheng-Hua Liu
10:15 AM	Metagenomic Analysis of Viral Communities Associated with Fresh Produce and Irrigation Water	Samantha Wengert
10:30 AM	A Comparative Analysis of Detection Techniques for *Salmonella* in Surface Waters	Mathew Flood
10:45 AM	Uptake of Antimicrobial Agent Triclocarban in Vegetable Crop Plants	Khang Huynh
10:00 am – 11:00 am	Water Quality and Health 1B	Conference Room 106
10:00 AM	Microbial Quality and Safety of Well Water in Rural Nicaragua as Determined by Low Cost Bacterial Test	Patricia Weiss
10:15 AM	Examining the Causes of Diarrheal Related Deaths in Africa in 2004 and 2008	Saul Ddumba
10:30 AM	Ozonation Followed by Adsorption for the Removal of Atrazine	Elaheh Esfahanian
10:45 AM	Identification of Aerobic Vinyl Chloride Degraders in Groundwater Microcosms by Combining Stable Isotope Probing (SIP) and Illumina Sequencing	Fernanda Paes
1:00 pm – 3:00pm	Detection, Treatment, and Modeling Technologies 2A	Conference Room 104 A & B
1:00 PM	How Scalable Are Flows Through Bioreactors?	Rohan Maddamsetti
1:15 PM	Anti-Adhesive Membrane Coating for Virus Recovery for Rapid Detection	Hang Shi
1:30 PM	Water and Biohydrogen Production	Hui Yang
1:45 PM	Mechanisms of Membrane-Based Separations of Oil-Water Emulsions	Emily Tummons
2:00 PM	Improving Root Distribution Models Through a Novel Coupled Hydrogeophysical Approach	Alexandria Kuhl
2:15 PM	A Numerical Study of the Efficient Microfiltration of Oil-In-Water Emulsions Using Porous Membranes	Tohid Darvishzadeh
2:30 PM	Effectiveness of the AGIS Process on Fats, Oil, and Grease	Younsuk Dong
2:45 PM	Effect of Anionic and Cationic Surfactants on Nanoparticle Aggregation	Xiaohang Yu
1:00 pm – 3:00pm	Freshwater Resources and Security 2B	Conference Room 106
1:00 PM	A Water Sustainability Hazard for Michigan's Coastal Communities	Zachary Curtis
1:15 PM	Stormwater Management Monitoring and Development on Michigan State's Campus	Rebecca Bender

1:30 PM	Molecular Measurements from Sediments Cores in Lake St. Clair Linking Pollution and Watershed Management.	Yolanda Brooks
1:45 PM	Phenotypic and Genotypic Diversity of *Pseudomonas* and *Aeromonas* of the Red Cedar River	Karen Davidge
2:00 PM	The Speciation of Copper in Sediment and Water of Copper Mining-Impacted Lake: Role of Dissolved Organic Compounds for Controlling Copper Solubility of Lake	Chaiyanum Tangtong
2:15 PM	Phages Metagenome in Activated Sludge Samples	Mariya Munir
2:30 PM	Human and Bovine Viruses and *Bacteroides* as Microbial Source Tracking Tools in Selected Great Lake Beaches	Ziqiang Yin
2:45 PM	Chlorophyll Concentration Response to Zebra Mussel Invasion in the Great Lakes	Shengpan Lin
3:15 pm – 4:30 pm	Sustainability, Policy, and Governance 3A	Conference Room 104 A & B
3:15 PM	A Metagenomic Insight into Ballast Water Virome: First Step to Prevent The Introduction and Spread of Invasive Species in Ballast Water	Yiseul Kim
3:30 PM	Reducing Lake Erie Algal Blooms: Agricultural Runoff Abatement Policies That Integrate Economic and Ecological Information	Leah Harris
3:45 PM	Testing an Integrated Approach for Water Sustainability Assessment in Megacities	Jillian Deines
4:00 PM	Predicting the Impacts of Climate Change on Agricultural Yields and Water Resources in the Maumee River Watershed	Ryan Nagelkirk
4:15 PM	Modeling Regional Groundwater Implications of Biofuel Crop Production in the Great Lakes Region	Austin Parish
3:15 pm – 4:30 pm	Sustainability, Policy, and Governance 3B	Conference Room 106
3:15 PM	Transport and Retention of *Phytophthora capsici* Zoospores in Saturated Iron Oxide Coated-Sand and Uncoated-Sand	Sangho Jeon
3:30 PM	Environmental Monitoring and Enforcement: Toward Proactive Fraud Detection	Matt Gammans
3:45 PM	Determinants of Agricultural Landowners' Decision to Enroll in Conservation Reserve Enhancement Program in Saginaw Bay	Felix Yeboah
4:00 PM	Threats to the Sustainability of Water Recreation in The Great Lakes	Dwight Washington
4:15 PM	Social Learning and Irrigation Technology Adoption in Ogallala Aquifer Management: A Drift-Diffusion Approach	Li Cheng