2016 ESPP Research Symposium

ENVIRONMENTAL HEALTH

Friday, November 11, 2016
Kellogg Hotel and Conference Center

Organized by ESPP Graduate Fellows and showcasing oral and poster presentations of graduate student research projects

About the ESPP Research Symposium

This symposium is a student organized event which brings together students from a range of disciplines across MSU campus and beyond to present their research in a public forum and explore interdisciplinary collaboration between graduate students, faculty, and community stakeholders. One of the unique attributes of this conference is that it is organized with direct participation of students: of the eight members of the symposium planning committee, four are graduate students representing different MSU Colleges.

The Symposium series has been designed with the following three objectives in mind:

- To promote environmental research at MSU and Great Lakes region with the special emphasis on supporting students and recognizing student success.
- To create an interdisciplinary forum for students and faculty from various MSU Colleges to network and showcase their research in the area of environment.
- To ascertain and promote MSU's role as a regional and national leader in environmental science and policy across MSU's research, education, and outreach missions.

Previous Symposia focused on the topics of International Research, Environmental Risk and Decision Making , and Water for a Sustainable World. See presentations from past symposia at environment.msu.edu/events/research_symposium/2016/index.php

2016 ESPP Research Symposium

Environmental Science and Policy Program

Dr. Jinhua Zhao
Director
Dr. Vlad Tarabara
Associate Director

2016 Planning Committee Members:
Pouyan Hatami (Biosystems and Agricultural Engineering)
Charifa Hejase Bazzi (Environmental Engineering)
Monica List (Philosophy)
Qiong (Joan) Zhang (Geography, Environment and Spatial Sciences)

Faculty advisors to the committee:
Dr. Laura Cabrera (Center for Ethics and Humanities in the Life Sciences)
Dr. Sue Grady (Geography, Environment and Spatial Sciences)
Dr. Terence Marsh (Microbiology and Molecular Genetics)
Dr. Jade Mitchell (Biosystems and Agricultural Engineering)

Judges:
Dr. Jade Mitchell (Biosystems and Agricultural Engineering)
Dr. Terence Marsh (Microbiology and Molecular Genetics)
Dr. Sue Grady (Geography, Environment and Spatial Sciences)
Dr. Sina Akram (Biosystems and Agricultural Engineering)
Dr. Umesh Adhikari (Biosystems and Agricultural Engineering)
Libbey Kutch (Geography, Environment and Spatial Sciences)

Additional Support

Marcy Heberer, ESPP
Karessa Weir, ESPP
Thrishika Balasubramanian, ESPP
Kera Howell, ESPP
Mitch Lindstrom, ESPP
Derek Moy, RS&GIS

Symposium Schedule at a glance

Time	Events	Location
8:00 - 8:45	Registration and Breakfast	Lincoln Lobby
8:45 - 8:50	Welcome Notes	Lincoln
8:50 - 9:50	Student Session 1: Community Sustainability	Lincoln
9:50 - 10:00	Coffee Break	Lincoln
10:00 - 11:00	Plenary #1 Dr. Amy Pruden "Lead and Legionella: How Lessons Learned From Flint, MI, Can Improve Water Infrastructure and Protect Public Health	Lincoln
11:00- 12 p.m.	Student Session 2: Infectious Diseases	Red Cedar
12:00 - 1:00	Lunch	Lincoln
1:00 - 2:00	Plenary #2: Dr. Kellogg Schwab "Public Health and Water Availability, Treatment, and International Needs "	Lincoln
2:00 - 2:50	Poster Session	Lincoln Lobby
2:50 – 3:00	Coffee Break	Red Cedar AB
3:00 - 4:00	Plenary #3: Dr. Joe Messina "Neglected Tropical Diseases, Climate Change, and the Pursuit of Eradication: the case of African Trypanosomiasis"	Red Cedar AB
4:00 - 4:50	Student Session 3: Chemical Contamination	Red Cedar AB
4:50 - 5:00	Concluding Remarks	Red Cedar AB

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Joe Messina
Michigan State University

Dr. Joe Messina is Professor of Geography, Environment, and Spatial Sciences, and Associate Dean of Research at Michigan State University. Dr. Messina's research focuses broadly upon Medical Geography, Land Use and Land Cover Change (LULCC) and the techniques and theoretical models that allow one to explore the spatio-temporal dynamics of change.

Title: **Neglected Tropical Diseases, Climate Change, and the Pursuit of Eradication: the Case of African Trypanosomiasis**

Abstract: African trypanosomiasis, otherwise known as sleeping sickness in humans and nagana in animals, is a parasitic protist passed cyclically by the tsetse fly. Despite more than a century of control and eradication efforts, the fly remains widely distributed across Africa. One of eighteen diseases classified as a neglected tropical disease by the World Health Organization, African Trypanosomiasis is one of four diseases targeted for elimination. However, disease management is hampered by spatially and temporally variant vector distributions, ecologically irrelevant boundaries, and neglect. Tsetse are particularly well suited to move into previously disease-free areas under climate change scenarios, placing unprepared populations at risk. Here I present the modeling framework ATcast, which combines a dynamically downscaled regional climate model with a temporally and spatially dynamic species distribution model to predict tsetse populations over space and time. I also discuss the prospects for unconventional control methods, control success probability, and challenges faced by public health agencies fighting neglected tropical diseases.

Amy Pruden
Virginia Tech

Dr. Amy Pruden is the W. Thomas Rice Professor in the Department of Civil and Environmental Engineering and the Associate Dean and Director of Interdisciplinary Graduate Education in the Graduate School at Virginia Tech. Her research program focuses on applied environmental microbiology. In relation to global change, Dr. Pruden studies the role of microbial communities in dynamic environmental systems. For example, there is currently a boom in the manufacture of nanomaterials, and therefore a need to understand the implications of these new products in terms of biodegradability by and toxicity to microbes in wastewater treatment plants.

Title: **Lead and Legionella: How Lessons Learned from Flint, MI Can Improve Water Infrastruce and Protect Public Health**

Abstract: In recent years, our nation's water infrastructure has repeatedly earned grades of D or lower from the American Society of Civil Engineering. Recently, the lead-in-water crisis in Flint MI has suddenly brought awareness about the threat this poses to public health and is galvanizing significant action and investment towards addressing the problem. This comes at a time when drinking water systems are already facing new challenges, such as antibiotic resistance and opportunistic pathogens as emerging contaminants that grow within the pipe biofilms themselves and the push for sustainable water systems that conserve and reuse water. Here we will examine the collision course of deteriorating water infrastructure, emerging public health challenges, advances in molecular monitoring capabilities, and demand for action in mapping out the future course for water infrastructure in the US.

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Kellogg Schwab
Johns Hopkins University

Dr. Kellogg Schwab, Professor in the Department of Environmental Health and Engineering at the Johns Hopkins University Bloomberg School of Public Health and Director of the JHU Water Institute. His research focuses on environmental microbiology and engineering with an emphasis on the fate and transport of pathogenic microorganisms in water, food and the environment.

Title: **Public Health and Water Availability, Treatment, and International Needs**

Abstract: The world faces critical issues relating to water as the result of human pressures and climate trends. In short, we need to answer the following critical question: "How can we provide better prediction and management of water quantity and quality for the sustained health of mankind and ecosystems, now and for future generations?" In meeting this challenge, we must think and act both locally and globally to undertake integrated research that will lead to sustainable global solutions. Only new integrated and evidence-based approaches will find efficient and sustainable solutions for the diverse array of complex global water problems. This seminar will highlight water resources and needs both domestically and internationally. Approaches to improve monitoring and evaluation, key aspects for successful, long-term interventions will also be discussed.

Student Presentations

Student Session 1: Community Sustainability

Laura Castro-Diaz (Community Sustainability):
"Downstream Fishers and the Impact Generated by the Belo Monte Hydroelectric Dam"

Unai Miguel Andres (Ball State University, Urban Planning):
"Biophilic Characteristics of Asian Metropolitan Areas: A Case Study of Seoul, Korea"

Aldo Gonzalez (Community Sustainability):
"Community Empowerment and Institutions for Sustainable Management of the Commons in Cherán, Michoacán Mexico"

Aniseh Bro (Community Sustainability):
"Adaptive Capacity to Climate Change: Estimating Producers' Preferences for Crop Diversification in the Coffee Sector of Nicaragua"

Edgar Castro-Aguirre (Packaging):
"Biodegradable Plastics: Creating an Opportunity for Diverting Plastic Waste from Landfills and Reducing Groundwater Contamination"

Student Session 2: Infectious Diseases

Ammar Safaie (Civil & Environmental Engineering):
"Application of Statistical and Mechanistic Models of Escherichia coli to Detect Beach Contamination"

Heather Miller (Microbiology & Molecular Genetics):
"Microbiological Profile of Garden Soils from Flint, Michigan"

Hang Shi (Civil & Environmental Engineering):
"Recovery of Human Adenovirus 40 from Tap and Surface Water by Crossflow Ultrafiltration: Experimental Determination and XDLVO Predictions Based on Virion Characterization"

Matlhogonolo Bene (Geography, Environment and Spatial Sciences):
"HIV and ARV Uptake in Urban, Peri-Villages and Rural Environments in Botswana"

Huiyun Wu (Civil & Environmental Engineering):
"First-Flush Study of Fecal Bacterial Pollutants in Red Cedar River"

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Poster Session (Lincoln Lobby)

Leann Lerie Matta (Biosystems and Agricultural Engineering):
"Development of Rapid 'Dip-Stick' Detection of Pathogenic Bacteria in Water"

Fariborz Daneshvar (Biosystems and Agricultural Engineering):
"Climate Change Impacts on Macroinvertebrate Communities in the Saginaw River Watershed"

Shengpan Lin (Integrative Biology):
"How Sick is Our Environment to be Called 'Sick'? Tipping Points of Harmful Algal Blooms for Public Perceptions andLegislations

Marten Hawkins (Human Medicine):
"Sleeping Apnea Screening Practices During DOT Exams"

Hien Dang (Civil & Environmental Engineering):
"Kinetics of Bacteriophage MS2 Deposition onto Polyelectrolyte-coated Surfaces"

Randy Bitrus (Human Medicine):
"Patients with Limited English Proficiency and Use of Professional Interpreter Services in the Emergency Department"

Judith Namanya (Geography, Environment and Geospatial Technology):
"Rainwater Harvesting: A Potential for Reducing Water & Food Insecurity

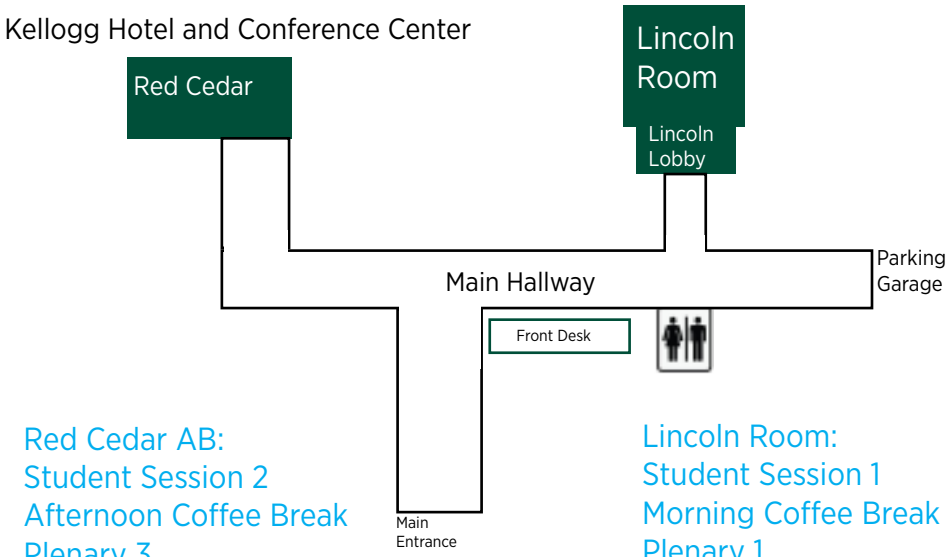
Student Session 3: Chemical Contamination

Andrew Gerard (Community Sustainability):
"Environmental Risks and Sustainability Practices in the Specialty Coffee Sectors of Rwanda and Burundi"

Zachary Curtis (Civil & Environmental Engineering):
"Sources of Elevated Cl Concentrations in the Lower Peninsula of Michigan: An Integrated Multiscale Water Quantity-Quality Analysis"

Xiaoyan Li (Civil & Environmental Engineering):
"A Low Cost and Fast Tap Water Quality Test Method: Coffee Ring Effect"

Daniel Langlois (Small Animal Clinical Services):
"Investigation of Blood Lead Levels of Dogs Living in Flint, Michigan"



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for the next FATE OF THE EARTH symposium

Climate-Food-Energy-Water Nexus

hosted by ESPP

environment.msu.edu/fateoftheearth.php

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