Mark H. Weir EIT Ph.D.
Assistant Professor
Division of Environmental Health Sciences, College of Public Health
The Ohio State University, 1841 Neil Ave, Cunz Hall - 426, Columbus, OH, 43210
E-mail: weir.95@osu.edu; Telephone: 001-614-292-4066

PROFESSIONAL PREPARATION:

Environmental Engineering, PhD. Drexel University, 2009
Concentrations: Environmental and engineered systems modeling, Quantitative Microbial Risk Assessment (QMRA)
Dissertation: Development of Physiologically Based Pathogen Transport and Kinetics Model for Inhalation of *Bacillus anthracis* Spores

Environmental Engineering, B.S. Wilkes University, 2004
Concentrations: Novel water treatment, water distribution modeling, design
Published Senior Project: Modeling Leakage Reduction Through Pressure Control

PROFESSIONAL POSITIONS:

Assistant Professor *Aug 2016 - Current*
Division of Environmental Health Sciences, College of Public Health
The Ohio State University

Senior Lecturer *Nov 2016 - Current*
College of Medicine
Griffith University

Assistant Professor *Feb 2017 - Current*
Mel and Enid Zuckerman College of Public Health
University of Arizona

CTO & Senior Research Engineer *Oct 2012 - Current*
CAMRA Consultants LLC.

Acting Director of Environmental Health Division *Dec 2013 - July 2016*
Division of Environmental Health Department of Epidemiology and Biostatistics
Temple University

Assistant Professor *Oct 2012 - July 2016*
Division of Environmental Health Department of Epidemiology and Biostatistics
Department of Civil and Environmental Engineering
Temple University

Environmental Engineer *Sept 2011 - Sept 2012*
Office of Water, United States Environmental Protection Agency

Associate Director & **Visiting Research Associate** *Sept 2009 - Sept 2011*
Center for Advancing Microbial Risk Assessment (CAMRA), Department of Fisheries and Wildlife
Michigan State University

Graduate Assistant *Sept 2004 - Sept 2009*
Department of Civil Architectural and Environmental Engineering, Drexel University

Co-Instructor *Sept 2005 - May 2009*
Department of Civil Architectural and Environmental Engineering, Drexel University

Teaching Assistant *Sept 2005 - May 2009*
Department of Civil Architectural and Environmental Engineering, Drexel University

Project Engineer *Feb 2005 - May 2007*
Water and Wastewater and Hazardous Materials Divisions, Gannett Flemming

Laboratory Assistant *Sept 2000 - Dec 2003*
Department of Environmental Engineering and Earth Sciences, Wilkes University

PUBLICATIONS

Journals

Published or Accepted

26. Dean, K. **Weir, M.H.**, Mitchell, J. (2019) Development of a Dose-Response Model for *Naegleria fowleri*. Journal of Water and Health. 17(1): 63-71

25. Mraz, A.L., **Weir, M.H.**, Nappier, S., Haas, C.N. (2018) Dose Response Models for Eastern, Western and Venezuelan Encephalitis Viruses in Mice - Part I: Baseline Dose Response and Inference of Effects of Host Age. Microbial Risk Assessment. Accepted

24. Mraz, A.L., **Weir, M.H.**, McLaughlin, P (2018) Efficacy of anuran trapping and monitoring techniques in the tropical forests of Bioko Island, Equatorial Guinea. Amphibia-Reptilia. **39** 4

23. Mraz, A.L. **Weir, M.H.** (2018) Knowledge to Predict Pathogens: *Legionella pneumophila* Lifecycle Critical Review Part I Uptake into Host Cells. Water. 102:132

22. Hamilton, K.A., Chen, A., Johnson, E.dG., Gitter, A., Kozak, A., Niquice, C., Zimmer-Faust, A.G., **Weir, M.H.**, Mitchell, J., Gurian, P. (2018) Salmonella risks due to consumption of aquaculture-produced shrimp. Microbial Risk Analysis. **9**: 22-32

21. **Weir, M.H.**, Mraz, A.L., Nappier, S., Haas, C.N. (2018) Dose Response Models for Eastern, Western and Venezuelan Encephalitis Viruses in Mice - Part II: Quantification of the Effects of Host Age on the Dose Response. Microbial Risk Assessment. **9**: 38-54

20. Brouwer, A., **Weir, M.H.**, Eisenberg, M., Eisenberg, J. (2017) Dose-Response Relationships for Environmentally Mediated Infectious Disease Transmission Models. PLOS Computational Biology. 13(9): e1005765

19. Rosen, M.B., Pokhrel, L.R. and **Weir, M.H.** (2017) A Discussion About Public Health, Lead and *Legionella pneumophila* in Drinking Water Supplies in the United States. Science of the Total Environment. **15**(590-591): 843-852

18. **Weir, M.H.**, Mitchell, J., Flynn, W.K., Pope, J.M. (2017) Development of a Microbial Dose Response Visualization and Modeling Application for QMRA Modelers and Educators. Environmental Modeling and Software. **88**: 74-83

17. Pokhrel, L.R., Ettore, N., Jacobs, Z.L., Zarr, A., **Weir, M.H.**, Scheuerman, P.R., Kanel, S.R., Dubey, B. (2017). Novel carbon nanotube (CNT)-based ultrasensitive sensors for trace mercury(II) detection in water: A review. Science of the Total Environment. **574**: 1379-1388

16. Hamilton, K.A., **Weir, M.H.**, and Haas, C.N. (2017) "Dose response models and a quantitative microbial risk assessment framework for the Mycobacterium avium complex that account for recent developments in molecular biology, taxonomy, and epidemiology. Water Research. **109**: 310-326

15. **Weir, M.H.**, Shibata, T., Masago, Y., Cologgi, D., Rose, J.B. (2016) Effect of Surface Sampling and Recovery of Viruses and Non-Spore-Forming Bacteria on a Quantitative Microbial Risk Assessment Model for Fomites Environmental Science and Technology. **50**(11): 5945-5952

14. Alvarez, S.R., **Weir, M.H.**, Pope, J.M. Seghezzo, L., Rajal, V.B., Salusso, M., Moraña, L. (2015) Development of a Relative Risk Model for Drinking Water Regulation and Design Recommendations for a Peri Urban Region of Argentina. International Journal of Hygiene and Environmental Health. **218**(7): 627-638 doi:10.1016/j.ijheh.2015.06.007

13. Breuninger, K., **Weir, M.H.** (2015) Nested Dose Response Models for *Mycobacterium paratuberculosis* in Drinking Water for Humans and Cattle. Risk Analysis. doi: 10.1111/risa.12380

12. Teske, S.S., **Weir, M.H.**, Bartrand, T.A., Huang, Y., Tamrakar, S.B., Haas, C.N. (2014) Dose Response Models Incorporating Aerosol Size Dependency for *Francisella tularensis*. Risk Analysis doi: 10.1111/risa.12160

11. Coulliette, A.D., Enger, K.S., **Weir, M.H.** (2013) Risk Reduction Assessment of Waterborne *Salmonella* and *Vibrio* by a chlorine contact disinfectant Point-of-Use Device. International Journal of Hygiene and Environmental Health. 216: 355-361

10. **Weir, M.H.**, Razzolini, M.T.P, Masago, Y., Rose, J.B. (2011) Water Reclamation Redesign For Reducing *Cryptosporidium* Risks At A Recreational Spray Park Using Stochastic Models. Water Research **45**(19): 6505-6514

9. **Weir, M.H.**, Haas, C.N. (2011) Development of the First of a Two Stage Mechanistic Dose Response Model: Effect of Delivered Dose on the Dose Response of *Bacillus anthracis*. Environmental Science and Technology 45(13): 5828-5833

8. Teske, S.S., Huang, Y., **Weir, M.H.**, Bartrand, T.A., Tamrakar, S.B., Haas, C.N. (2011) Animal and Human Dose-Response Models for *Brucella* Species. Risk Analysis 31(10): 1576-1596

7. Razzolini, M.T.P, **Weir, M.H.**, Rose J.B., (2011) Risk of *Giardia* Infection in a Peri-Urban Area Drinking Water Supply in Sao Paulo, Brazil. International Journal of Environmental Health 21(3): 222-234
6. Watanabe, T., Bartrand, T.B., **Weir, M.H.**, Haas, C.N. (2010) Development of a Dose-Response Model for SARS Coronavirus. Risk Analysis 30(7): 1128-1138
5. **Weir, M.H.** and Haas, C.N (2009). Quantification of the Effects of Age on the Dose Response of *Variola major* in Suckling Mice. Human and Ecological Risk Assessment. 15 (6): 1245-1256
4. Huang, Y., Bartrand, T.A., Haas, C.N., **Weir, M.H.** (2009). Incorporating Time Post Inoculation into a Dose Response Model of *Yersinia pestis* in Mice. Journal of Applied Microbiology. 107(3): 727-735
3. Bartrand, T.A., Haas C.N., **Weir, M.H.** (2008). Dose Response Models for Inhalation of *Bacillus anthracis* Spores: Interspecies Comparisons. Risk Analysis. 28(4): 1115-1124
2. Bartrand, T.A., **Weir, M.H.**, Haas, C.N. (2007). Advancing the Quality of Drinking Water: Expert Workshop to Formulate a Research Agenda. Environmental Engineering Science 24(7): 863-872.
1. Walski, T., Bezts, W., Posluszny, E.T., **Weir, M.H.**, Whitman, B.E. (2006). Modeling Leakage Reduction Through Pressure Control. Journal AWWA 98(1): 147-155.

Under Revision or Review

4. Kopec, K., **Weir, M.H.** (under revision) A Combined Growth and Persistence Model for *Legionella pneumophila* in Biofilms Using Simulative Techniques. Environmental Science and Technology.
3. **Weir, M.H.** (under revision) New Method for Dose Response Model Optimization for Uncertain Pathogens in Drinking Water - Case Study Norovirus. Water Research
2. **Weir, M.H.**, Mraz, A.L., Mitchell, J. Assessment of Health Risks Associated with *Legionella pneumophila* From Drinking Water Infrastructure in Hospitals.
1. **Weir, M.H.**, Amer, A. Knowledge Linkages to Achieve Health Protection Goals: Engineering Learning from Immunology to Reduce *Legionella pneumophila* Risks. Water Research

Conference Proceedings

6. **Weir, M.H.**, Mitchell, J., Libarkin, J., Mraz, A.L. (2017) QMRA Wiki: An Educational Tool for Interdisciplinary Teaching of Risk Modeling in Engineering Curricula. Proceedings of the 2017 ASEE Annual Conference and Exhibition, Columbus, OH, USA. 25 - 28 June 2017. Perm URL: https://peer.asee.org/27787
5. Adhikari, U., Mitchell, J., Libarkin, J., **Weir, M.H.** (2017) Measuring the success of an educational program through box-and-arrow diagram: A case study of the Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Proceedings of the 2017 ASEE Annual Conference and Exhibition, Columbus, OH, USA. 25 - 28 June 2017. Perm URL: https://peer.asee.org/28659

4. Mitchell, J., **Weir, M.H.**, Libarkin, J., Rose, J.B. (2017) The Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III)âĂŞA Platform for Cross Disciplinary Training of Engineers with Social and Biological Scientists to Address Public Health Issues. Proceedings of the 2017 ASEE Annual Conference and Exhibition, Columbus, OH, USA, 25 - 28 June 2017. Perm URL: https://peer.asee.org/28995

3. Mitchell, J., **Weir, M.H.**, van Osch, W., Rose, J.B. (2014) The QMRA Wiki: A Social Media Tool for Interdisciplinary and Interagency Collaboration for Quantitative Microbial Risk Assessment. Proceedings of the 7th International Congress on Environmental Modelling and Software, June 15-19, San Diego, CA, USA. 15 - 19 June 2014. ISBN: 978-88-9035-744-2

2. Rose, JB., **Weir, MH.** (2010) Theoretical Modeling Approaches to Investigating the Spread of Disease in Airports and in Aircraft: Characterizing the Risk of Tuberculosis in Commercial Aircraft by Using Quantitative Microbial Risk Assessment. Proceedings of the Research on the Transmission of Disease in Airports and on Aircraft: A Symposium, Washington DC, 17 Sept 2009

1. Walski, T., Bezts, W., Posluszny, E.T., **Weir M.**, Whitman, B. (2004) Understanding the Hydraulics of Water Distribution System Leaks. Proceedings, Critical Transitions in Water and Environmental Resources Management, Salt Lake City, UT, 27 June - 1 July 2004

Book Chapters

3. **Weir, M.H.** Microbial Risk Assessment: Dose Response Characterization. in Manual of Environmental Microbiology (2016) ASM Press

2. Zarri, A., Pokhrel, L.R., Dubey, R., Scheuerman, P.R., Strongin4, D.R., **Weir, M.H.**, Andersen, C.P., Rygiewicz, P., Kanel, S.R. Carbon Nanotube (CNT)-Based Novel Sensors for Mercury (II) Detection in Water. in Nanotechnology in Food Industry, Volume VIII: NanoBioSensors (2016) Springer.

1. Pope, J.M., **Weir, M.H.**, Rose, J.B., History of Water and Health. in The Evolution of Water Supply Through the Millennia (2012) International Water Association. ISBN: 9781843395409

FUNDED PROPOSALS

Mark H. Weir (Co-Principal): The assessment and management of risk from non-typhoidal salmonella and diarrheagenic escherichia coli in raw dairy and beef in Ethiopia (TARTARE). The Bill and Melinda Gates Foundation. $3.9 million (1 January 2019 - 31 December 2022)

Mark H. Weir (Principal): Combined Surface Sampling and QMRA Modeling Optimize Surface Cleaning Targeted HAI Reduction. Centers for Disease Control and Prevention. $510,000 (1 October 2018 - 30 September 2019

Mark H. Weir (Principal): Development of QMRA Modeling Capacity and *Legionella pneumophila* Risk Model Development. National Sanitation Foundation International. $153,000 (1 January 2017 - continuous)

Mark H. Weir (Principal): QMRA III - Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. National Institutes of Health, $978,000 R25GM108593 (1 Nov 2014, 5 years)

Mark H. Weir (Co-Principal): An Integrated Strategy to Improve Green Infrastructure Approaches in Philadelphia. Environmental Protection Agency, $1,000,000 (EPA-RD-83555701-0, 1 Jan 2014, 4 years)

Mark H. Weir (Principal): Sustainable Sanitation: Non-Western Approaches to Enhance Pathogen Control from Human Excreta. Proctor and Gamble Inc., Mead Johnson Inc. $600,000 (1 March 2014, 3 years)

Mark H. Weir (Principal): Disinfection and Pretreatment Proposed Redesign for Increased Variable Water Quality Parameters and Pathogenic Microorganisms. Alberta - Minister of Environmental and Sustainable Resource Development $15,000 (1 Dec 2014 - July 2015)

Mark H. Weir (Principal): Stochastic Modeling of Hazardous Material Transport and Detection in Urban Gardens and Small Scale Agriculture. Proctor and Gamble Inc. $400,000 (1 Oct 2013, 2 years)

Mark H. Weir (Principal): Design and Evaluation of Sustainable Stormwater Infiltration Structures for Hazardous Waste Control. CH2M Hill Australia, $40,000 (Sept 2011 - March 2012)

Mark H. Weir (Co-Principal): Forecasting Beach and Nearshore Health Effects Using QMRA. The Great Lakes Restoration Initiative, Environmental Protection Agency, $65,000 (September 2010 - Sept 2012)

Mark H. Weir (Principal): Development of a Physiologically Based Pathogen Transport and Kinetics Model for Inhalation of Pathogens. Sponsored by the Department of Homeland Security, Science and Technology Directorate $20,000 (Sept 2008 - Aug 2010)

RESEARCH CONSORTIA FOUNDED

International Public Health Risk Analysis Consortium (PHRAC)
CoFounder with Marc Verhougstraete Ph.D. of University of Arizona, and Jesse Miller Ph.D. of NSF International. Founded in 2017 with the mission of impact-focused international health-based risk research collaboration and community level emergency response.
Accomplishments to date:

- Initiation of surface sampling and modeling initiation project
- Development of QMRA best practices guidelines and guiding documents

Healthcare Infection Transmission Systems HITS
Founder and board officer since 2017. Founded with primary leadership from Christine Greene Ph.D. of NSF International. Mission is to develop collaborative fundamental and applied research in an international and non-competitive environment to work towards the elimination of healthcare associated infections.
Accomplishments to date:

- First conference hosted in Ann Arbor in 2017 - 150 attendees, over 3 days
- Establishment of working groups in 2017 to target research funding options
- Chair of Water Working Group - Mark H. Weir Ph.D.

CoChair of Risk Working Group - Mark H. Weir Ph.D.

Quantitative Microbial Risk Assessment (QMRA) Wiki - **QMRAWiki**
CoFounder with Jade Mitchell Ph.D. of Michigan State University. The QMRAWiki is a combination of a QMRA social network and data/model repository with learning modules contained within.
Accomplishments to date:

Completion of microbial dose-response data and model compendium
Establishment of the QMRA research and learning apps and tools
Expansion to 200 unique non-bot members and users
Linkage with NIGMS R25 QMRA institute

PROFESSIONAL LICENSURE

Engineer in Training, Pennsylvania. Issued on 12 April 2003, License Number ET004493

FACULTY MENTORED

Lok Pokhrel, Ph.D. Environmental nanomaterials in water quality technology, research and environmental health and engineering instruction

Heather Murphy, Ph.D. Environmental monitoring and exposure modeling in drinking water and WASH, environmental health instruction

Susan Mirlohi, Ph.D. Environmental health instruction and training

STAFF MENTORED

Uma Nair, Ph.D. Environmental exposures to cigarette and e-cigarette smoke/vapor

Michael O. Ryan, Ph.D. Source water monitoring and treatment design evaluation

William Flynn. Environmental modeling and software development for multiple audiences

STUDENTS MENTORED

Ph.D.

Advisor and Committee Chair - David Hibler Environmental Health Sciences (2021), The Ohio State University. Thesis: Mechanistic Modeling of Disinfection Kinetics for Antimicrobial Resistant and Standard Strains of Premise Plumbing Pathogens.

Advisor and Committee Chair - Pattama Ulrich, Environmental Science (2021), The Ohio State University. Thesis: Use of Natural and Anthropogenic Beaver Dams for Nutrient Control for Surface Water Protection.

Advisor and Committee Chair - Alexa L. Mraz, Environmental Health Sciences (2019), The Ohio State University. Thesis: Modeling the Lifecycle of *Legionella pneumophila* in Biofilms and the Human Lung

Advisor and Committee Member - Sonya Kozak, Environmental Health (2019), Griffith University, Queensland Australia. Thesis: Development and Validation of a Method to Couple Microbial Source Tracking and Risk Assessment for Recreational Exposures

Advisor and Committee Chair - Katherine Pokiniewski, Virology and Immunology (2018), Temple University. Thesis: Development and Evaluation of a Continuous Dose Risk Model for Pre-term Births in African American Women

Advisor and Committee Member - Soledad R. Alvarez, Water Engineering (2017), Universidad Nacional de Salta, Salta Argentina. Thesis: Use of Risk Analysis in Water Reuse System Design and Optimization

Committee Member - Kerry Hamilton, Environmental Engineering (2016), Drexel University. Thesis: Sustainable Stormwater Infrastructure Health Based Development and Design for Uncertain Protozoan and Bacterial Concentrations

Post-Doctoral Researcher

Kerry Hamilton, Ph.D. (2016 - 2018) Environmental modeling of *Legionella pneumophila* in drinking water biofilms

Umesh Adhikari Ph.D. (2015 - 2017) Environmental Engineering, Michigan State University. Research topic: Evaluation of a Novel QMRA Instructional Program for Non-Quantitative Scientists.

Amanda Herzog Ph.D., (2014 - 2015) Environmental Engineering, Michigan State University. Research topic: Novel rapid QMRA modeling of continuous doses of multiple pathogens.

Kyle Enger Ph.D., (2012 - 2014) Environmental Epidemiology, Michigan State University. Research topic: Rapid decision analytics and support for health care workers exposed to highly transmissible pathogens.

MPH/MS

Traven Wood, MS Environmental Health Sciences (2019), The Ohio State University. Project: Opportunistic Premise Plumbing Pathogens and Effects of Premise Plumbing Disinfection.

Jasmine Lin, MPH Environmental Health (2019), The Ohio State University. Project: Opportunistic Premise Plumbing Pathogens in Healthcare Environments.

Wanyu Huang, MS Environmental Science (2018), The Ohio State University. Project: Modeling the Health Improvement Capabilities of Green Stormwater Infrastructure

Tamka Jones, MS Environmental Engineering (2017), Temple University. Thesis: Efficacy of Biofuel Processing for Wastewater Treatment

Dishani Shah, MS Environmental Health (2017), Temple University. Thesis: Aqueous Chemistry and the Survival or Pathogens in the Natural Environment

Claudia Setubal, MS Environmental Science and Health (2016), Temple University. Thesis: The Role of Subsurface Chemistry on the Persistence and virulence of Pathogenic *Escherichia coli*

Jamie Minich, MS Environmental Health Science (2015), Temple University. Thesis: Development of Runoff and Infiltration Model for Improved Prediction of Surface and Groundwater Impacts of *Mycobacterium avium*

Kirk Breuninger, MPH Environmental Health (2014), Temple University. Thesis: Development of a Water & Foodbourne QMRA Model for Bovine and Human Risk from *Mycobacterium paratuberculosis*

BS.

Geordee Spilkia, BS Environmental Science (2016), Temple University. Topics: personal air quality sensors and assessment of microbiological data

Hillary Cuesta, BS Public Health (2015), Temple University. Topics: cyber learning and water quality and treatment

Steven Kaspin, BS Biology (2016), Temple University. Topics: cyber learning in environmental sciences and health

Kelsey Balfour, BS Environmental Science (2015), Temple University. Topics: laboratory techniques, health modelling and environmental kinetics.

Taiwo Adewunmi, BS Environmental Engineering (2015), Temple University. Topics: laboratory techniques, health modelling and Design.

Brian M. Panzl, BS Microbiology (2011), Michigan State University. Topics: laboratory techniques and computational model and application development.

CONFERENCE PRESENTATIONS

Society for Risk Analysis, Annual Meeting, Dynamic Modeling of LegionnairesâĂŹ Disease Health Risk In Hospital Hot Water Systems. New Orleans, LA, USA, December 2018

Society for Risk Analysis, Annual Meeting, Comparing Opportunistic Premise Plumbing Pathogen Infection Risks Between Conventional and Low-Flow Fixtures. New Orleans, LA, USA, December 2018

Society for Risk Analysis, Annual Meeting, A Quantitative Microbial Risk Assessment Model for Intervention Targeting of the San Diego Homeless Population HepA Outbreak. New Orleans, LA, USA, December 2018

Society for Risk Analysis, Annual Meeting, Impacts of Showering Compliance Rates on the Risk of Infection from Cryptosporidium spp. in Swimming Pools. New Orleans, LA, USA, December 2018

Society for Risk Analysis, Annual Meeting, Effects of Water Chemistry on Infectivity of Legionella Pneumophila. New Orleans, LA, USA, December 2018

Water Quality Technology Conference, Risk-Based Water Quality Target Concentrations for a Complex Group of Pathogens, the Mycobacterium Avium Complex (MAC). Toronto, Canada, November 2018

Water Quality Technology Conference, Quantitative Microbial Risk Assessment of Legionella

pneumophila Infection During a Showering Event. Toronto, Canada, November 2018

Water Quality Technology Conference, The Effects of Disinfectants on the Infectivity of Legionella Pneumophila in Water Distribution Systems. Toronto, Canada, November 2018

Society for Risk Analysis, Annual Meeting, The Assessment of Opportunistic Premise Plumbing Pathogens Demands New Dose Response Knowledge. Washington DC, USA, Dec 2017

Society for Risk Analysis, Annual Meeting, Meta Analysis of *Legionella pneumophila* Growth and Persistence Data. Washington DC, USA, Dec 2017

American Water Works Association, Annual Conference and Exhibition. Development of a Combined Growth and Persistence Model for *L. pneumophila* in Drinking Water for QMRA Models. Philadelphia, PA, USA, June 2017

American Society for Engineering Education. QMRA Wiki: An Educational Tool for Interdisciplinary Teaching of Risk Modeling in Engineering Curricula. Columbus, OH, USA, June 2017. Perm URL: https://peer.asee.org/27787

American Society for Engineering Education. Measuring the success of an educational program through box-and-arrow diagram: A case study of the Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Columbus, OH, USA, June 2017

American Society for Engineering Education. Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III): A Platform for Cross Disciplinary Training of Engineers with Social and Biological Scientists to Address Public Health Issues. Columbus, OH, USA, June 2017

UNC Water Institute, UNC Water Microbiology Conference, Development of a Combined Growth and Persistence Model for *Legionella pneumophila* in Biofilms in Drinking Water for QMRA Models. Chapel Hill, NC, USA, May 2017

UNC Water Institute, UNC Water Microbiology Conference, Development of a 2-Dimensional Simulation Method for the Optimization of Dose Response Models for Uncertain Pathogens. Chapel Hill, NC, USA, May 2017

UNC Water Institute, UNC Water Microbiology Conference, VizDR a Microbial Dose Response Modeling Application for QMRA Novices and Students. Chapel Hill, NC, USA, May 2017

National Council on Science and the Environment, 17^{th} National Conference and Global Forum on Science, Policy and the Environment. Smart Models for Resilient Water Systems. Washington DC, USA, Jan 2017

Borchardt Conference, Development of a Combined Growth and Persistence MOdel for *Legionella pneumophila* in Drinking Water Biofilms for QMRA Modeling. Ann Arbor, MI, USA, Feb 2017

Society for Risk Analysis, Annual Meeting, Development of a Combined Growth and Persistence Model

for *Legionella pneumophila* in Biofilms in Drinking Water for QMRA Models. San Diego, CA, USA, Dec 2016

Society for Risk Analysis, Annual Meeting, Development of an Air Pollutant Dose Response Model for Asthma Incidents Specific to Philadelphia for Triple Bottom Line Modeling. San Diego, CA, USA, Dec 2016

Society for Risk Analysis, Annual Meeting, Development of a Dynamic Triple Bottom Line Model Stage 1: Environmental Benefits Model. Arlington, VA, USA, Dec 2015

Society for Risk Analysis, Annual Meeting, Development of an Age Dependent Dose Response Model for Three Strains of Encephalitis Viruses. Arlington, VA, USA, Dec 2015

Association of Environmental Engineering and Science Professors, Refinement of a Novel 2-D Simulation Based Technique for Dose Response Model Optimization: Norovirus. New Haven, CT, USA, June 2015

Association of Environmental Engineering and Science Professors, Development of Two Independent Methods for the Modeling of Detection Limits in QMRA. New Haven, CT, USA, June 2015

Society for Risk Analysis, Annual Meeting, New Method Development: Advanced 2-D Simulation Technique for Dose Response Model Optimization, Case Studies in Environmental Disinfection. Denver CO, USA, December 2014

Society for Risk Analysis, Annual Meeting, Modeling Health Effect Changes Contingent on Subsurface Chemistry for Groundwater and Sole Source of Drinking Water. Denver CO, USA, December 2014

International Environmental Modeling and Software Society, The QMRA Wiki: A Social Media Tool for Interdisciplinary and Interagency Collaboration for Quantitative Microbial Risk Assessment. San Diego CA, USA, June 2014

Association of Environmental Engineering and Science Professors, Bootstrap Uncertainty Analysis of K-Nearest Neighbor Classification for Microbial Source Tracking. Tampa FL, July 2011

Society for Risk Analysis, Annual Meeting, Stochastic Modeling of Water Reclamation Treatment Systems Addressing Cryptosporidium Risks at a Recreational Spray Park. Charleston SC, December 2011

Society for Risk Analysis, Annual Meeting. Virus and Non-Spore Forming Bacteria QMRA of Fomites Accounting for Surface Sampling Efficiencies. Charleston SC, December 2011

Society for Risk Analysis, Annual Meeting, Use of Quantitative Microbial Risk Assessment and Predictive Modeling to Inform Beach Closures. Charleston SC, December 2011

International Water Association, The Exposure Assessment, a Key to the QMRA Framework. Montreal, Canada, September 2010

DHS Science and Technology Directorate, Science and Technology Advisory Committee, The Center for Advancing Microbial Risk Assessment. Frederick, Maryland, April 2010

DHS Science and Technology Directorate Office of University Programs, Annual University Summit, Development of an Estuary Protection Response Strategy Using QMRA. Washington, DC, March 2010

Society for Risk Analysis, Annual Meeting, Development and Evaluation of Physiologically Based Dose Response Models for Inhalational Anthrax. Baltimore, Maryland, December 2009

Association of Environmental Engineering and Science Professors, 2009 Conference, Physiologically Based Dose Response Models for Inhalational Anthrax. Iowa City, Iowa, July 2009

American Society for Microbiology, 109th General Meeting, Development of Mechanistic, Physiologically Based Dose Response Models for Inhalational Anthrax. Philadelphia, Pennsylvania, June 2009

DHS Science and Technology Directorate Office of University Programs, Annual University Network Summit, Including Pathogenesis and Transport Physics for Inhalational Dose Response of *Bacillus anthracis*. Washington DC, March 2009

DHS Science and Technology Directorate Office of University Programs, Annual University Network Summit, *Tularemia* Dose Response Analysis for Oral Exposure of Multiple Strains. Washington DC March 2009

DHS Science and Technology Directorate Office of University Programs, Annual University Network Summit, A Dose Response Model for Equine Encephalitis Viruses with Age Susceptibility Quantification. Washington DC, March 2009

Society for Risk Analysis, Annual Meeting Benefit-Cost Analysis to Develop Targets for Ambient Air Sampling. Boston, Massachusetts, December 2008

Society for Risk Analysis, Annual Meeting Microbial Dose Response Modeling for the 21st Century: Development of Mechanistic Dose Response Models. Boston, Massachusetts, December 2008

Society for Risk Analysis, Annual Meeting Effect of Host Species on the Dose Response of Inhaled *Bacillus anthracis* Spores. Boston, Massachusetts, December 2008

EPA and DHS, Conference on Real-World Applications and Solutions for Microbial Risk Assessment, Bayesian Hierarchical Modeling to Estimate Interspecies Dose-Response Safety Factors. Bethesda, Maryland, April 2008

EPA and DHS, Conference on Real-World Applications and Solutions for Microbial Risk Assessment, Quantification of Host Age Effects on the Dose Response of *Variola major* (causative agent of smallpox). Bethesda, Maryland, April 2008

DHS Science and Technology Directorate Office of University Programs, Annual University Network

Summit, Quantification of the Effect of Age on the Dose Response of *Variola major* in Suckling Mice. Washington DC, March 2008

Society for Risk Analysis, Annual Meeting, Quantification of the Effect of Age on the Dose Response of Variola major in Suckling Mice. San Antonio, Texas, December 2007

Society for Risk Analysis, Annual Meeting, A Bayesian Statistical Modeling Approach for Bacillus anthracis Dose Response Data. San Antonio, Texas, December 2007

Drexel University, Annual Research Day, Effect of Host Species on the Dose Response of Inhaled *Bacillus anthracis* Spores. Philadelphia, Pennsylvania, April 2007

Drexel University, Engineering Research Symposium, âĂIJEffect of Host Species on the Dose Response of Inhaled *Bacillus anthracis* SporesâĂİ Philadelphia, Pennsylvania, April 2007

DHS Science and Technology Directorate Office of University Programs, Annual University Network Summit, Effect of Host Species on the Dose Response of Inhaled *Bacillus anthracis* Spores. Washington DC, March 2007

Society for Risk Analysis, Annual Meeting, Effect of Host Species on the Dose Response of Inhaled *Bacillus anthracis* Spores. Baltimore, Maryland, December 2006

CONFERENCE/WORKSHOP ORGANIZATION

Meeting Organization

SRE Discovery Theme Water Research Forum; Columbus, OH November 2016

CAMRA All Principle Investigator Meeting; Washington DC, March 2011

CAMRA All Principle Investigator Meeting; EPA National Homeland Security Research Center, Cincinnati Ohio, October 2009

Workshop Organization

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. East Lansing, MI, USA, Aug 2016

UNC Water Institute, UNC Water Microbiology Conference. The International Risk Consortium Inaugural Meeting. May 2017

UNC Water Institute, UNC Water Microbiology Conference. The Evolution of Quantitative Microbial Risk Assessment: How to Fully Realize its Contribution to Water Policy and Human Health Risk Reduction. May 2017

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. East Lansing, MI, USA, Aug 2015

Society for Risk Analysis, Annual Meeting. Health Risk Analysis for the Risk Professional. Denver CO, USA, Dec 2014

6th CAMRA QMRA Summer Institute, Michigan State University, East Lansing, MI Aug 2011.

Association of Environmental Science and Engineering Professors, Education and Research Conference. Teaching Quantitative Microbial Risk Assessment in Environmental Engineering and Science. Tampa FL, USA, July 2011

International Water Association, World Water Congress. Introduction and Use of QMRA for Addressing Safety and Security in the Water Environment: Applications for Drinking Water, Recreational Waters and Biosolids. Montreal, Quebec, Canada, Sept 2010

5th CAMRA QMRA Summer Institute; Delft University of Technology, Delft, Netherlands June 2010

CAMRA Principle Investigator 2010/2011 Future Research Workshop; East Lansing, MI, USA, May 2010

4th CAMRA QMRA Summer Institute; Michigan State University, East Lansing, MI, USA, Aug 2009

Workshop Participation (Instructor)

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Environmental Modeling. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Markov Chain Modeling. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Monte Carlo Modeling. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Public Health Engineering and Mathematics: Quantifying Health Risks. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. R Programming. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Predictive Microbiology. East Lansing, MI, USA, Aug 2015

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Environmental Modeling. East Lansing, MI, USA, Aug 2015

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Markov Chain Modeling. East Lansing, MI, USA, Aug 2015

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Monte Carlo Modeling. East Lansing, MI, USA, Aug 2015

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. R Programming. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Public Health Engineering and Mathematics: Quantifying Health Risks. East Lansing, MI, USA, Aug 2016

Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute. Predictive Microbiology. East Lansing, MI, USA, Aug 2016

Society for Risk Analysis, Annual Meeting. Exposure Modeling in Health Risk Analysis. Denver Colorado, December 2014

6th CAMRA QMRA Summer Institute; Statistics and Uncertainty. Michigan State University, East Lansing, MI August 2011.

6th CAMRA QMRA Summer Institute; Monte Carlo and Crystal Ball. Michigan State University, East Lansing, MI August 2011.

6th CAMRA QMRA Summer Institute; Stochastic Modeling and the Markov Processes. Michigan State University, East Lansing, MI August 2011.

Association of Environmental Science and Engineering Professors, Education and Research Conference. Teaching Quantitative Microbial Risk Assessment in Environmental Engineering and Science. Tampa Florida, July 2011

International Water Association, World Water Congress. Introduction and Use of QMRA for Addressing Safety and Security in the Water Environment: Applications for Drinking Water, Recreational Waters and Biosolids. Montreal, Canada, September 2010

5th CAMRA QMRA Summer Institute. Statistics and Uncertainty. Delft University of Technology, Delft, Netherlands June 2010

5th CAMRA QMRA Summer Institute. Monte Carlo and Crystal Ball. Delft University of Technology, Delft Netherlands June 2010

4th CAMRA QMRA Summer Institute. Monte Carlo and Crystal Ball. Michigan State University, East Lansing, MI, August 2009

3rd CAMRA QMRA Summer Institute. Monte Carlo and Crystal Ball. Michigan State University, East Lansing, MI, August 2008

Invited Lectures & Presentations

Building Water Quality and Health Risks - Using QMRA to Determine Management Strategies. October 2018, Arizona State University, Pheonix, AZ

Smart Systems Models - Understanding how Decisions are Made under Uncertainty. May 2018, University of Arizona, Tucson, AZ

Lake Seneca Spray Park Cryptosporidium Outbreak. May 2017, University of Tokyo, Tokyo, Japan

Smart Systems Models - Capturing System Uncertainties Through Modeling and Simulation. December 2016, College of Engineering, Northeastern University, Boston, MA, USA

Smart Water Systems - The Future of Public Health and Water Engineering February 2015 College of Engineering, Glasgow University, Glasgow, UK

Water Treatment in the Developed and Developing Worlds - Course: Emergency Preparedness Response and Health, Summer 2014, Department of Public Health, Temple University, Philadelphia, PA, USA

What is Environmental Health? - Course: Introduction to Public Health, Autumn 2012, 2013 and 2014, Department of Public Health, Temple University, Philadelphia, PA, USA

Water Reuse Design and OptimizationâĂİ Series of 4 lectures - Course: Water and Wastewater Treatment Design, Spring 2012, Department of Civil Architectural and Environmental Engineering, North Carolina Agriculture and Technology State University, Greensboro, NC, USA

New Concepts in Engineering Decision Analysis: Water Treatment Processes - Course: Water Treatment Design, Autumn 2011, Department of Biosystems and Agricultural Engineering, Michigan State University, East Lansing, MI, USA

Water Treatment and Risk Analysis - Course: Water Quality and Treatment, Autumn 2010, Department of Biosystems and Agricultural Engineering, Michigan State University, East Lansing, MI, USA

QMRA: The Bridge Between Environmental Engineering and Health - Course; Water and Wastewater Treatment, Autumn 2014, Department of Civil and Environmental Engineering, Temple University, Philadelphia, PA, USA

Science Advisory Council Meetings

Council expert and presenter: Department of Homeland Security, Science and Technology Directorate; Homeland Security Science and Technology Advisory Committee; National Biodefense Analysis and Countermeasures Center, Frederick, Maryland, April and June 2010

Expert Panel Participation

Incorporating Risk Modeling Methods Into Regulatory Needs and Future Development. University of Tokyo, Tokyo, Japan, May 2017

Engineers Foundation of Ohio, Regulations for Water Safety: SDWA, US EPA and Flint. Powell, Ohio, USA, Nov 2016

Sierra Club Pennsylvania Chapter . Sierra Club Public Meeting on Zero Emission Buses. Philadelphia, PA, Nov 2015

DHS Science and Technology Directorate Office of University Programs, Annual University Summit. Panel 3 Using QMRA to Improve Human and Environmental Resilience After a Bioterrorism Attack. Washington DC, March 2010

DHS Science and Technology Directorate Office of University Programs, Annual University Summit. Panel 23 Advancing Exposure Science. Washington DC, March 2009

DHS Science and Technology Directorate Office of University Programs, Annual University Summit. Panel 28 Advancing Consequence Modeling and Decision Modeling. Washington DC, March 2009

Session Organization

National Council for Science and the Environment. 17^{th} National Conference and Global Forum on Science, Policy and the Environment. Microbiology of the Built Environment: Implications for Health and Design. Washington DC, USA, January 2017

DHS, Science and Technology Directorate, Office of University Programs; Annual University Network Summit on Research and Education. Panel 3, Using QMRA to Improve Human and Environmental Resilience After a Bioterrorist Attack. Charleston, SC, December 2011

Session Chair

Society for Risk Analysis, Annual Meeting. T3-B Diverse Modeling Approaches for Exposure Assessment. Washington DC, March 2010

Society for Risk Analysis, Annual Meeting. T2-H Epidemiology and Environmental Risk Assessment. Boston, MA, December 2008

Invited Seminar Lecture

Smart Systems Models - Capturing System Uncertainties Through Modeling and Simulation. December 2016, College of Engineering, Northeastern University, Boston, MA, USA

Temple University College of Public Health Teaching Innovation Showcase. Use of Novel Technologies and Wikis for Computational Sciences Instruction. Philadelphia, PA, Oct 2015

Temple University Community Driven Research Day. Investigation of Sustainable Water Resources in the Light of Global Climate Change. Philadelphia, PA, Dec 2014

Philadelphia College of Osteopathic Medicine Research Colloquium. How Our Water Sources and Quality Affect Population Health, Advanced Modeling Methods. Philadelphia, PA, September 2013

IBM Smarter Cities Research Centre, Smart Infrastructure: Water and Energy. How QMRA can enlighten the Concept of Smart Water and Health. Dublin, Ireland, June 2012

Michigan State University Bioeconomy Institute, Two Part Colloquium Series on Water Issues. Dose Response: The Quantitative in Quantitative Microbial Risk Assessment. Holland, MI, April 2011

Media Appearances

Radio

Radio Times, National Public Radio. 17 Dec, 2014 - 40th Anniversary of Safe Drinking Water Act Special Edition. Archive and transcript available: http://tinyurl.com/pnv68ru

Print

Men's Health, Online Sept 2018 - What's in Your Water? Interviewed in how to protect your health from hazards in drinking water and how water is treated to become potable.

Women's Health, Online March 2018, Print April 2018 - Is Tap Water Safe? Here's How to Tell. Interviewed regarding the relative safety of drinking water in the nation and how to protect your health. Online version: https://tinyurl.com/y9sgc8rf

Philadelphia Inquirer, Philadelphia, PA. 19 Jan 2015 - When you Get One Wit', What are you Getting? Interviewed regarding health risks from food and water contamination. Archive available: http://tinyurl.com/lg3kclp

Reading Eagle, Reading, PA. 10 Sept 2014 - Hydraulic Fracturing What Are the Issues? Interviewed regarding water contamination and technology to respond. Archive unavailable.

LEADERSHIP ACTIVITIES

Interim Division Director *Oct 2014 - July 2016*
Division of Environmental Health, Department of Epidemiology and Biostatistics
Temple University

Faculty Search Committee Chair *April 2014 - May 2015*
Division of Environmental Health, Department of Epidemiology and Biostatistics
Temple University

Curriculum Development Committee Chair *Jan 2013 - June 2015*
Division of Environmental Health, Department of Epidemiology and Biostatistics
Temple University

Curriculum Development Committee Chair *Jan 2013 - June 2015*
Department of Public Health
Temple University

Faculty Search Committee Member *April 2014 - May 2015*
Department of Civil and Environmental Engineering
Temple University

Merit Committee Co-Chair *Aug 2013 - June 2015*
Department of Public Health
Temple University

Ph.D. Selection Committee Member *May 2013 - June 2015*
Department of Public Health
Temple University

Co-Founder & President *May 2008 - May 2009*
Homeland Security Philadelphia Student Chapter

President — *Sept 2007 - Sept 2008*
International Association of Hydraulic Engineering and Research
Drexel University Student Chapter

Board Member — *Sept 2006 - Sept 2007*
Student Retention Workshop
Office of the Provost, Drexel University

Secretary — *Sept 2006 - Sept 2007*
International Association of Hydraulics Engineering and Research
Drexel University Student Chapter

President — *Sept 2002 - Sept 2003*
Air and Waste Management Association
Wilkes University Student Chapter

AWARDS

Faculty Service Award — *Oct 2015*
Department of Public Health, Temple University

Koerner Family Fellowship — *Oct 2008*
Koerner Family, Drexel University

Teaching Assistant of the Year Award (Highly Commended) — *May 2009*
Graduate Studies Office, Drexel University

Student Merit Award — *Dec 2009*
Biological Stressors Specialty Group
Society for Risk Analysis

Student Travel Award — *Dec 2007, 2008 & 2009*
Society for Risk Analysis

Graduate Assistantships in Areas of National Need (GAANN) — *Sept 2006 - Aug 200*
United States Department of Education

Dean's Fellowship — *Sept 2004*
Drexel University

Steven Geigrich Memorial Scholarship — *March 2007*
Giegrich Family, Drexel University

Northeastern Chemical Association Scholarship — *Oct 2005*
Northeastern Chemical Association

Alumni Award Scholarship — *Sept 2004*
Drexel University

Extracurricular Activities Award *May 2003*
Geo-Environmental Sciences and Engineering Department
Wilkes University

PROFESSIONAL ACTIVITIES

Professional Society Memberships

Society for Risk Analysis

International Water Association

Association of Environmental Engineering and Science Professors

American Academy of Engineering Education

American Water Works Association

Reviewing

Risk Analysis

Environmental Science and Technology

International Journal of Environmental Health Research

Water Research

Water Science and Technology

Environmental Modeling and Software

VOLUNTEER SERVICE

Community and High School Outreach *Nov 2005 - July 2009*
Department of Civil Architectural and Environmental Engineering
Drexel University

DHS Specialty Award Judge *June 2008*
2008 Intel International Science and Engineering Fair

Student Ambassador *Sept 1999 - Feb 2004*
Department of Admissions, Wilkes University

Volunteer Firefighter *Jan 1997 - Dec 2008*
Weatherly Area Fire Company No. 1