

## JADE MITCHELL

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### EXPERTISE AND RESEARCH INTERESTS

- Human health risk assessment of chemical and microbial stressors from diverse environmental exposures including food, water, indoor microenvironments and bioterrorism
- Quantitative analysis: Classical and Bayesian statistics; decision science and analysis; systems analysis
- Modeling: microbial dose-response, persistence and exposure modeling including both exogenous and endogenous fate
- Risk management and environmental policy: benefit-cost analysis, risk perception and communication

### EDUCATION

**2010, Ph.D.**                    **Environmental Engineering**, Drexel University, Philadelphia, PA.  
**2007, M.S.**                    **Civil Engineering**, Drexel University, Philadelphia, PA.  
**1997, B.S.**                    **Civil and Environmental Engineering**, University of Pittsburgh, Pittsburgh, PA.

### PROFESSIONAL EXPERIENCE

7/2018 – present            **Associate Professor**, Biosystems and Agricultural Engineering (BAE), Michigan State University (MSU), East Lansing, MI.  
**Program Director**, Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III), Michigan State University (MSU), East Lansing, MI. (8/2015 – Present)

8/2012 – 6/2018            **Assistant Professor**, Biosystems and Agricultural Engineering (BAE), Michigan State University (MSU), East Lansing, MI.

3/2012-8/2012            **Risk Analyst**, U.S. Department of Agriculture (USDA), Food Safety Inspection Service, Risk Assessment Division, Washington, DC.

9/2010-3/2012            **Post-Doctoral Fellow**, U.S. Environmental Protection Agency (U.S. EPA), National Exposure Research Laboratory, Research Triangle Park, NC.

7/2008-6/2010            **NSF GK-12 Fellow**, Drexel University and James Rhoads Middle School, Philadelphia, PA.

9/2006-9/2010            **Graduate Research Assistant (PhD)**, Drexel University, Philadelphia, PA.

6/2008-10/2008            **Graduate Research Assistant, Oak Ridge Institute for Science and Education**, U.S. Army Public Health Command, Aberdeen, MD.

3/2005-7/2008            **Teaching Assistant**, Drexel University, Philadelphia, PA.

6/2006-9/2006            **Graduate Research Intern**, Pacific Northwest National Laboratory, Applied Geology and Geochemistry, Richland, WA.

6/2005-3/2007            **Graduate Research Assistant (MS)**, Drexel University, Philadelphia, PA.

3/2002-2/2005            **Engineer**, McMahon Associates, Fort Washington, PA.

11/2000-3/2002            **Highway Designer**, McCormick Taylor & Associates, Philadelphia, PA.

4/2000-10/2000            **Assistant Project Manager**, Bovis Lend Lease, Bethesda, MD.

1/1998-4/2000            **Project Engineer**, Tompkins Builders/J.A. Jones Co., Washington, DC.

8/1995-5/1997            **Project Intern**, Corps of Engineers, Pittsburgh, PA.

### AWARDS AND HONORS (postgraduate only)

2018            **2018 Engineering Alumni Lecturer**, Wesley O. Pipes Endowed Lectureship, Drexel University, Philadelphia, PA

2017            **Excellence in Teaching Award**, Michigan State University, College of Agriculture and Natural Resources. *Recognizes individuals who have demonstrated a commitment to quality scholarship of teaching as evidenced by their contributions to teaching and learning and demonstrated success.*

2014            **Scientific and Technological Achievement Awards (STAA) Award**, U.S. EPA Level II, “ExpoCast High Throughput Framework for Rapid Prioritization of Human Exposure to Environmental Chemicals”.

2011            **Pathfinder Innovation Project**, U.S. EPA, “The Systems Reality Modeling Project Part 1: Chemical Inventory”.

2011            **“S” Award – Special Accomplishment Recognition Award**, U.S. EPA. *Recognizes excellence and leadership in developing innovative research in the area of exposure screening and prioritization of*

chemicals.

**GRANT FUNDING (selected from total postgraduate)**

\$4.06 million total on 14 grants; \$2.57 million to home institutions

**Active Grants to Michigan State University**

#	Dates	Agency	Total	Inst. Total
1.	2017-2021	Purdue University; U.S. EPA (Prime)	\$1.98M	\$912,088
	Title:	<i>National Priorities Research Grant: Right Sizing Tomorrow's Water Systems for Efficiency, Sustainability, and Public Health</i>		
2.	2017-2019	National Center for Socio-Environmental Synthesis (SESYNC)	<i>No dollar amount specified - Four, three-day multidisciplinary research meetings at SESYNC, Annapolis, MD</i>	
	Title:	<i>Risk Perception in the Provision of Aquatic Ecosystem Services</i>		
3.	2014-2020	NIH	\$791,506	\$791,506
	Title:	<i>Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III)</i>		
4.	2017-2018	MSU Center for Research on Ingredient Safety	\$75,000	Internal (MSU)
	Title:	<i>Assessment of Exposure and Risk Associated with Cholesterol Oxidation Products in Food Using Dietary Intake Modeling</i>		
5.	2016-2017	Procter & Gamble	\$51,599	\$51,599
	Title:	<i>QMRA to Assess the Effect of Antimicrobial Residual Efficacy on Risk of Infection</i>		
6.	2015-2017	MSU Center for Water Science	\$60,000	Internal (MSU)
	Title:	<i>Citizen Science Study of Contaminant Exposures Related to Water Affordability in Detroit</i>		
7.	2015-2017	MSU Center for Health Impacts of Agriculture	\$250,000	Internal (MSU)
	Title:	<i>Antibiotic Resistance Genes in the Environment: Organizing and Expanding MSU Capabilities for Risk Reduction</i>		
8.	2014-2017	MSU Midland Research Institute for Value Chain Creation (a.k.a. AXIA Institute)	\$325,000	Both Internal MSU and Dow Chemical
	Title:	<i>Building a Knowledge Value Chain to Support Global Water Safety - Global Water Pathogen Project in collaboration with UNESCO; <a href="http://www.waterpathogens.org">http://www.waterpathogens.org</a></i>		
9.	2016-2017	MSU ESPP Flint Funds	\$26,000	Internal (MSU)
	Title:	<i>Infrastructure, Trust, and the Shadow of Flint</i>		
10.	2015-2016	Procter & Gamble	\$29,952	\$29,952
	Title:	<i>Quantitative Microbial Risk Assessment (QMRA) for Various P&amp;G Antimicrobial Products on Porous and Nonporous Surfaces</i>		
11.	2013	NSF PASI	\$99,986	\$99,986
	Title:	<i>Quantitative Microbial Risk Assessment Innovation Institute (QMRA II)</i>		
12.	2012-2013	U.S. EPA and U.S. Dept. of Homeland Security (Prime)	\$10M	\$10M, \$189,449 to Co-PI through MSU CAMRA
	Title:	<i>Center for Advancing Microbial Risk Assessment (CAMRA) *Allocated post initial award/agency approved as Co-PI officially after joining MSU in 2012</i>		

**PUBLICATIONS (TOTAL PUBLISHED = 43; PEER-REVIEWED = 39)**

(<sup>1</sup> Graduate Student or Post-Doctoral mentored, <sup>2</sup> Student advised through independent study or course, \*Corresponding author)

**PEER-REVIEWED JOURNAL ARTICLES (27 published; 5 in review) – last 5 years only**

1. Salehi, M., Odimeyomi, T., Ra, K., Ley, C., Julien, R.<sup>1</sup>, Nejadhashemi, A.P., Hernandez-Suarez, J.S., **Mitchell, J.**, Shah, A.D. and Whelton, A.<sup>3\*</sup>. An investigation of spatial and temporal drinking water quality variation in green residential plumbing. *Building and Environment*, (2020) 169, p.106566.
2. K. Dean<sup>1</sup> and **J. Mitchell\***. Reverse QMRA for *Pseudomonas aeruginosa* in Premise Plumbing to Inform Risk Management. *Journal of Environmental Engineering*, (2019)146(3), 04019120. (Impact Factor: 1.657)
3. K. Dean<sup>1</sup>, Mark H. Weir and **J. Mitchell\***. "Development of a Dose-Response Model for *Naegleria fowleri*," *Journal of Water and Health* (2019) 17(1):63-71. doi: 10.2166/wh.2018.181. (Impact Factor: 1.683)
4. K. Dean<sup>1</sup>, A. Wissler<sup>1</sup>, J.S. Hernandez-Suarez, P. Nejadhashemi, and **J. Mitchell\***. "Modeling the Persistence of Viruses in Untreated Groundwater" *Science of the Total Environment* (2019) Nov 22:134599. doi: 10.1016/j.scitotenv.2019.134599. [Epub ahead of print] (Impact Factor: 5.589; Elsevier Scopus CiteScore: 5.92)
5. M. Weir\*, A. L. Mraz and **J. Mitchell**. "An Advanced Risk Modeling Method to Estimate Legionellosis Risks Within a Diverse Population" *Water* 12 (1) doi: [10.3390/w12010043](https://doi.org/10.3390/w12010043) (Impact Factor: 2.721)
6. Adhikari, U.<sup>1</sup>, Chabrelie, A.<sup>1</sup>, Weir, M., Boehnke, K., McKenzie, E., Ikner, L., Wang, M., Wang, Q., Young, K., Haas, C.N., Rose, J., and **J. Mitchell\***. 2019. A Case Study Evaluating the Risk of Infection from Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV) in a Hospital Setting Through Bioaerosols. *Risk Analysis*, 39(12), pp.2608-2624. (Impact factor: 2.564)
7. Esfahanian, E.<sup>1</sup>; Adhikari, U.<sup>1</sup>; Dolan, K.; and **Mitchell, J.\*** Construction of A New Dose-Response Model for *Staphylococcus aureus* Considering Growth and Decay Kinetics on Skin. *Pathogens* 2019,8, 253. <https://doi.org/10.3390/pathogens8040253> (Impact Factor: 3.405)
8. A. Bope, M. Weir, A. Pruden, M. Morowitz, **J. Mitchell** and K. Dannemiller. "Translating Research to Policy at the NCSE 2017 Symposium "Microbiology of the Built Environment: Implications for Health and Design," *Microbiome* (2018) 6:160 Accessible at: <https://doi.org/10.1186/s40168-018-0552-y> (IMPACT FACTOR: 10.903)
9. **J. Mitchell,\*** L. Sifuentes, A. Wissler<sup>1</sup>, S. Abd-Elmaksoud, G. Lopez and C. Gerba. "Modelling of ultraviolet light inactivation kinetics of methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, *Clostridium difficile* spores and murine norovirus on fomite surfaces," *Journal of Applied Microbiology* (2019) 126 (1) First published Sept. 2018 at: (<https://doi.org/10.1111/jam.14103>) (IMPACT FACTOR: 2.16)
10. K.A. Hamilton, A. Chen<sup>2</sup>, E. de-Graft Johnson<sup>2</sup>, A. Gitter<sup>2</sup>, S. Kozak<sup>2</sup>, C. Niquice<sup>2</sup>, A. Zimmer-Faust<sup>2</sup>, M. H. Weir, **J. Mitchell**, and P. Gurian. "Salmonella risks due to consumption of aquaculture-produced shrimp." *Microbial Risk Analysis*, (2018) 9:22-32 (<https://doi.org/10.1016/j.mran.2018.04.001>)
11. K. S. Enger<sup>1</sup>, **J. Mitchell,\*** B. Murali<sup>1</sup>, D. N. Birdsell, P. Keim, P. L. Gurian and D. M. Wagner. "Evaluating the Long-Term Persistence of *Bacillus* spores on Common Surfaces," *Microbial Biotechnology* (2018) 11(6): 1048-1059 (<https://doi.org/10.1111/1751-7915.13267>) (IMPACT FACTOR: 3.913)
12. M. Salehi, M. Abouali<sup>1</sup>, M. Wang, Z. Zhou, A.P. Nejadhashemi, **J. Mitchell**, S. Caskey and A. Whelton. "Case study: Fixture water use and drinking water quality in a new residential green building," *Chemosphere* (2018) 195:80-89 (<https://doi.org/10.1016/j.chemosphere.2017.11.070>) (IMPACT FACTOR: 4.427)
13. A. Chabrelie<sup>1</sup>, **J. Mitchell,\*** J. Rose, D. Charbonneau, and Y. Ishida. "Evaluation of the Influenza Risk Reduction from Antimicrobial Spray Application on Porous Surfaces," *Risk Analysis* (2018) 3897):1502-1517 (DOI: 10.1111/risa.12952) (IMPACT FACTOR: 2.898)
14. P. Hatami Bahman Beiglou<sup>1</sup>, C. Gibbs, L. Rivers, and U. Adhikari<sup>1</sup> and **J. Mitchell.\*** "Applicability of Benford's Law to Compliance Assessment of Self-Reported Wastewater Treatment Plant Discharge Data," *Journal of Environmental Assessment Policy and Management* (2017) 19(4) 1750017. Accessible at <https://doi.org/10.1142/S146433321750017X>
15. M. Weir, **J. Mitchell**, W. Flynn and J. M. Pope. "VizDR a Microbial Dose Response Visualization and Modeling Application for QMRA Modelers and Educators," *Environmental Modelling & Software*. (2017) 88: 74-83. <http://dx.doi.org/10.1016/j.envsoft.2016.11.011>
16. S. Tamrakar, J. Henley, P. Gurian, C. Gerba, K. Enger<sup>1</sup>, **J. Mitchell** and J. Rose. "Persistence analysis of poliovirus on three different types of fomites," *Journal of Applied Microbiology* (2017)122(2): 522–530. doi: 10.1111/jam.13299
17. L. Rivers; T. Dempsey, **J. Mitchell** and C. Gibbs. "Environmental Regulation and Enforcement: Structures, Processes and the Use of Data for Fraud Detection," *Journal of Environmental Assessment Policy and*

*Management* Vol. 17, No. 3 (2015) doi: 10.1142/S1464333215500337

18. Y. Brooks, A. Aslan, S. Tamrakar<sup>1</sup>, B. Murali<sup>1</sup>, **J. Mitchell**; and J. Rose. “Analysis of the persistence of enteric markers in sewage polluted water on a solid matrix and in liquid suspension,” *Water Research* (2015) 76:201-202

***Under Review or Revision (5 total – not shown)***

***PEER-REVIEWED FULL CONFERENCE PAPERS/ PUBLICATIONS AS PROCEEDINGS (9 total) – last 5 years only***

1. J. Carrera, **J. Mitchell** and L. Radonic. “Community Based Participatory Research and Citizen Science for Community Organizing around Water Quality and Water Shutoffs,” *2017 American Sociological Association Annual Meeting/Water & Inequality Panel/Environment & Technology*, Montreal, QC Canada (August 12-15, 2017)
2. **J. Mitchell**, M. Weir, J. Rose and J. Libarkin. “The Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRAIII) – A Platform for Cross Disciplinary Training of Engineers with Social and Biological Scientists to Address Public Health Issues,” *Proceedings of the 2017 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Columbus, OH (June 25-28, 2017), Accessible at: <https://peer.asee.org/28995>
3. M. Weir, J. Mitchell, A. Mraz, and J. Rose. “QMRA Wiki: An educational tool for interdisciplinary teaching of risk modeling in engineering curriculums,” *Proceedings of the 2017 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Columbus, OH (June 25-28, 2017), Accessible at: <https://peer.asee.org/27787>
4. U. Adhikari<sup>1</sup>, **J. Mitchell**, M. Weir, and J. Libarkin. “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 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Columbus, OH (June 25-28, 2017), Accessible at: <https://peer.asee.org/28659>
5. E. Esfahanian<sup>1</sup>, K. Dolan, **J. Mitchell**. “Construction of a microbial kinetic model to capture *Staphylococcus* growth and decay on skin,” *9<sup>th</sup> International Conference on Inverse Problems in Engineering*, Waterloo, Ontario, Canada. (May 23-26, 2017)

***PEER-REVIEWED BOOK CHAPTERS (2)***

1. **J. Mitchell** and S. Akram. 2017. “Pathogen Specific Persistence Modeling Data.” In: J.B. Rose and B. Jiménez-Cisneros, (eds) *Global Water Pathogens Project*, <http://www.waterpathogens.org> (M. Yates (eds) Part 4 *Management of Risk from Excreta and Wastewater*) Accessible at: <http://www.waterpathogens.org/book/pathogen-specific-persistence-modeling-data>. Michigan State University, E. Lansing, MI, UNESCO.
2. D. T. Chang, M. Goldsmith, C. M. Grulke, P. P. Egeghy, Y. Tan, **J. Mitchell-Blackwood**. 2014. "Data mining and informatics-based approaches for new and emerging environmental contaminants" In: *Yearbook of Science and Technology*, McGraw-Hill Professional, New York, NY. ISBN: 978-07-183106-2

***PRESENTATIONS (106)***

***International and Invited Lectures (3)***

*Several lectures over the duration of invited participation in short courses focused on various aspects of human health risk assessment including quantitative analysis of data, modeling, uncertainty analysis, risk perception, risk communication and risk management*

1. Quantitative Microbial Risk Assessment Training and Research Workshop, *Griffith University, Smart Water Research Centre*, Southport QLD, Australia, March 2016
2. International Perspectives on Quantitative Microbial Risk Assessment, *Indian Institute of Public Health*, Hyderabad, India, March 2015
3. QMRA Innovation Institute, *University of Sao Paulo*, Sao Paulo, Brazil, July 2013

***National and Regional Invited Lectures (6)***

4. “Risking Resistance,” 2018 Engineering Alumni Lecturer, Wesley O. Pipes Endowed Lectureship, Drexel University, Philadelphia, PA, October 29, 2018
5. “Risk Assessment: A Marriage Between Engineering and Public Health,” Saginaw Valley State University, Saginaw, MI, College of Science, Engineering & Technology Colloquium Series, February 13, 2018

6. “Antimicrobial Resistance and Risk,” Microbiology of the Built Environment: Implications for Health and Design. *NCSE 2017: Integrating Environment and Health*, 17th National Conference and Global Forum for Science, Policy, and the Environment, Washington, DC, January 24-26, 2017
7. “Potency of Opportunistic Pathogens in Water Systems,” *Society for Risk Analysis (SRA) Dose-Response Specialty Group Webinar*, (presented via internet), July 5, 2016
8. “Legionella –Legacy Threat and New Risk for Safe Drinking Water,” *Michigan Section of the American Water Works Association (AWWA)*, 2016 Fall Regional Meeting, Mt. Pleasant, MI, October 18, 2016
9. “Approaches for Rapid Exposure-Based Prioritization of Environmental Chemicals,” *Society for Risk Analysis Exposure Assessment Specialty Group Webinar* (presented via internet), June 2011

**Local Invited Talks and Lectures (6)**

10. “Water Wars: Our H2O Futures,” *Michigan State University, Honors College, Sharper Focus, Wider Lenses*, East Lansing, MI, September 25, 2017 (Podcasts and YouTube video links of Live Stream Accessible at: <https://honorscollege.msu.edu/programs/sharper-focus-wider-lens.html>)
11. “Measuring the Potential Impacts of the Unintentional Consequences,” *Michigan State University, Center for Ingredient Safety Annual Meeting*, East Lansing, MI, October 4-6, 2016
12. “Application of Quantitative Microbial Risk Assessment (QMRA) to Emerging Areas in Agriculture,” *Michigan State University, Department of Plant, Soils and Microbial Sciences, Seminar Series*, East Lansing, MI, February 18, 2016
13. “Cross-Institute Capacity Building for Water Management,” Panel Speaker, *2015 Fall MSU Extension Conference*, Active and Engaged Learning, and Shiawassee Water Tour, October 13, 2015
14. “Pharmaceuticals and Personal Care Products in the Environment - do we care?” 63rd Michigan Onsite Wastewater Conference, East Lansing, MI, January 7-9, 2014
15. Lectures in data analysis in MS Excel, risk communication, risk perception, and risk management for the *Center for Advancing Microbial Risk Assessment Summer Institute*, East Lansing, MI, August 2011

**Conference Talks (58 total) – last 3 years only**

16. R. Julien<sup>1</sup> and J. Mitchell. “Identifying public health risk factors associated with water use and water quality in a green home” Society for Risk Analysis 2019 Annual Meeting, Arlington , VA, December 8-12, 2019
17. A. Chabreli<sup>1</sup> and J. Mitchell. “Approaches to Address Spread and Risk Characterization for Antibiotic Resistance”. Society for Risk Analysis 2019 Annual Meeting, Arlington , VA, December 8-12, 2019
18. R. Julien<sup>1</sup> and J. Mitchell. “Exploring relationships between water quality and opportunistic pathogen concentrations in a full-scale green home.” Watersmart Innovations Conference & Exposition, Las Vegas, NV, October 2019
19. Dean, K.J.,<sup>1</sup> Hamilton, K., Rasheduzzaman, M. Tolofari, D., Yang, Z., Bartrand, T., Gurian, P.L.<sup>2</sup>, Haas, C.N., Mitchell, J., and Singh, R. “Quantitative Microbial Risk Assessment for Opportunistic Premise Plumbing Pathogens: Challenges and Results from Three Case Studies.” American Water Works Association Annual Conference and Exposition, Denver, CO. June 9-12, 2019.
20. A. Chabreli<sup>1</sup>, L. Zhang, G. Bornhorst and J. Mitchell “Effect of Fluid Dynamics & Rheology on Horizontal Gene Transfer of Antibiotic Resistance Through Conjugation in *E. coli*. :Implications for the Antimicrobial Resistance Spread” 5<sup>th</sup> Symposium on the Environmental Dimension of Antibiotic Resistance (EDAR), June 9-14, 2019, University of Hong Kong, Hong Kong
21. J. Lee, M. Salehi, A. Whelton, J. Mitchell and A. P. Nejadhashemi. “Development of Premise Plumbing Integrated Hydraulic and Water Quality Modeling”. ASCE EWRI 2019 World Environmental & Water Resources Congress, Pittsburgh, PA. May 23, 2019
22. Dean, K.J.<sup>1</sup> and Mitchell, J. “Quantifying the Risk of *P. aeruginosa* in Premise Plumbing for Building Design and Maintenance.” 2019 Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference, Tempe, AR. May 14-16, 2019.
23. R. Julien<sup>1</sup> and J. Mitchell. “Comparing water age with measured water quality within a full-scale green home.” 2019 Association of Environmental Engineering and Science Professors AEESP Research and Education Conference, Tempe, AZ. May 14-16, 2019.
24. R. Julien and **J. Mitchell**. “Estimating Water Age and its Effects on Water Quality in a Full-Scale Green Home,” Society for Risk Analysis 2018 Annual Meeting, New Orleans, LA (December 2-6, 2018)
25. K.J. Dean and **J. Mitchell**. “Reverse QMRA for *Pseudomonas aeruginosa* in a showering event to inform monitoring levels,” Society for Risk Analysis 2018 Annual Meeting, New Orleans, LA (December 2-6, 2018)
26. S.W.L. Teng, I. Lam, T. W. Ng, C. Feng, M. Q. X. Tay, S. Y. Chang, **J. Mitchell**, A. Chen, R. Colwell, and A. Huq. "Molecular Characterization of *Vibrio cholerae* Isolated from Natural Waters in Tropical Regions," (2018)

- Proceedings of the American Water Works Association (AWWA, Water Quality Technology Conference, Toronto, Ontario, Canada (November 11-15, 2018)
27. A.L. Mraz, K. A. Hamilton, **J. Mitchell**, P. L. Gurian, M. H. Weir. “Quantitative Microbial Risk Assessment of *Legionella pneumophila* Infection During a Showering Event “Proceedings of the American Water Works Association (AWWA, Water Quality Technology Conference, Toronto, Ontario, Canada (November 11-15, 2018)
  28. **J. Mitchell**, and A. Whelton. “Predicting Drinking Water Safety Inside Buildings in a Technology Changing World,” National Environmental Health Association, NEHA 2018 Annual Educational Conference (AEC) & Exhibition and HUD Healthy Homes Conference, Anaheim, CA (June 25 - 28, 2018)
  29. K.J. Dean and **J. Mitchell**. “Parameter Estimation to Model Virus Persistence,” Inverse Problems Symposium, Michigan State University, East Lansing, MI. (June 3-5, 2018)
  30. R. Julien, K. Dean, and **J. Mitchell**. “An evaluation of the impact of green building design elements on microbial water quality”. Water Microbiology Conference, The University of North Carolina (UNC) Water Institute, Chapel Hill, NC. (May 22-24, 2018)
  31. K.J. Dean, R. Julien and **J. Mitchell**. “Assessment of Risks Associated with *Pseudomonas aeruginosa* in Low Flow Fixtures in a Residential Green Building,” Water Microbiology Conference, The University of North Carolina (UNC) Water Institute, Chapel Hill, NC. (May 22-24, 2018)
  32. **J. Mitchell**, I. Kropp, A. P. Nejadhashimi, R. Julien, G. Singh, T. Aw, J. Rose, M. Salehi, A. Whelton. “Evaluating the Relationship Between Water Usage and Microbial Drinking Water Quality in a Residential Green Building,” Water Microbiology Conference, The University of North Carolina (UNC) Water Institute, Chapel Hill, NC. (May 22-24, 2018)
  33. M. Weir, A. Mraz and **J. Mitchell**. “An Advanced Legionellosis Risk Model Incorporating Epidemiological Evidence of Disease Burden,” *Society for Risk Analysis 2017 Annual Meeting*, Arlington, VA (December 10-13, 2017)
  34. **J. Mitchell**, K. Dean, S. Tamrakar, Y. Huang and J. Rose. “Opportunistic pathogen dose-response models,” *Society for Risk Analysis 2017 Annual Meeting*, Arlington, VA (December 10-13, 2017)
  35. A. Whelton, M. Salehi, M. Abouali, M. Wang, Z. Zhou, A.P. Nejadhashemi, **J. Mitchell** and S. Caskey. “Water Chemistry and Microbiology Changes as Plumbing Ages,” *Society for Risk Analysis 2017 Annual Meeting*, Arlington, VA (December 10-13, 2017)
  36. B. Feighner and **J. Mitchell**. “Discussion of Lessons Learned from Flint about Risk Assumptions in the Lead and Copper Rule,” *Society for Risk Analysis 2017 Annual Meeting*, Arlington, VA (December 10-13, 2017)
  37. J. Carrera, **J. Mitchell**, and L. Radonic. “Community Based Participatory Research and Citizen Science for Community Organizing around Water Quality and Water Shutoffs,” *2017 American Sociological Association Annual Meeting/Water & Inequality Panel/Environment & Technology*, Montreal, QC Canada (August 12-15, 2017)
  38. **J. Mitchell**, M. Weir, J. Rose, and J. Libarkin. “The Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRAIII) – A Platform for Cross Disciplinary Training of Engineers with Social and Biological Scientists to Address Public Health Issues,” *2017 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Columbus, OH (June 25-28, 2017)
  39. M. Weir, **J. Mitchell**, A. Mraz, and J. Rose. “QMRA Wiki: An educational tool for interdisciplinary teaching of risk modeling in engineering curriculums,” *2017 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Columbus, OH (June 25-28, 2017)
  40. U. Adhikari, **J. Mitchell**, M. Weir, and J. Libarkin. “Measuring the success of an educational program through box-and-arrow diagram: A case study of the Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute,” *2017 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Columbus, OH (June 25-28, 2017)
  41. S. Akram, X. Guo, R. Stedfel, M. Johnson, A. Chabrelie and **J. Mitchell**. “Linking antibiotic usage to proliferation of antimicrobial resistance in the environment: A cases study of a MI dairy farm,” *Association of Environmental Engineers and Science Professors (AEESP) Education and Research Conference*, Ann Arbor, MI (June 20-22, 2017)
  42. S. Akram, Y. Kim, and **J. Mitchell**. “A meta-analysis for estimating the persistence of HF183 marker in environmental waters,” *2017 International Water Association (IWA) Health Related Water Microbiology Conference*, Chapel Hill, NC (May 15-19, 2017)
  43. E. Esfahanian, K. Dolan, and **J. Mitchell**. “Construction of a microbial kinetic model to capture *Staphylococcus* growth and decay on skin,” *9<sup>th</sup> International Conference on Inverse Problems in Engineering*, Waterloo, Ontario, Canada (May 23-26, 2017)
  44. **J. Mitchell**, J. Rose, and D. Donahue. “Expert Evaluation of the Water Crisis in Flint, Michigan,” *Society for*

- Risk Analysis 2016 Annual Meeting*, San Diego, CA (Dec. 11-15, 2016)
45. **J. Mitchell** and V. Misra. "Selection of Surrogates for Biological Agents with Long-Term Environmental Persistence." *Society for Risk Analysis 2015 Annual Meeting*, Arlington, VA (Dec. 6 – 10, 2015)
46. M. Weir and **J. Mitchell**.\* "Viz-DR: A Microbial Dose Response Visualization and Optimization Tool for QMRA Students and Novices," *Society for Risk Analysis 2015 Annual Meeting*, Arlington, VA (Dec. 6 – 10, 2015) \*Presenter
47. **J. Mitchell**. "Understanding the Challenge of Antibiotic Resistant Risks," *Society for Risk Analysis World Congress on Risk 2015*, Singapore (July 19-23, 2015)
48. C. Gibbs, L. Rivers; T. Dempsey, and **J. Mitchell**. "The Use of Data in Environmental Enforcement: A Case Study," *2015 71st Annual Meeting of the American Society of Criminology*, Washington, DC (Nov. 18 – 21, 2015)

*Conference Posters (33 total – not shown - many with students)*

## TEACHING EXPERIENCE

### CREDIT INSTRUCTION

#### *Biosystems Engineering, Michigan State University*

Semester/Year	Course	Course Title	Credits	Description
Spring 2013 Spring 2014 Spring 2015	BE 385	Engineering Design and Optimization	3	Undergraduate – Core junior level introduction to design, project management, engineering economics, linear programming
Fall 2013	BE 891	Advanced Topic in Biosystems Engineering: Human and Environmental Risk Analysis	3	Graduate – risk assessment and modeling course for chemical and biological hazards in multimedia environments; risk management – cost-benefit and decision analysis. (Developed as a new course)
Fall 2013	ESP 803	Human and Ecological Health Assessment and Management	3	Graduate – risk assessment and modeling course for chemical and biological hazards; Team taught- 50%
Fall 2014	BE 491	Special Topic in Biosystems Engineering: Engineering Innovation and Design for Global Health Risk	3	Undergraduate – senior level introduction to microbial risk analysis for the design of systems to mitigate infectious disease risk; Team taught - 33% (Developed as a new course)
Summer 2015 Summer 2016 Summer 2018	BE 891	Advanced Topic in Biosystems Engineering: Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III)	3	Short course lectures and labs on statistical modeling in microbial risk assessment. Developed curriculum, instructional materials and assessments. Work with multidisciplinary teams to conduct research case studies. (Developed as a new course)
Fall 2015	BE 491	Special Topic in Biosystems Engineering: Engineering Innovation and Design for Global Health Risk	3	Undergraduate – senior level introduction to microbial risk analysis for the design of systems to mitigate infectious disease risk; Team taught - 66% (Developed as a new course)
Spring 2016.	BE 890	Independent Study	3	Graduate – Risk assessment modeling to characterize global health risk associated with water contaminated with viruses from raw sewage
Fall 2016; Fall 2017; Fall 2018; Fall 2019	BE 449	Human Health Risk Analysis for Engineering Controls	3	Undergraduate – Senior Design Elective, Biomedical Engineering Concentration requirement, quantitative microbial risk assessment (QMRA), risk management and development of design criteria and controls. (Developed as a new course).

Fall 2018	BE 849	Quantitative Human Health Risk Modeling and Analysis for Microbial Stressors	3	Graduate, Characterization of human health risk from exposures to environmental stressors. Development of empirical and statistical models for health effects and exposure analysis. Probabilistic risk characterization, uncertainty and sensitivity analysis. Problem-based critical evaluation of risk-based environmental decisions. (Developed as new course)
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***Civil, Architectural, and Environmental Engineering, Drexel University***

- Teaching assistant for undergraduate courses: Introduction to Environmental Measurements, Engineering Economics, Groundwater Hydrology, Introduction to Environmental Engineering, Introduction to Infrastructure

***NON-CREDIT INSTRUCTION***

***Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III)***

Oversee the coordination and administration of all aspects of the QMRA III short course for interdisciplinary scholars from multiple disciplinary backgrounds. Develop curriculum, instructional materials and assessments; and lecture. Work with multidisciplinary teams to conduct research case studies. Approx. 30 students per year

- July 2015 at Michigan State University, East Lansing, MI
- August 2016 at Michigan State University, East Lansing, MI
- August 2017 at University of Washington, Seattle, WA
- July 2018 at The Ohio State University, Columbus, OH
- August 2019 at The Ohio State University, Columbus, OH

***ADVISING***

***Primary Advisor (5)***

1. Ryan Julien (PhD Biosystems Engineering). Topic: Impact of Water Usage and Temperature on Factors Affecting Opportunistic Pathogen Risk in Piped Water Systems, expected graduation Fall 2020
2. Kara Dean (MS Biosystems Engineering). Topic: TBD - Understanding uncertainty in predictions of pathogen persistence and its implication in microbial risk assessment, expected graduation Summer 2022
3. Kara Dean (PhD Biosystems Engineering). “Modeling Risk for Intranasal, Inhalation, and Corneal Exposures to Opportunistic Pathogens of Concern in Drinking Water”, graduated Spring 2019
4. Alexandre Chabrelie (M.S. Biosystems Engineering). “An Analysis of the Risk and Risk Reduction of Influenza Virus through Use of Antimicrobial Products” graduated Summer 2019
5. Pouyan Hatami (MS Biosystems Engineering). “Applicability of data driven methods for assessing compliance of wastewater treatment plants self-reported datasets ,” graduated December 2016
6. Elaheh Esfahanian (PhD Biosystems Engineering). “Development of a meteorological, agricultural, stream health, and hydrological (MASH) comprehensive drought index,” graduated May 2016
7. Bharathi Murali (MS Biosystems Engineering). “Comparison of the recovery of *Bacillus anthracis* and *Bacillus thuringiensis* spores from porous media: Considering time and moisture content,” graduated December 2014

***Other Research Advisor (1)***

1. Kaitlyn Casulli (graduate student in Biosystems Engineering). Topic: Dietary exposure modeling for cholesterol oxidation products, bridge project 2017-2018

***Thesis / Dissertation Committees (6)***

1. Vinni Thekkudan Novi, “Antimicrobial and Biodegradable Food Packaging Films with Chitosan-Based N-Halamine Structures to Prevent Contamination by Drug Susceptible and Resistant Strains of *Salmonella* Typhimurium”, M.S. (BE), graduated Summer 2019
2. Leann Matta (PhD Biosystems Engineering). “Biosensing total bacterial load in liquid matrices to improve food supply chain safety using carbohydrate-functionalized magnetic nanoparticles for cell capture and gold nanoparticles for signaling,” graduated December 2018
3. Khang Huynh (PhD Biosystems Engineering). “Plant Uptake and Metabolism of Antimicrobials and Antibiotics”, graduated Spring 2019
4. Chelsea Weiskerger (PhD Civil and Environmental Engineering). Topic: Assessing Hydrogeological Factors



- and Risk Associated with *E. coli* contamination of Chicago beaches
- Sebastian Kevin Stankiewicz (MS Packaging) “Modeling Fluid Milk Waste using Discrete Event Simulation and the Role of Packaging Within the Home”, graduated Spring 2019
  - Francisco Garcésvega (PhD Biosystems Engineering). “Quantifying Water Effects on Thermal Inactivation of Salmonella in Low-Moisture Foods ,” graduated May 2017
  - Valerie Novaes (MS Biosystems Engineering). “Assessing the impacts of post-construction best management practices on stormwater runoff in an ultra-urban environment ,” graduated May 2015

#### **Post-Doctoral Mentees**

Dr. Sina Akram (2016 – 2017), Dr. Umesh Adhikari (2016–2017), Dr. Yiseul Kim (2015-2016)  
Dr. Amanda Herzog (2014-2015), Dr. Kyle Enger (2012-2013), Dr. Elaheh Esfahanian (2016)

#### **Undergraduate Research Mentees (14 total – Fall 2012 to present; only current shown)**

	<b>Student</b>	<b>Major</b>	<b>Institution</b>	<b>Period</b>
1.	Natalie Coaster	Biosystems Engineering	MSU	Fall 2018 - present
3.	Esha Jain	Biosystems Engineering	MSU	Fall 2017-present

#### **PROFESSIONAL SERVICE** (postgraduate only)

##### **As a Reviewer or Editor**

2014-present Editorial Board, Microbial Risk Analysis, Elsevier ISSN: 2352-3522  
2014-present Editorial Board, Global Water Pathogens Project (waterpathogens.org)  
2012-present Editor for Risk Management and Developer of the QMRA Wiki (qmrawiki.canr.msu.edu)  
2013 Proposal Reviewer for the U. S. EPA STAR Grants; NIH P4 Center Grants  
Ongoing Ad-hoc Journal Referee for *Risk Analysis*, *Environmental Science and Technology*, *Water Quality, Exposure and Health*, *Science of the Total Environment*, *International Journal of Molecular Sciences*

##### **National Disciplinary Service (last 5 years only)**

2019 Symposium Chair, “Advances in Antibiotic Resistance Risk Assessment” Society for Risk Analysis Annual Meeting, (December 8-12, 2019)  
2018 Symposium Chair, “Presence and Survival of Microbial Pathogens in Environment and Supply Chain,” Society for Risk Analysis Annual Meeting, (December 2 – 6, 2018)  
2017 Symposium Co-Chair, “Understanding Antimicrobial Resistance as a Global Concern, ” Society for Risk Analysis Annual Meeting, (December 10-13, 2017)  
2017 Symposium Chair and Organizer, “An Interdisciplinary Analysis of Multiple Risks and Lessons Learned from Flint, Michigan”, Society for Risk Analysis Annual Meeting, (December 10-13, 2017)  
2017 Session Chair, “Assessment, mitigation, stewardship; human impact”, 4th International Symposium on the Environmental Dimension of Antibiotic Resistance (EDAR), East Lansing, MI, USA. (August 13-17, 2017)  
2017 Local Organizing Committee, Quantitative risk assessment, 4th International Symposium on the Environmental Dimension of Antibiotic Resistance (EDAR), East Lansing, MI, USA. (August 13-17, 2017)  
2016-present Executive Board, Chair (2020), Microbial Risk Analysis Specialty Group, Society for Risk Analysis (SRA). *Elected*  
2014-present Government Affairs Committee, Social Media Reporter, Association of Environmental Engineering and Science Professors (AEESP)  
2014-2015 Advisor to U.S. Navy Regional Center, Singapore on safe drinking water QMRA, (with Engineering Concepts, Inc. Honolulu, Hawaii)  
2015 Reviewer, AEESP Navigating the Job Search Workshop

##### **University Service**

2018-present Women’s Advisory Committee to the Provost  
2016 MSU Representative to North Central Region Antibiotic Resistance Roundtable, Ohio State University, May 19-20, 2016  
2016 Global Impact Initiative Antimicrobial Resistance Steering Committee (Jan. 2016 – present)  
2015-2016 Organizing Committee Member of the MSU Environmental Science and Public Policy (ESPP)

2015-2017      Research Symposium on Environmental Health  
University Strategic Partnership Grant Program (SPG) Environmental Studies and Energy Review  
Panel Member

***College Service***

2018-present      College of Agriculture and Natural Resources – Teaching Awards Selection Committee  
2015-2018      College of Agriculture and Natural Resources – Teaching and Academic Policy Committee  
2015      College of Agriculture and Natural Resources – Evaluation of Faculty Mentoring Committee  
2013-present      College of Engineering - Diversity Initiatives Advisory Committee

***Department Service – last 5 years***

2018-present      Dept. of Biosystems and Agricultural Engineering – Graduate Program Committee  
2018      Dept. of Biosystems and Agricultural Engineering, College of Engineering Graduate Research  
Symposium Poster Judge (March 29, 2018)  
2015      Dept. of Biosystems and Agricultural Engineering - Academics Committee (Fall 2015)  
2015-2016      Dept. of Biosystems and Agricultural Engineering – Food and Health Engineering Search

**PROFESSIONAL AFFILIATIONS (*active*):** Society for Risk Analysis, Member (2007 – Present); Association of Environmental Engineering and Science Professors: Member (2008-Present);