

# Sheldon V. Masters, Ph.D., P.E.

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## EDUCATION

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**Ph.D. Civil Engineering** **2015**

Virginia Tech, Blacksburg, VA

Dissertation: "Lead and Copper contamination in potable water: Impacts of redox gradients, water age, water main pipe materials and temperature". Advisor: Marc A. Edwards

**M.S. Civil Engineering** **2011**

Virginia Tech, Blacksburg, VA

**B.A. Mathematics** **2009**

The College of Wooster, Wooster, OH

## PROFESSIONAL REGISTRATION

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Registered Professional Engineer: State of Delaware, License No. 29746

## PROFESSIONAL EXPERIENCE

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**Assistant Professor** **Aug 2021-Present**

Department of Civil, Environmental & Architectural Engineering  
University of Colorado Boulder

**Affiliated Professor** **Feb 2022-Present**

Materials Science & Engineering Program  
University of Colorado Boulder

**Senior Environmental Engineer** **Aug 2015-July 2021**

Corona Environmental Consulting

**Research Engineer** **Feb 2016-July 2021**

Environmental Science, Policy, and Research Institute

**Visiting Research Professor** **Aug 2017-July 2021**

Department of Civil, Architectural & Environmental Engineering  
Drexel University

**Research Assistant** **Jan 2010-May 2015**

Virginia Tech

## Selected Awards & Honors

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- Discovery Learning Apprenticeship Program 2023-2024 Outstanding Mentor Award.

- Top cited article, 2022-2023: Liggett, J., Baribeau, H., Deshommes, E., Lytle, D., **Masters, S.V.**, Muylwyk, Q, Triantafyllidou (2022). Service Line Material ID Strategies: Experiences from Ten North American Water Systems. *Journal American Water Works Association*. January/February, 9-22.
- Research & Innovation Office Faculty Fellow, 2024
- Outstanding Reviewer, 2022, *Environmental Science: Water Research and Technology*
- 2021 *Environmental Science & Technology* Best Paper Award, Policy Analysis, First Runner-up, **Masters, S.V.**, Bradley, T.C., Burlingame, G.A., Seidel, C.J., Schmelling, M. and Bartrand, T.A. (2021). What Can Utilities Expect from New Lead Fifth-Liter Sampling Based on Historic First-Draw Data? 55(17), 11491-11500.
- Paper selected as an American Chemical Society Editors' Choice for scientific research of broad public interest: Using the Lead and Copper Rule Revisions Five-Sample Approach to Identify Schools with Increased Lead in Drinking Risks (2022). *Environmental Science & Technology Letters*, 9(1), 84-89
- Paper recognized as one of the journal's "High-Impact Articles" between 2015 and 2017: Increased lead in water associated with iron corrosion (2015). *Environmental Engineering Science*, 32(5), 361-369
- *The Inaugural Ut Prosim Scholar Award*, Virginia Tech, 2016, for the application of engaged science in protecting the people of Flint, MI
- *Alumni Award for Outreach Excellence*, Virginia Tech, 2016, in recognition of the Flint Water Study Team for bringing national attention and providing outreach assistance for the Flint, MI water crisis
- *Proclamation from the City Council of the City of West Hollywood*, 2016, in recognition of the Virginia Tech team for its outstanding dedication to representing the public interest, protecting the welfare of Flint residents, and preserving ethical standards in the sciences
- *Association of Environmental Engineering and Science Professors (AEESP) Presentation Award*, Yale University, 2015
- *Graduate Student of the Year*, Virginia Tech, 2015
- *Via Academic Preparation Fellowship*, Virginia Tech, 2014
- *Virginia American Water Works Association Graduate Scholarship*, Third Place, 2013
- *Global Perspectives Fellowship*, Virginia Tech, 2013. Award is aimed at preparing future academic leaders for the challenges of an increasingly diverse and globally focused higher education sector.
- *Future Professoriate Graduate Certificate*, Virginia Tech, 2012
- *Interdisciplinary Graduate Education Program (IGEP) Fellowship*, Virginia Tech, 2011
- *Edna Bailey Sussman Fellowship*, Virginia Tech, 2011
- *Virginia Water Environment Association Student Design Competition*, First Place: "Preliminary Engineering Report for the 2 MGD Strasburg Sewage Treatment Plant Expansion", 2010

## PUBLICATIONS

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Student co-authors supervised by S.V. Masters are denoted by †; \*Corresponding author.

### Papers in refereed journals (Google Scholar h-index: 15, citations: 1312)

1. Samson, C. C., **Masters. S.V.**, Mathews, C. Seidel C.J (2024). Estimating the Impact of the Proposed Lead and Copper Rule Improvements. *AWWA Water Science*.

2. Samson, C., Seidel, C. **Masters, S.** (2024). Impacts of Setting a Numeric Minimum Disinfectant Residual for Public Water System Distribution Systems. *AWWA Water Science*, 6, e1379.
3. Bradley, T.C., **Masters, S.V.**, Bartrand, T.A. (2024). Estimating Impacts of LCRR's Fifth-Liter Sampling and Find-and-Fix Requirements on Large Water Systems. *Environmental Science: Water Research & Technology*, DOI: 10.1039/d3ew00631j
4. Aljadani, A.,<sup>†</sup> Corwin, C., Woodrow, A. H., Poncelet-Johnson, N. Seidel, C., **Masters. S.V.\*** Efficacy of Pitcher Filters for Drinking Water Lead Reduction: A Challenge and Demonstration Study in Denver, CO. *ACS ES&T Water*, 3(1) 3323-3334.
5. Duarte Batista, M., R.S. Summers, Batrand, T., Yu, Y., Seidel, C., and **Masters, S.V.\*** (2023). Trihalomethane, haloacetic acid, haloacetonitrile behavior in electric storage water heaters. *Environmental Science: Water Research & Technology*, 9, 2965-2978.
6. Edwards, M., Arnold, R., Rosenfeldt, B., **Masters, S.V.**, Parks, J., Tang, M. (2023). Utility Considerations in Developing a Galvanized Iron Water Pipe Management Plan. *AWWA Water Science*, 5(4), e1350.
7. McCuin, R., **Masters, S.**, Bartrand, T., Clancy, J. (2022). Impact of Pipe Material, Operation and Disinfectant on Cold Water Plumbing Microbiology. *AWWA Water Science*, 4(5), e1306.
8. **Masters. S.V.,\*** Poncelet-Johnson, N., Walsh, R., Seidel, C.J., Corwin, C.J. (2022). Comparison of Coupon and Pipe Rack Studies for Selecting Corrosion Control Treatment. *AWWA Water Science*, 4(4), e1293.
9. Tolofari, D.L., Bartrand, T., **Masters, S.V.**, Duarte Batista, M., Haas, C.H., Olson, M., Gurian, P.L. (2022). Influence of hot water temperature and use patterns on microbial water quality in building plumbing systems. *Environmental Engineering Science*, 39(4), 309-319.
10. Rome, M., Estes-Smargiassi, S., **Masters, S.V.**, Roberson, A., Beighley, R.E., Pieper, K.J. (2021). Using the Lead and Copper Rule Revisions 5-sample approach to identify schools with increased lead in drinking water risks. *Environmental Science & Technology Letters*, 9(1), 84-89.
11. **Masters, S.V.,\*** Bradley, T.C., Burlingame, G.A., Seidel, C.J., Schmelling, M. and Bartrand, T.A. (2021). What Can Utilities Expect from New Lead Fifth-Liter Sampling Based on Historic First-Draw Data? *Environmental Science & Technology*, 55(17), 11491-11500.
12. Tolofari, D.L., **Masters, S.V.**, Bartrand, T., Hamilton, K.A., Haas, C.N., Olson, M., Summers, R.S., Rasheduzzaman, M., Young, A., Singh, R., Gurian, P. (2020). Full Factorial Study of Plumbing Design and Operation on Building Water Quality. *AWWA Water Science*, 2(5), 1-17.
13. Singh, R., Hamilton, K.A., Rasheduzzaman, M., Yang, Z., Kar, S., Fasnacht, A., **Masters, S.V.**, Gurian, P.L. (2020). Managing Water Quality in Premise Plumbing: Subject Matter Experts' Perspectives and a Systematic Review of Guidance Documents. *Water*, 12(2), 347.

14. Ragain, L., **Masters, S.V.**, Bartrand T., Clancy, J. and Whelton, A. (2019). Analysis of Building Plumbing System Flushing Practices and Communications. *Journal of Water and Health*, 17(2), 196-203.
15. Katner, A., Pieper, K., Brown, K., Lin, H., Parks, J., Wang, X., Hu, C., **Masters, S.V.**, Mielke, H. and Edwards, M. (2018). Effectiveness of Prevailing Flush Guidelines to Prevent Exposure to Lead in Water. *International Journal of Environmental Research and Public Health*, 15(7), 1537.
16. **Masters, S.V.**,\* Welter, G. and Edwards M. (2016). Seasonal Variations in Lead Release to Potable Water. *Environmental Science & Technology*, 50(10), 5259-5277.
17. **Masters, S.V.**,\* Parks, J., Atassi, A. and Edwards M. (2016). Inherent Variability of Lead and Copper Concentrations Collected During Standardized Sampling. *Environmental Monitoring and Sampling*. 188(3), 1-15.
18. Wang, H, **Masters, S.V.**, Falkinham, J., Edwards, M. and Pruden A. (2015). Distribution System Water Quality Affects Responses of Opportunistic Pathogen Gene Markers in Household Water Heaters. *Environmental Science & Technology*, 49(14), 8416-8424.
19. **Masters, S.V.**,\* Parks, J., Atassi, A., Pruden A. and Edwards M. (2015). Distribution System Water Age Can Create Premise Plumbing Corrosion Hotspots. *Environmental Monitoring and Assessment*, 187(9), 1-18.
20. Clark, B., **Masters, S.V.** and Edwards M. (2015). Lead Release to Drinking Water from Galvanized Steel Pipe Coating. *Environmental Engineering Science*, 32(8), 713-721.
21. **Masters, S.V.**\* and Edwards M. (2015). Increased Lead in Water Associated with Iron Corrosion. *Environmental Engineering Science*, 32(5), 361-369.  
(Top-cited article 2015 & 2017)
22. **Masters, S.V.**,\* Wang, H., Pruden, A. and Edwards, M. (2015). Redox Gradients in Distribution Systems Influence Water Quality, Corrosion, and Microbial Ecology. *Water Research*, 68 (1), 140-149.
23. Clark, B., **Masters, S.V.** and Edwards, M. (2014). Profile Sampling to Characterize Particulate Lead Risks in Potable Water. *Environmental Science & Technology*, 48(12), 6836-6843.
24. Wang, H., **Masters, S.V.**, Edwards, M., Falkinham, J. and Pruden A. (2014). Effect of Disinfectant, Water Age, and Pipe Materials on Eukaryotic Community Structure in Drinking Water Biofilm. *Environmental Science & Technology*, 48(3), 1426-1435.
25. Wang, H., **Masters, S.V.**, Hong, Y., Stallings, J., Falkinham, J., Edwards, M. and Pruden, A. (2012). Effect of Disinfectant, Water Age, and Pipe Material on Occurrence and Persistence of *Legionella*, *Mycobacteria*, *Pseudomonas aeruginosa*, and Two Amoebas. *Environmental Science and Technology*, 46(21), 11566-11574.

### Papers in non-refereed journal

1. Liggett, J., Baribeau, H., Deshommes, E., Lytle, D., **Masters, S.V.**, Muylwyk, Q, Triantafyllidou (2022). Service Line Material ID Strategies: Experiences from Ten North American Water Systems. *Journal American Water Works Association*. January/February, 9-22.  
(Top-cited article 2022-2023)
2. Tang, M., Schock, M.R., Buse, H.Y., Lytle, D.A., Fields, R., **Masters. S.V.**, Triantafyllidou, S., (2021). Understanding Copper Pitting in Drinking Water Pipes. *Opflow*, 47(8), 20-22.
3. **Masters, S.V.**, Bartrand, T.A., Seidel, C.J. (2020). Examining the Proposed Lead and Copper Rule Trigger Level. *Journal American Water Works Association*, 112(11), 40-50.
4. Burlingame, G.A. and **Masters, S.V.** (2019). “Rinsing the Tap” Advisories Are a Refreshing Measure. *Opflow*, 45(5).
5. Mofidi, A., Lytle, D., **Masters, S.V.**, Sidari, F. and Krause, J.D. (2019). Consider Common Management and Treatment Approaches to Control *Legionella* Bacteria. *Opflow*, 45(3).

### Papers in revision

- Bradley, T.C., **Masters, S.V.**, Sales, C.M. Developing Nitrification Action Levels for Drinking Water Systems Using a Data-Driven Approach (in preparation for submission to *AWWA Water Science*).

### Papers in review

- Alfredo, K., Bedard, E., Buse, H., Cazals, M., Francisco, P., Lee, J., Masters, S.V., Osann, E., Stillwell, A., Westerhoff, P., Bartrand, T. Ten questions concerning building hot water systems (in review in *Building and Environment*)

### Papers in preparation

- **Masters, S.V.**, Summers, R.S., Yun, Y., Duarte Batista, M., Young, A., Tolofari, D.L., Seidel, C.S., Bartrand, T.A. Impact of cold-water plumbing system design and operational choices on point of use disinfection byproduct concentration (in preparation for submission to *ACS ES&T Water*).
- Pieper, K.J., Osman, K. K., Capone, D.S., **Masters. S.V.**, Jones, A.D., Pierce, G., Jones, N., Mok, K. Systematic review of water contamination in North Carolina (in preparation for submission to *Environmental Science: Water Research & Technology*).

### Research Reports

1. Slabaugh, R., **Masters, S.**, Hill, A., Kutzing, S., Nystrom, V., Arnold, R. (In revision) AWWA M58 Internal Corrosion Control in Water Distribution Systems, Chapter 5: Tools to Evaluate Corrosion Control and Metals Release.

2. Edwards, M., Mohsin, H., Parks, J., **Masters, S.**, Arnold, R. and Rosenfeldt, B. (2022). Evaluating Key Factors that Affect the Accumulation and Release of Lead from Galvanized Pipes. Water Research Foundation Project 4910 Final Report. Water Research. Denver, CO, 123 pages.
3. **Masters, S.V.**, Clancy, J.L., Villegas, S., LeChevallier, M. and Bukhari, Z. (2018). Customer Messaging on Opportunistic Pathogens in Plumbing Systems. Water Research Foundation Project 4664 Final Report. Water Research Foundation. Denver, CO 92 pages.
4. Bartrand, T., **Masters, S.V.**, Clancy, J., Ragain, L., Whelton, A. and Casteloes, K. (2018). Flushing Guidance for Premise Plumbing and Service Lines to Avoid or Address a Drinking Water Advisory. Water Research Foundation Project 4572 Final Report. Water Research Foundation. Denver, CO, 92 pages.
5. Pruden, A., Edwards, M.A., Falkinham, J. O., Arduino, M., Bird, J., Birdnow, R., Bédard, E., Camper, A., Clancy, J., Hilborn, E., Hill, V., Martin, A., **Masters, S.V.**, Pace, N.R., Prevost, M., Rosenblatt, A., Rhoads, W.J., Stout, J.E. and Zhang, Y. (2013). Research Needs for Opportunistic Pathogens in Premise Plumbing: Methodology, Microbial Ecology, and Epidemiology. Water Research Foundation Project 4379 Final Report. *Water Research Foundation*. Denver, CO, 188 pages.
6. **Masters, S.V.** (2013). Training Ethical Researchers: A Comparative Analysis. *Global Perspectives Programme*. Universitat Basel, Switzerland.

## CONFERENCE PRESENTATIONS

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Student co-authors supervised by S.V. Masters are denoted by †

1. Liggett, J., † Schwer, P., Muldoon, T., **Masters, S.**, Fierer, N., Lytle, D. Blended to Orthophosphate Corrosion Control: Impacts on Consumer Lead Exposure, Pipe Scale Mineralogy, and Microbial Ecology. AWWA Water Quality Technology Conference. Schaumburg, IL. Oral Presentation. Nov. 17-21, 2024.
2. Boesnisch-Oakes, K., † **Masters, S.**, Summers, R.S. Salinization of Source Waters, From Aquifers to Rivers: Impact on DBP Formation and Speciation. AWWA Water Quality Technology Conference. Schaumburg, IL. Oral Presentation. Nov. 17-21, 2024.
3. Boesnisch-Oakes, K., † **Masters, S.**, Summers, R.S. Influence of Corrosion Products and pH on DBP Formation in Conventional and Potable Reuse Drinking Water. AWWA Water Quality Technology Conference. Schaumburg, IL. Oral Presentation. Nov. 17-21, 2024.
4. Boronski, C., † **Masters, S.**, Toney, M., Hatch, C. Lead Pipe Scale Corrosion Control Treatment: Better Informed by 3D X-ray Imaging Technique. AWWA Water Quality Technology Conference. Schaumburg, IL. Oral Presentation. Nov. 17-21, 2024.
5. Seidel, C., Causey, J., Mathews, C., **Masters, S.** Kennedy, J., Mattson, S., Dickie, B. Assessing *Legionella* Concerns in Grand Rapids, MN Undisinfected Groundwater Supply System. AWWA Water Quality Technology Conference. Schaumburg, IL. Oral Presentation. Nov. 17-21, 2024.

6. Boesnisch-Oakes, K.,† **Masters, S.**, Summers, R.S. DBP Formation, Transformation, and Relative Toxicity in Conventional and Direct Potable Reuse Drinking Waters. SETAC North America 45<sup>th</sup> Annual Meeting. October 2024.
7. Moloney, K., Akhter, A., Guzan, M., Hayes, W., **Masters, S.**, Estes-Smargiassi, S., Pinto, A., Pieper, K. Impact of Short and Long-term Stagnation on Corrosion in Drinking Water Distribution Systems. New England Water Environmental Association 2023 Annual Conference & Exhibit. January 23, 2023
8. Edwards, M., Tang, M., Parks, J., **Masters, S.**, Rosenfeldt, B., Arnold, R. (2022). Evaluating Key Factors that Affect the Accumulation and Release of Lead from Galvanized Pipes. AWWA Water Quality & Technology Conference. Oral Presentation. November 16, 2022
9. **Masters, S.V.** Disinfection Byproduct Formation in Hot Water Systems. National Science Foundation (NSF) Hot Water System Workshop. Oral Presentation. Jan. 28, 2022.
10. Seidel, C., Corwin, C., Samson, C., **Masters, S.V.**, Johnson, Sierra, and Poncelet-Johnson, N. Comparing Estimated Impacts of OCCT and Lead Reduction Plan Implementation on Lead Exposure at Denver Water Customers. Virtual Summit AWWA Water Quality & Technology Conference. Oral Presentation. Dec. 8-10, 2020.
11. Corwin, C., Poncelet-Johnson, N., Rosenkrance, C., **Masters, S.V.**, and Seidel, C. Lead Pilot Rack vs. Coupon Studies for Assessing Corrosion Control Treatment. Virtual Summit AWWA Water Quality Technology Conference. Oral Presentation. Dec. 8-10, 2020.
12. Henrie, T., Rinde, B., and **Masters, S.V.** Proactive Corrosion Control Treatment Evaluation. AWWA CA-NV Fall Conference. San Diego, CA. Oral Presentation. Oct. 21-24, 2019.
13. **Masters, S.V.** Water Use Patterns and Pipe Materials Influence DBP Formation and Microbial Succession. AWWA CA-NV Fall Conference. San Diego, CA. Oral Presentation. Oct. 21-24, 2019.
14. Katner, A., Parks, J., Pieper, K., Tang, M., Brown, K., Lin, H., Wang, X., Hu, C., **Masters, S.V.**, Mielke H. and Edwards, M. Practical Limitations Associated with Exposure Prevention Guidelines and Health Goals for Lead in Tap Water. Children's Environmental Health Symposium. New Orleans, LA. Oral Presentation. June 10-11, 2019.
15. **Masters, S.V.**, Bartrand, T., McCuin, R. and Clancy, J.L. Disinfection Type, Water Use, and Material Selection Influence Opportunistic Pathogen Ecology and Succession. AWWA Annual Conference & Exposition. Denver, CO. Poster Presentation. June 9-12, 2019.
16. Rasheduzzaman, M., Gurian, P., Hamilton, K., Yang, Z., Kar, S. and **Masters, S.V.** Guidance Documents and Subject Matter Expert Views on Premise Plumbing: Current Knowledge, Gaps, and Research Priorities. AWWA Annual Conference & Exposition. Denver, CO. Poster Presentation. June 9-12, 2019.
17. Duarte Batista, M., Yu, Y., Bartrand, T., Tolofari, D., Seidel, C., **Masters, S.V.** and Summers, R. S. Impact of Water Use Pattern, Disinfectant Type and Temperature on Water

Quality in Storage-Type Water Heaters. 16<sup>th</sup> Annual Rocky Mountain Student Conference. Oral Presentation. May 13, 2019.

18. Clancy, J.L., Bartrand, T., McCuin, R. and **Masters, S.V.** A Comparison Study: Opportunistic Pathogens in Two Drinking Water Systems. International Symposium on Waterborne Pathogens. Tampa, FL. Oral Presentation. April 29-30, 2019.
19. Bartrand, T. and **Masters, S.V.** Building Water Network Contaminant Transport. AWWA Water Quality Technology Conference. Toronto, Canada. Oral Presentation. Nov. 11-15, 2018.
20. **Masters, S.V.** Water Heater Temperature Set Point Impacts on Downstream Water Quality. AWWA Water Quality Technology Conference. Toronto, Canada. Oral Presentation. Nov. 11-15, 2018.
21. Bradley, T., Bartrand, T. and **Masters, S.V.** Developing a New Approach for Proactive Nitrification Monitoring in a Chloraminated Drinking Water Distribution System. AWWA Water Quality Technology Conference. Toronto, Canada. Oral Presentation. Nov. 11-15, 2018.
22. **Masters, S.V.** The How-to's of Developing a Building Water Management Plan. AWWA Water Quality Technology Conference. Toronto, Canada. Oral Presentation. Nov. 11-15, 2018.
23. **Masters, S.V.** Evaluation of Lead Sampling Strategies and Regulations. UCOWR/NIWR Annual Water Resources Conference. Pittsburgh, PA. Oral Presentation. June 26-28, 2018.
24. **Masters, S.V.** Residual Monitoring, Maintenance and Effectiveness in Large Buildings. AWWA Water Quality Technology Conference. Portland, OR. Oral Presentation. Nov. 12-16, 2017.
25. **Masters, S.V.** Flushing Strategies for Contaminant Removal in Building Plumbing Systems. AWWA Water Quality Technology Conference. Portland, OR. Oral Presentation. Nov. 12-16, 2017.
26. Hargy, T. and **Masters, S.V.** Building Water Quality Gone Wrong – Case Studies. AWWA Water Quality Technology Conference. Portland, OR. Oral Presentation. Nov. 12-16, 2017.
27. Bartrand, T., **Masters, S.V.**, Hargy, T. and Fong, T. Pilot Monitoring Study of Water Quality in a Building System. AWWA Water Quality Technology Conference. Portland, OR. Oral Presentation. Nov. 12-16, 2017.
28. **Masters, S.V.** Case Studies in Managing Building Water Quality: *Legionella*, Corrosion, and Discolored Water. CWWA National Water and Wastewater Conference. Newfoundland, Canada. Oral Presentation. Nov 5-8, 2017.



29. **Masters, S.V.**, Parks, J., Atassi, A. and Edwards, M. Inherent Variability of Lead and Copper Concentrations Collected During Standardized Sampling. International Symposium on Inorganics. Detroit, MI. Oral Presentation. March 21-22, 2017.
30. **Masters, S.V.**, Welter, G. and Edwards, M. Seasonal Variations in Lead Release to Potable Water. 17<sup>th</sup> Canadian National Conference on Drinking Water. Ottawa, Canada. Oral Presentation. October 16-18, 2016.
31. Pati, P., **Masters, S.V.** and Vikesland, P. Incorporating Ethics into Undergraduate Environmental Engineering Course Increases Students' 'Conscious Incompetence' and Awareness of Ethics Issues. 2015 AEESP Research and Education Conference. Yale University. New Haven, CT. Oral Presentation. June 13-16, 2015.
32. Wang, H., **Masters, S.V.**, Edwards, M., Falkinham, J. and Pruden, A. Effect of Water Quality in the Distribution System on Regrowth Potential of Opportunistic Pathogens in Premise Plumbing. AWWA Water Quality Technology Conference. New Orleans, LA. Oral Presentation. November 16-20, 2014.
33. Shanks, J., DePauw, K., Anderson, A., Brunton, K., Duckson, M., Henry, D., **Masters, S.V.** and Stewart, M. Global Times Call for Global Perspectives: How Virginia Tech Prepares Graduate Students to Become Globally Engaged Faculty Members. Deans' Forum on Global Engagement: Developing a Community of Excellence. Virginia Tech. Blacksburg, VA. Oral Presentation. March 27, 2014.
34. **Masters, S.V.** and Edwards, M. Holistic Examination of Lead Corrosion Control in Low Alkalinity High pH Water Distributed Though Unlined Iron Mains. Presented at AWWA Water Quality Technology Conference. Long Beach, CA. Oral Presentation. November 3-7, 2013.
35. Parks, J., Atassi, A., **Masters, S.V.** and Edwards, M. Portable Test Rig for Assessing Lead and Copper Corrosion in Water Systems. AWWA Water Quality Technology Conference. Long Beach, CA. Poster Presentation. November 3-7, 2013.
36. **Masters, S.V.**, Pruden, A. and Edwards, M. Effect of Water Age and Distribution Pipe Material on Denitrification in a Simulated Drinking Water Distribution System. AWWA Water Quality Technology Conference. Toronto, ON, Canada. Oral Presentation. November 4-8, 2012.
37. Clark, B., **Masters, S.V.** and Edwards, M. 3-D Lead Profiling Detects Particulate Lead-in-Water Risks as a Function of Flow Rate. AWWA Water Quality Technology Conference. Toronto, ON, Canada. Oral Presentation. November 4-8, 2012.
38. Martin A., **Masters S.V.**, Rhoads W., Pruden A., Falkinham J., and Edwards M. Indirect Impacts of Premise Plumbing on Disinfectant Decay. AWWA Water Quality Technology Conference. Toronto, ON, Canada. Oral Presentation. November 4-8, 2012

39. **Masters, S.V.** and Edwards, M. Effect of Water, Disinfectant, and Distribution Pipe Material on Lead and Copper Corrosion. AWWA Annual Conference & Exposition, Dallas, TX. Oral Presentation. June 10-14, 2012.
40. Lieberman, R.H., Edwards, M. and **Masters, S.V.** Evaluating Water Quality and Energy Efficiency of Standard and Marketed "Green" Home Water Heating Systems. AWWA Water Quality Technology Conference. Savannah, GA. Poster Presentation. November 29, 2010.
41. Lieberman, R.H., Edwards, M. and **Masters, S.V.** Sustainability of Residential Hot Water Infrastructure: Public Health, Environmental Impacts, and Consumer Drivers. AWWA Annual Conference & Exposition. Oral Presentation. Chicago, IL. June 22, 2010.

## INVITED TALKS

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1. Distributions Systems as a Public Health Battlefield of the 21<sup>st</sup> Century: Fate and Transport of Lead, Pathogens and Disinfection Byproducts. Colorado School of Mines, Golden, CO, April 19, 2024
2. Building Water Management Plans & Why They're Needed for Control of Corrosion, *Legionella* and Other Pathogens. Caribbean Water and Wastewater Association 30<sup>th</sup> Annual Conference & Exhibition 2021.
3. Supplemental Disinfection Systems. Washington DC Health Department, Washington, DC, June 25, 2019.
4. Managing Water Quality in Buildings. Health Canada, Ottawa, Canada, May 7, 2019.
5. Building Water Management Plans & Why They're Needed for *Legionella* and Other OPPPs Control. Department of Environment and Parks, Government of Alberta, Canada, July 13, 2017.
6. Costly Cost Savings: The Flint Water Crisis. New Jersey American Water Works Association, Sayreville, NJ, May 18, 2016.
7. Drinking Water Challenges: Perspectives from Drinking Water Professionals. Clean Water Action Spring Leadership Conference, Elmer, NJ, April 29, 2016.
8. Lead in Drinking Water: An Overview of Sampling and Corrosion [Webinar]. In *Lead, drinking water and our Region: Regulation, history and science*. Hosted by Metropolitan Washington Council of Governments, February 4, 2016.
9. Lead Contamination in Drinking Water: Unintended Consequences of Changing Water Quality. Rutgers University, Department of Civil and Environmental Engineering, New Brunswick, NJ, October 14, 2015.

## TEACHING EXPERIENCE

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**Instructor of Record**  
 CVEN 5524: Drinking Water Treatment (CU Boulder)

**Spring 2022, 2024**

Graduate course on the advanced theory of treatment processes, including design and operation of municipal water supplies.

**Instructor of Record**

**Fall 2021, 2022, 2023, 2024**

CVEN 3414: Fundamentals to Environmental Engineering (CU Boulder)

Junior-level undergraduate course examining key concepts in water and air pollution, hazardous waste, environmental legislation, and global atmospheric change.

**Instructor of Record**

**Fall 2014**

CEE 3104: Introduction to Environmental Engineering (Virginia Tech)

Upper-level undergraduate course examining key concepts in water and air pollution, hazardous waste, environmental legislation, and global atmospheric change.

**Instructor of Record**

**Fall 2012**

GRAD 5014: Academic Integrity and Plagiarism (Virginia Tech)

One-credit graduate course examining academic integrity, responsible scholarly conduct, and methods of citation, especially as they relate to the Virginia Tech Graduate Honor System.

**Guest Lecturer**

**Oct 2014**

ENGE 1215: Foundations of Engineering (Virginia Tech)

Undergraduate course introducing students to 'being an engineer', design basics and problem-based learning.

**Guest Lecturer**

**Aug 2014**

CEE 1415: Scholarly Ethics and Integrity in Graduate Education (Virginia Tech)

Graduate seminar introducing students to academic integrity and responsible research conduct.

**Teaching Assistant (Virginia Tech)**

**Fall 2011**

CEE 5804: Engineering Ethics and the Public

Graduate course exploring the cultural and moral dimensions of science and engineering decision-making in practice.

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**PROFESSIONAL ACTIVITIES**

**Professional and Academic Organizations**

- Journal American Water Works Association Advisory Board, 2023-Present
- Professional Memberships:
  - *Association of Environmental Engineering and Science Professors*
  - *American Society of Civil Engineers*
  - *American Water Works Association:*
    - Copper Committee
    - Distribution System Committee
    - Inorganics Committee
    - Lead in Water Committee
    - Organisms in Water Committee
    - Premise Plumbing Committee

- *National Society of Black Engineers*
- National Sanitation Foundation International Joint Committee on Prevention of Injury and Disease Associated with Building Water Systems (committee member, June 2015-June 2019)
- Guest Editor for the journal *Water* special issue “Water Conservation, Water Quality, and Public Health”. Issue June 2021

**Department Service**

- Co-Director of Graduate Studies (Fall 2022-Summer 2023)
- EVEN Graduate Committee (Fall 2022-Present)

**Journal Peer Reviewer**

- *ACS ES&T Water*
- *AWWA Water Science*
- *Chemical Engineering Journal*
- *Corrosion Science*
- *Environmental Engineering Science*
- *Environmental Pollution*
- *Environmental Science: Advances*
- *Environmental Science and Pollution Research*
- *Environmental Science & Technology*
- *Environmental Science: Water Research and Technology*
- *Journal American Water Works Association*
- *Journal of Environmental Engineering*
- *Journal of Environmental Management*
- *Journal of Environmental Science and Health, Part A*
- *Journal of Hazardous Materials*
- *Journal of Microbiology*
- *Journal of Sustainable Mining*
- *Science of the Total Environment*
- *Water*
- *Water Practice and Technology*
- *Water Research*

**Proposal Reviewer**

- National Science Foundation SBIR/STTR: Phase 1 Water Treatment Technologies, 2023

**STUDENTS SUPERVISED**

**Graduate Students**

<b>Name</b>	<b>Degree</b>	<b>Date</b>	<b>Dissertation/Thesis Title</b>
Aljadani, Abdulrahman	Ph.D.	Expected 2028	Impact of Water Age on the Fate of Unregulated Disinfection By-Products
Boenisch-Oakes, Kylie	Ph.D.	Expected 2027	Fate and Transport of Unregulated Disinfection By-Products in Distribution

<b>Name</b>	<b>Degree</b>	<b>Date</b>	<b>Dissertation/Thesis Title</b>
			Systems with Impaired Sources (Co-advised by R. Scott Summers)
Liggett, Jennifer	Ph.D.	Expected 2027	Impact of Climate Change and Changing Regulations on Drinking Water Lead Compliance
Boronski, Claire	Ph.D.	Expected 2025	Characterizing Lead Pipe Scales using Novel Non-destructive Imaging Techniques (Co-advised by Michael Toney)
Aljadani, Abdulrahman	MSc.	May 2023	Efficacy of Pitcher Filters for Drinking Water Lead Reduction: A Challenge and Demonstration Study in Denver Water

### **Service on Graduate Student Committees**

<b>Name</b>	<b>Degree</b>	<b>Date</b>	<b>Dissertation/Thesis Title</b>
Hernandez, Michael	MSc.	July 2022	Granular activated carbon use for the control of regulated and unregulated organic contaminants (Chair: R. Scott Summers, Committee members: Chris J. Corwin)
Lee, Sangsuk	Ph.D.	May 2023	Mass transport and wettability of hydrophobic membranes for distillation processes (Chair: Anthony Straub, Committee members: Yifu Ding, Julie Korak, Michael R. Shirts)
Liu, Bryan (Xuan)	Ph.D.	December 2023	Enhancing Contaminant Degradation Using Low Wavelength Driven AOPs in Water Treatment (Chair: Karl Linden, Committee members: Fernando Rosario-Ortiz, Michael J. Watts, Sydney Vinge)
Cairney, Hannah	MSc.	May 2024	Impact of Oxidative Chemicals on Hydrophobic Porous Membranes Used in Membrane Distillation (Chair: Anthony Straub, Committee members: Karl Linden)
Ferrebee, Madison	Ph.D.	Present	Utilizing UV LEDs to prevent biofilm growth and reduce the burden of opportunistic pathogens within drinking water distribution systems (Chair: Karl Liden, Committee members: Cresten Mansfeldt, Emily Garner, Natalie Hull)
Jorgenson, Nadia	Ph.D.	Present	GAC Adsorption of Pre-formed DBPs for Water Reuse (Chair: R. Scott Summers,

<b>Name</b>	<b>Degree</b>	<b>Date</b>	<b>Dissertation/Thesis Title</b>
			Committee members: Julie Korak, Eric Peterson, Anthony Kennedy)
Laris, Omar	Ph.D.	Present	Hydrogel-Enhanced Evaporation in Pressure-Driven Membrane Distillation (Chair, Anthony Straub Yifu Ding, Wil Srubar)
Norris, Kari	Ph.D.	Present	Photochemical production and transformation of reactive species in surface waters: hydroxyl radicals, cyanobacterial toxins, and pigments (Chair: Fernando Rosario-Ortiz, Committee members: Joseph Ryan)
Payne, Emma	Ph.D.	Present	Improving UV advanced oxidation efficiency through tailored wavelength and radical promoter innovations (Chair: Karl Linden, Committee: Julie Korak, Fernando Rosario Ortiz, Rachel Scholes)
Wells, Emma	Ph.D.	Present	Organizing for Safe Water Services: Identifying Pathways to Successful Risk Management (Chair: Karl Linden, Committee members: Amy Javernick-Will, Megan Fuller, Lauryn Spearing)