

Ryan Cronk

Durham, North Carolina (USA)
+1 757.839.7218 (mobile) * rcronk@alumni.unc.edu

Education

University of North Carolina, Chapel Hill, NC. *Gillings School of Global Public Health* **Jan 2014 – Aug 2017**
Doctor of Philosophy (Ph.D.) in Environmental Sciences & Engineering (Supervisor: Jamie Bartram)

University of North Carolina, Chapel Hill, NC. *Gillings School of Global Public Health* **Aug 2011 – Aug 2013**
Master of Science (M.S.) in Environmental Sciences & Engineering with a certificate in Public Health Informatics

University of Virginia, Charlottesville, VA. *School of Engineering and Applied Science* **Aug 2005 – May 2009**
Bachelor of Science (B.S.) in Systems Engineering with a management concentration and engineering business minor

Work experience

University of North Carolina, Chapel Hill, NC. *Assistant Professor* **Mar 2023 – present**

- Assistant Professor in the Department of Environmental Sciences & Engineering in the Gillings School of Global Public Health
- Director of Research and Student Engagement for the Water Institute at UNC

ICF, Durham, NC. *Lead Environmental Health Scientist* **Mar 2022 – Mar 2023**

ICF, Durham, NC. *Senior Environmental Health Scientist* **May 2020 – Mar 2022**

- Problem-solving consultant, environmental health research scientist, and project manager providing technical support to diverse environmental health risk assessment projects, including the EPA Office of Pollution Prevention and Toxics (OPPT) exposure assessment to support the Toxic Substances Control Act (TSCA), the EPA Office of Water PFOA and PFOS health assessment supporting the Safe Drinking Water Act (SDWA), the NIEHS Environmental Health Language Collaborative (EHLC), and the NIEHS Cardiotoxicity assessment
- As a research project manager for task orders and work assignments ranging from \$50,000 to \$2+ million, I design, implement, and manage government projects and programs. I prepare technical work plans; recruit, train, and manage technical staff; develop and manage project and program budgets; develop training materials; deliver training workshops; recruit and manage sub-contractors; coordinate technical tasks with clients; facilitate client meetings, multitask deliverables; prepare progress reports, manage contract obligations, and contract modifications, and ensure high-quality project deliverables are timely and produced within or under budget.
- My technical contributions include critically analyzing and evaluating toxicological, epidemiological, and exposure evidence across the health risk assessment process. Specific technical expertise includes exposure and epidemiological study screening; literature inventory development; data evaluation and extraction; software tool management and development of data collection instruments; and technical writing and scientific communication.

The Water Institute at UNC (WI), Chapel Hill, NC. *Postdoctoral Research Associate* **Aug 2017 – Apr 2020**

Select projects where I was a lead research scientist and research project manager:

- Monitoring, evaluation, and learning (MEL) of water, sanitation, and hygiene (WASH) programs in 14 countries (supported by World Vision)
- Using data to strengthen national WASH monitoring systems in the Pacific (supported by UNICEF)
- Understanding the life cycle costs of essential environmental conditions in healthcare settings (supported by the Wallace Genetic Foundation)
- Improving essential environmental conditions, energy, sector governance, budgeting, finance, and institutions in the Malawian health and water sectors (in partnership with UNC-Project Malawi, supported by P&G Children's Safe Drinking Water Program)
- Monitoring and reporting Sustainable Development Goal (SDG) Target 6. b on participation in water and sanitation (in partnership with the Stockholm International Water Institute; supported by WHO)
- Understanding environmental risks and exposures in non-household settings (schools, healthcare facilities, prisons, refugee/IDP camps, homeless shelters, and orphanages)

Specific roles and responsibilities:

- Technical lead on a portfolio of four to seven (at any given time) research projects in WI focal areas (e.g., healthcare facilities, water quality, rural water supply, MEL)
- Coordinated, collaborated, and provided program management support for multi-country, multi-partner applied research projects.

- Technical and analytical responsibilities spanned the scientific method, including research question development, literature review, survey design, study design, obtaining ethics approval, developing and implementing data collection protocols, developing MEL frameworks, providing timely and high-quality field support and technical assistance to multi-country partners and data collectors, conducting data quality assurance and quality control, coordinating data management, designing analysis plans and implementing analyses, developing data visualizations and evidence products, evidence synthesis, preparing publications, and communicating scientific findings to scientific and lay stakeholders
- Generated evidence and learning products, including communications, learning briefs, white papers, policy briefs, journal articles, webinars, workshops, and presentations.
- Supervised and advised more than 35 post-docs, staff research assistants, graduate students, and undergraduate students on these respective projects, provided capacity-building support for the WI through teaching, training, and mentoring, and demonstrated excellence in building effective teams and working effectively as part of a team.
- Disseminated study findings to diverse stakeholders at conferences and stakeholder meetings.
- Provided project management support, including developing timelines for different aspects of projects, including data collection, personnel management, data analysis, and major deliverables; coordinated with the finance department to ensure appropriate funds management.
- Supported and led the development of research proposals to diverse funding sources (including federal, private, and non-governmental sources)
- Provided global technical leadership to diverse global stakeholders, including United Nations (UN) agencies

The Water Institute at UNC , Chapel Hill, NC. <i>Ph.D. Research Assistant</i>	<i>Jan 2014 – July 2017</i>
The Water Institute at UNC , Chapel Hill, NC. <i>Staff Research Assistant</i>	<i>May 2013 – Dec 2013</i>
The Institute for the Environment , Chapel Hill, NC. <i>M.S. Graduate Research Assistant</i>	<i>Jan 2012 – Apr 2013</i>
The Water Institute at UNC , Chapel Hill, NC. <i>M.S. Graduate Research Assistant</i>	<i>Sept 2011 – May 2013</i>
Lockheed Martin/The SI Organization , Chantilly, VA. <i>Systems Engineering Associate</i>	<i>Oct 2009 – Aug 2011</i>

Peer-reviewed journal articles (*citations: 4010; h-index: 31 – as of 16 May 2024 from Google Scholar*)

⁶⁴ **Cronk R**, Brocklehurst C, Evans B, Gomez Rodriguez L*, Lantagne D, Mcbroom-Fitterer C, Momany E, Nyarko K, Scharp C. *Accepted, 2024*. Missing in Action: The UN Water Action Agenda needs an overhauled commitment-setting process. *PLoS Water*.

⁶³ **Cronk, R.**, Tracy, J. W., & Bartram, J. (2024). The influence of seasonality and multiple water source use on household water service levels. *Cleaner Water*, 100012.

⁶² Fejfar, D*, Tracy, W, Kelly, E*, Moffa, M*, Bain, R, Bartram, J, Anderson D, **Cronk, R.** (2024). Identifying predictors of E. coli in rural household water in sub-Saharan Africa using elimination regression. *Environmental Science: Water Research & Technology*.

⁶¹ Holmgren S, Bell SM, Wignall J, Duncan C, Kwok RK, **Cronk R**, Osborn K, Black S, Thessen A, Schmitt C. 2023. Workshop Report: Catalyzing Knowledge-Driven Discovery in Environmental Health Sciences through a Harmonized Language. *International Journal of Environmental Research and Public Health* <https://doi.org/10.3390/xxxxx>

⁶⁰ Sprouse L*, Liles A*, **Cronk R**, Bauza V, Tidwell J, Manga M. 2022. Interventions to address unsafe child feces disposal practices in the Asia-Pacific region: a systematic review. *H2Open Journal*. doi: 10.2166/h2oj.2022.137

⁵⁹ Elling H*, Behnke N*, Tseka J, Kafanikhale H, Mofolo I, Hoffman I, Reuland F*, McCord R*, **Cronk R.** 2022. The role of cleaners in establishing and maintaining essential environmental conditions in healthcare facilities in Malawi. *Journal of Water, Sanitation, and Hygiene for Development*. doi: 10.2166/washdev.2022.206

⁵⁸ Tu R*, Elling H*, Behnke N*, Tseka J, Kafanikhale H, Mofolo I, Hoffman I, **Cronk R.** 2022. A qualitative study of barriers and facilitators to adequate environmental health conditions and infection control for healthcare workers in Malawi. *H2Open Journal*. doi: 10.2166/h2oj.2022.139

⁵⁷ Christenson E, **Cronk R**, Atkinson H, Bhatt A, Berdeil E, Cawley M, Cho G, Coleman C, Harrington C, Heilferty K, Fejfar D, Grant E, Grigg K, Joshi T, Mohan S, Pelak G, Shu Y, Bartram J. 2021. Evidence map and systematic review of disinfection efficacy on environmental surfaces in healthcare facilities. *International Journal of Environmental Research and Public Health*. doi: doi.org/10.3390/ijerph182111100

- ⁵⁶ Shields K, Moffa M*, Behnke N, Kelly E, Klug T, Lee K, **Cronk R**, Bartram J. 2021. Community engagement for rural water supplies: Establishing management structures and fostering participation. *Journal of Water, Sanitation, and Hygiene for Development*. doi: doi.org/10.2166/washdev.2021.089
- ⁵⁵ Beardsley R*, **Cronk R**, Tracy W, Fleming L, Ng'ambi M, Tidwell B, Manga M. 2021. Factors associated with safe child feces disposal: evidence across Ethiopia, India, and Zambia. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2021.113832
- ⁵⁴ Holmgren S, Boyles R, **Cronk R**, Duncan C, Kwok R, Lunn R, Osborn K, Thessen A, Schmitt C. 2021. Catalyzing Knowledge-Driven Discovery in Environmental Health Sciences Through a Community-Driven Harmonized Language. *International Journal of Environmental Research and Public Health*. doi: 10.3390/ijerph18178985.
- ⁵³ Moffa M*, **Cronk R**, Fleming L, Tidwell B. 2021. Measuring household hygiene access and handwashing behaviors: Findings from 14 low- and middle-income countries. *International Journal of Hygiene and Environmental Health*. doi: doi.org/10.1016/j.ijheh.2021.113810
- ⁵² Fejfar, D*, Guo, A, Kelly, E, Tidwell, JB, Ochieng, O, **Cronk, R**. 2021. Healthcare provider satisfaction with environmental conditions in rural healthcare facilities. *International Journal of Hygiene and Environmental Health*. doi: doi.org/10.1016/j.ijheh.2021.113802
- ⁵¹ Kmentt L, **Cronk R**, Tidwell B, Rogers E. 2021. WASH in the healthcare facilities of 14 low and middle-income countries: To what extent are Water, Sanitation, and Hygiene implemented, and what are the “drivers” of improvement in their service levels? *H2Open Journal*. doi: 10.2166/h2oj.2021.095
- ⁵⁰ Anderson D, Tracy W, **Cronk R**, Schram H, Behnke N, Bartram J. 2021. A toolkit for costing environmental health services in healthcare facilities. *Journal of Water, Sanitation, and Hygiene for Development*. doi: doi.org/10.2166/washdev.2021.018
- ⁴⁹ Anderson D, **Cronk R**, Pak E, Fuente D, Tracy JW, Mofolo I, Hoffman I, Bartram J. 2021. Development and application of tools to cost delivery of environmental health services in healthcare facilities: financial analysis in urban Malawi. *BMC Health Services*. doi: 10.1186/s12913-021-06325-3
- ⁴⁸ Fisher M, Guo A, Tracy J W, Prasad S, **Cronk R**, Browning E, Liang K, Kelly E, Bartram J. 2021. Occurrence of Lead and other Toxic Metals Derived from Drinking-Water Systems in three West African Countries. *Environmental Health Perspectives*. doi: 10.1289/EHP7804
- ⁴⁷ Anderson D, **Cronk R**, Fejfar D, Pak E, Bartram J. 2021. Safe healthcare facilities: a systematic review on the costs of establishing and maintaining environmental health in facilities in low- and middle-income countries. *International Journal of Environmental Research and Public Health*. doi: 10.3390/ijerph18020817.
- ⁴⁶ **Cronk R**, Guo A, Folz C, Hynes P, Labat A, Liang K, Bartram J. 2020. Environmental conditions in maternity wards: evidence from rural healthcare facilities in 14 low- and middle-income countries. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2020.113681
- ⁴⁵ **Cronk R**, Guo A, Fleming L, Bartram J. 2020. Factors associated with water quality, sanitation, and hygiene in rural schools in 14 low- and middle-income countries. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2020.144226
- ⁴⁴ Cooper B*, Behnke N, **Cronk R**, Banner B, Anthonj C, D'Sousa M, Bartram J. 2021. Environmental health conditions in mid-term displacement settings: a systematic review. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2020.143136
- ⁴³ Kelly E*, **Cronk R**, Fisher M, Bartram J. 2020. Sanitary inspection, microbial water quality analysis and water safety in rural sub-Saharan Africa. *npj Clean Water*. doi: doi.org/10.1038/s41545-020-00093-z
- ⁴² Behnke N*, **Cronk R**, Cooper B, Banner B, D'Sousa M, Bartram J. 2020. Environmental health conditions in protracted displacement: a systematic scoping review. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2020.138234
- ⁴¹ Anderson D, **Cronk R**, Best L, Radin M, Schram H, Tracy JW, Bartram J. 2020. Budgeting for environmental health services in healthcare facilities: a ten-step model for planning and costing. *International Journal of Environmental Research and Public Health*. doi: 10.3390/ijerph17062075

- ⁴⁰ Kelly E*, **Cronk R**, Kumpel E, Howard G, Bartram J. 2020. How we assess water safety: A critical review of sanitary inspection and water quality analysis. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2020.137237
- ³⁹ Oza H*, Fisher M, Abebe L, **Cronk R**, McCord R, Reuland F, Behnke N, Kafanikhale H, Mofolo I, Hoffman I, Bartram J. 2020. Application of tools to monitor environmental conditions, identify exposures, and inform decision-making to improve infection prevention and control practices in Malawian maternity wards. *Environmental Monitoring and Assessment*. doi: 10.1007/s10661-020-8089-5
- ³⁸ Banner B*, **Cronk R**, Behnke N, Cooper B, D'Sousa M, Bartram J. 2020. Environmental health conditions in emergency settings: a systematic review. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2020.136553
- ³⁷ Anthonj C, Fleming L, Thakkar M, Tikosuva W, Shields K, **Cronk R**, Baudry G, Bartram J. 2019. Geographical inequalities in drinking water in the Solomon Islands. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2019.135241
- ³⁶ Setty K, **Cronk R**, George S, Anderson D, O'Flaherty G, and Bartram J. 2019. Adapting translational research for water, sanitation, and hygiene. *International Journal of Environmental Research and Public Health* 16(20): 4049. doi: 10.3390/ijerph16204049
- ³⁵ Reuland F*, Behnke N, **Cronk R**, McCord R, Fisher M, Abebe L, Suhlrie L, Joca L, Mofolo, I, Kafanikhale, H, Mmodzi T, Rehfuess E, Jomaro J, Hoffman I, Bartram J. 2019. Energy access in Malawian health care facilities: consequences for health service delivery and environmental health conditions. *Health Policy and Planning*. doi: 10.1093/heapol/czz118.
- ³⁴ McCord R*, **Cronk R**, Tomaro J, Reuland F, Behnke N, Tseka J, Banda C, Kafanikhale H, Mofolo I, Hoffman I, Bartram J. 2019. The Implementation of Environmental Health Policies in Health Care Facilities: The case of Malawi. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2019.05.003
- ³³ Guo W*, **Cronk R**, Scherer E, Oommen A, Brogan J, Sarr M, Bartram J. 2019. A systematic review of environmental health conditions in penal institutions. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2019.05.001
- ³² Miller M*, **Cronk R**, Klug T, Kelly E, Behnke N, Bartram J. 2019. External support programs to improve rural drinking water service sustainability: a systematic review. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2019.03.069
- ³¹ Jiménez A, LeDeunff H, Giné R, Sjödin J, **Cronk R**, Murad S, Takane M, Bartram J. 2019. The enabling environment for active, free and meaningful participation in water and sanitation: a conceptual framework. *Water*. doi: 10.3390/w11020308
- ³⁰ Moffa M*, **Cronk R**, Fejfar D, Padilla L, Dancausse S, Bartram J. 2019. A systematic review of hygiene behaviors and environmental health conditions in institutional care settings for orphaned and abandoned children. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2018.12.286
- ²⁹ Moffa M*, **Cronk R**, Padilla L, Fejfar D, Dancausse S, Bartram J. 2018. A systematic review of environmental health conditions and hygiene behaviors in homeless shelters. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2018.12.004
- ²⁸ Anthonj C, Fleming L, **Cronk R**, Godfrey S, Ambelu A, Bevan J, Sozzi E, Bartram J. 2018. Improving monitoring and water point functionality in rural Ethiopia. *Water*. doi: 10.3390/w10111591
- ²⁷ Anthonj C, Fleming L, Godfrey S, Ambelu A, Bevan J, **Cronk R**, Bartram J. 2018. Health beliefs matter. Evidence from an evaluation of water and sanitation programme implementation in rural Ethiopia. *International Journal of Environmental Research and Public Health*. doi: 10.3390/ijerph15102112
- ²⁶ Behnke, N*, **Cronk R**, Snel, M, Moffa, M, Tu, R, Banner, B, Folz, C, Anderson, D, McIntyre, A, Stowe, E, Bartram, J. 2018. Improving environmental conditions for involuntarily displaced populations: water, sanitation, and hygiene in orphanages, prisons, and refugee and IDP settlements. *Journal of Water, Sanitation, and Hygiene for Development*. doi: 10.2166/washdev.2018.019
- ²⁵ **Cronk R**, Bartram J. 2018. Identifying opportunities to improve piped water continuity and water system monitoring in Honduras, Nicaragua, and Panama using Bayesian networks and regression. *Journal of Cleaner Production*. doi: 10.1016/j.jclepro.2018.06.017

- ²⁴ Abebe L, Karon A, Kolton A, **Cronk R**, Bain R, Bartram J. 2018. Microbial contamination of non-household drinking water sources: a systematic review. *Journal of Water, Sanitation, and Hygiene for Development*. doi: 10.2166/washdev.2018.080
- ²³ Kelly E*, Shields K, **Cronk R**, Lee K, Behnke N, Klug T, Bartram J. 2018. Seasonality, water use and community management of water systems in rural settings: qualitative evidence from Ghana, Kenya, and Zambia. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2018.02.045
- ²² **Cronk R**, Bartram J. 2018. Environmental conditions in health care facilities in low- and middle-income countries: coverage and inequalities. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2018.01.004
*Publication referenced in a speech by the UN Secretary General in a global call to action on WaSH in health care facilities; cited in news articles in *The Hill*, *Time Magazine*, and *Devex*
- ²¹ Klug T*, **Cronk R**, Shields K, Bartram J. 2018. A categorization of water system breakdowns: evidence from Liberia, Nigeria, Tanzania, and Uganda. *Science of the Total Environment*. doi: 10.1016/j.scitotenv.2017.11.183
- ²⁰ Kelly E*, Lee K, Shields K, **Cronk R**, Behnke N, Klug T, Bartram J. 2017. The role of social capital and sense of ownership in rural community-managed water systems: qualitative evidence from Ghana, Kenya, and Zambia. *Journal of Rural Studies*. doi: 10.1016/j.jrurstud.2017.08.021
- ¹⁹ **Cronk R**, Bartram J. 2017. Factors influencing water system functionality in Nigeria and Tanzania: a regression and Bayesian network analysis. *Environmental Science & Technology*. doi: 10.1021/acs.est.7b03287
- ¹⁸ Moffa M*, Guo W, Li T, **Cronk R**, Abebe L, Bartram J. 2017. A systematic review of nosocomial waterborne infections in neonates and mothers. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2017.07.011.
- ¹⁷ Behnke N*, Klug T, **Cronk R**, Lee K, Kelly E, Shields K, Allgood G, Bartram J. 2017. Resource mobilization for community-managed water systems: evidence from Ghana, Kenya, and Zambia. *Journal of Cleaner Production*. doi:10.1016/j.jclepro.2017.04.016.
- ¹⁶ Klug T*, Shields K, **Cronk R**, Kelly E, Behnke N, Lee K, Bartram J. 2017. Pathways for water system hardware and management rehabilitation: qualitative evidence from Ghana, Kenya, and Zambia. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2017.02.009
- ¹⁵ Karon A*, Cronin A, **Cronk R**, Hendrawan R. 2017. Improving water, sanitation, and hygiene in schools in Indonesia: a cross-sectional assessment on sustaining infrastructural and behavioral interventions. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2017.02.001
- ¹⁴ Li T*, Abebe L, **Cronk R**, Bartram J. 2016. A systematic review of waterborne infections from nontuberculous mycobacteria in health care facility water systems. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2016.12.002.
- ¹³ Fisher M, Mann B, **Cronk R**, Shields K, Klug T, Ramaswamy R. 2016. Evaluating Mobile Survey Tools (MSTs) for field-level monitoring and data collection: development of a novel evaluation framework, and application to MSTs for rural water system monitoring. *International Journal of Environmental Research and Public Health*, 13(9), 840. doi:10.3390/ijerph13090840
- ¹² Schwemlein, S*, **Cronk R**, Bartram, J. 2016. Indicators for Monitoring Water, Sanitation, and Hygiene: A Systematic Review of Indicator Selection Methods. *International Journal of Environmental Research and Public Health*, 13(3), 333. doi:10.3390/ijerph13030333.
- ¹¹ Luh J, **Cronk R**, Bartram J. 2016. Assessing Progress Towards Public Health, Human Rights, and International Development Goals Using Frontier Analysis. *PLoS One*. doi: 10.1371/journal.pone.0147663
- ¹⁰ Williams A, Bain R, Fisher M, **Cronk R**, Kelly E, Bartram J. 2015. A systematic review and meta-analysis of fecal contamination and inadequate treatment of packaged water. *PLoS One*. doi: 10.1371/journal.pone.0140899
- ⁹ Fisher M, Shields K, Chan T, Christenson E, **Cronk R**, Leker H, Samani D, Apoya P, Lutz A, Bartram J. 2015. Understanding handpump sustainability: Determinants of rural water source functionality in the Greater Afram Plains region of Ghana. *Water Resources Research*. doi: 10.1002/2014WR016770

- ⁸ Jordanova T*, **Cronk R**, Obando W, Medina O, Kinoshita R, Bartram, J. 2015. Water, Sanitation, and Hygiene in Schools in Low Socio-Economic Regions in Nicaragua: A Cross-Sectional Survey. *International Journal of Environmental Research and Public Health*, 12(6), 6197. doi: 10.3390/ijerph120606197.
- ⁷ Shields K, Bain R, **Cronk R**, Wright J, Bartram J. 2015. Association of Water Supply Type with Fecal Contamination of Source Water and Household Stored Drinking Water in Developing Countries: A Bivariate Meta-analysis. *Environmental Health Perspectives*. doi:10.1289/ehp.1409002
- ⁶ Amjad U, Ojomo E, Downs K, **Cronk R**, Bartram J. 2015. Rethinking Sustainability, Scalability, and Enabling Environment: A Framework for Their Implementation in Drinking Water Supply. *Water*. doi:10.3390/w7041497.
- ⁵ Bartram J, **Cronk R**, Montgomery M, Gordon B, Neira M, Kelley E, Velleman Y. 2015. Lack of toilets and safe water in health care facilities. *Bulletin of the World Health Organization*. doi:10.2471/BLT.15.154609.
- ⁴ **Cronk R**, Slaymaker T, Bartram J. 2015. Monitoring drinking water, sanitation, and hygiene in non-household settings: priorities for policy and practice. *International Journal of Hygiene and Environmental Health*. doi: 10.1016/j.ijheh.2015.03.003
- ³ Kostyla C*, Bain R, **Cronk R**, Bartram J. 2015. Seasonal variation of fecal contamination in drinking water sources in developing countries: a systematic review. *Science of the Total Environment*, 514(0), 333-343. doi: 10.1016/j.scitotenv.2015.01.018
- ² Bain R, **Cronk R**, Hossain R., Bonjour S., Onda K., Wright J, Yang H, Slaymaker T, Hunter P, Prüss-Ustün A, Bartram, J. 2014. Global assessment of exposure to faecal contamination through drinking water based on a systematic review. *Tropical Medicine and International Health*, 19(8), 917-927. doi: 10.1111/tmi.12334. *According to Altmetric this paper is in the 99th percentile in terms of 'online attention' out of 2.3 million articles that it tracks; and was the second most highly commented paper in this journal.
- ¹ Bain R, **Cronk R**, Wright J, Yang H, Slaymaker T, Bartram J. 2014. Fecal contamination of drinking-water in low and middle-income countries: a systematic review and meta-analysis. *PLoS Medicine*. 11(5), e1001644. doi: 10.1371/journal.pmed.1001644

Peer-reviewed technical reports and book chapters

- ¹⁰ **Cronk R**. 2022. A review and compilation of tools, approaches, platforms, and networks for improving WASH in schools programming. Prepared for the Skat Foundation (Hands for Health Consortium).
- ⁹ U.S. Environmental Protection Agency (**Cronk R, co-author**). 2021. Proposed Approaches to the Derivation of a Draft Maximum Contaminant Level Goal for Perfluorooctanoic acid (PFOA) (CASRN 335-67-1) in Drinking Water. Office of Water (4304T), Health and Ecological Criteria Division, Washington, DC 20460. Available from the U.S. [EPA](#)
- ⁸ U.S. Environmental Protection Agency (**Cronk R, co-author**). 2021. Proposed Approaches to the Derivation of a Draft Maximum Contaminant Level Goal for Perfluorooctane sulfonic acid (PFOS) (CASRN 2795-39-3) in Drinking Water. Office of Water (4304T), Health and Ecological Criteria Division, Washington, DC 20460. Available from the U.S. [EPA](#)
- ⁷ Meier B, **Cronk R**, Luh J, de Albuquerque C, Bartram J. 2017. Monitoring the Progressive Realization of Human Rights to Water and Sanitation: Frontier Analysis as a Basis for Human Rights Accountability. In the *Oxford Handbook of Water Politics and Policy*. doi: 10.1093/oxfordhb/9780199335084.013.21
- ⁶ Shields K, **Cronk R**, Abebe L. 2017. Solomon Islands Rural Water, Sanitation and Hygiene Baseline Report. 2016. The Water Institute at UNC, Chapel Hill, NC, USA.
- ⁵ Fisher M, **Cronk R**, Fechter A, Kolsky P, Liang, K, Madsen E, George S. Edited by Fuente D, Bartram J. 2016. WaSH MEL Compendium of Best Practices and Lessons Learned. The Water Institute at UNC, Chapel Hill, NC, USA.
- ⁴ Fisher M, **Cronk R**, Shields K, Liang K. 2016. Assessment of the Conrad N. Hilton Foundation's Strategy for Sustainable Safe Water Access and Strategic Objectives: 2011-2015. The Water Institute at UNC, Chapel Hill, NC, USA.
- ³ **Cronk R**, Luh J, Meier B, Bartram J. 2015. The water, sanitation, and hygiene performance index: a comparison of country performance in realizing universal WaSH. The Water Institute at UNC: Chapel Hill, NC. doi: 10.13140/RG.2.1.2194.5763. Available from: <http://bit.ly/1RhieaX>.

² **Cronk R** and Bartram J. 2015. Water, Sanitation and Hygiene in Health Care Facilities: status in low and middle-income countries and way forward. World Health Organization, Geneva. Available from: <http://bit.ly/1O2CKKJ>.

¹ **Cronk R**, Drostin M, Perrin C, Wilkinson N, Gray K. 2013. An Assessment of Capacity and Resource Needs of North Carolina Watershed Programs. UNC Institute for the Environment: Chapel Hill, NC.

Peer-reviewed policy briefs

⁵ **Cronk R**, Guo A, Bartram J. 2019. Monitoring environmental health in maternal and newborn health programs in health care facilities. USAID: Maternal and Child Survival Program, Washington, D.C. Available from https://www.mcsprogram.org/resource/monitoring-environmental-health-in-maternal-and-newborn-health-programs-in-health-care-facilities/?_sfm_resource_topic=WASH

⁴ Guo A, **Cronk R**, Bartram J. 2019. Tools for improving quality of care for mothers and newborns: A review and gap analysis of critical environmental conditions. USAID: Maternal and Child Survival Program, Washington, D.C. Available from: https://www.mcsprogram.org/resource/tools-for-improving-quality-of-care-for-mothers-and-newborns-a-review-and-gap-analysis-of-critical-environmental-conditions/?_sfm_resource_topic=WASH

³ The Water Institute at UNC (**Cronk R, co-author**). Household, Water Point, School, and Healthcare Facility Evaluation Results for 14 countries. Prepared for the World Vision WaSH Program. Available from: <https://waterinstitute.unc.edu/projects/world-vision-14-country-evaluation>

**Lead Research scientist for the World Vision 14 country evaluation; four original, two-page briefing notes were produced for all 14 countries (56 briefs in total)*

² **Cronk R**. Edited by Brocklehurst C. 2018. Literature Review: The influence of seasonality on rural water services. The WaSH Policy Digest. The Water Institute at UNC, Chapel Hill, NC, USA. Available from: https://waterinstitute.unc.edu/files/2018/12/wash-policy-digest-10_120718.pdf

¹ **Cronk R**. Edited by Bartram J, Brocklehurst C. 2015. Literature Review: Water, sanitation, and hygiene in health care facilities. The WaSH Policy Digest. The Water Institute at UNC, Chapel Hill, NC, USA. Available from: <https://waterinstitute.unc.edu/files/2015/06/WPRD-Issue-2-Final.pdf>

Select Publications under review

Anderson D, Bartram J, Tantum L, Ambelu A, Ashinyo M, Kafanikhale H, **Cronk R**. With a new United Nations resolution on water, sanitation, hygiene, electricity, and waste in healthcare facilities, it's time for a logical framing and consistent vocabulary. Under review at *PLoS Sustainability and Transformation*.

Behnke N, Shackelford B, Dawood A, Oommen R, Tu R, Snel M, Anderson D, **Cronk R**, Bartram J. *Revise and resubmit*. The evolution of environmental health services in Azraq refugee camp, Jordan: a qualitative study. Under review at *Sustainability*.

Gregory A, Kelly E, Landa S, Muthike D, Samo J, Lopez J, Burrows G, McManus C, **Cronk R**. *Under review*. Practical uses of groundwater monitoring and modeling data in low-resource settings for WaSH researchers and practitioners. Under review in the *Journal of Water, Sanitation, and Hygiene*.

Lebu S, Kowalski C, Dalton J, Gyimah R, **Cronk R**, Salzberg A, Manga M. Resilience of sanitation systems under extreme rainfall and flooding conditions: a systematic review and evidence mapping. Under review at *Science of the Total Environment*.

Lineberger H, **Cronk R**, Kpodzro S, Salzberg A, Anderson D. *Under review*. Does WASH FIT improve water, sanitation, and hygiene and related health impacts in healthcare facilities? A systematic review. Under review at *Hygiene and Environmental Health Advances*.

McManus C, Diarra S, Lane K, **Cronk R**. *Under review*. Alternative indicators of handpump functionality: toward consistent performance-oriented monitoring. Under review at *PLoS Water*.

Tantum L, **Cronk R**, Asignwire N, Bohara P, Chetty L, Hirari M, Kpodzro S, Mavi T, Miller J, Ripkey C, Sharma S, Trinies V, Anderson D. *Under review*. What's next for costing WASH in healthcare facilities? Applying evidence for policy and practice. Under review in the *Journal of Water, Sanitation, and Hygiene*.

Select publications in preparation

Cronk R, Fleming L, Tracy W, Lebu S, Manga M, Tidwell B, Bartram J. *In revision*. The influence of intra-household sanitation use and toilet infrastructure quality on safely managed sanitation facilities. For resubmission to *Environmental Science: Water Research & Technology*.

Syed A, **Cronk R**, Salzberg A, Fisher M. Integrating Sanitary Inspection and Rainfall Data to Characterize Borehole Microbial Water Safety: A three-country study. For submission to *PLoS Water*.

Kpodzro S, **Cronk R**, Lineberger H, Tantum L, Salzberg A, Anderson D. Implementation and adaptation of WASH FIT in healthcare facilities: a systematic scoping review. For submission to *Hygiene and Environmental Health Advances*.

Fitzpatrick T, **Cronk R**, Mofolo I, Anderson D. The effects of environmental conditions on patient wellbeing and quality of care: a qualitative study in Malawi's public healthcare facilities. For submission to *Hygiene and Environmental Health Advances*.

Tantum L, Anderson D, **Cronk R**. Determinants of access to healthcare waste management services across 14 low- and middle-income countries. For submission to *Waste Management & Research*

Gregory A, Fisher M, Seidu Z, Smoke J, Anderson D, **Cronk R**, Bartram J. Water committee activities and characteristics affecting water system management in Northern Ghana. For submission to *ES&T Water*.

Sadler C, **Cronk R**, Anderson D. Global capacity for implementing WASH in healthcare facilities following the Eight Practical Steps. For submission to *World Development Perspectives*.

McManus C, Diarra S, Cronk R. Factors Related to Handpump Functionality and Performance: Evidence from nine sub-Saharan African countries. For submission to *PloS Sustainability and Transformation*

Cronk R, Lane K, Takane M, Jimenez A, Garriga R, Murad S, Bartram J. Measuring the means of implementation for participation in water and sanitation: indicators and data collection systems

Cronk R, Soet G, Bah M. Bayesian network models of factors influencing water service availability in Sierra Leone. For submission to *Environmental Science: Water Research & Technology*.

Select first-author peer-reviewed conference presentations

Cronk R. 2017. Identifying opportunities to improve piped water continuity in Honduras, Nicaragua, and Panama using Bayesian networks and regression. UNC Water and Health Conference. Chapel Hill, NC [presentation]

Cronk R, *et al.* 2015. How safe are improved drinking water sources in low- and middle-income countries? Evidence from systematic reviews. Water Microbiology Conference. Chapel Hill, NC [presentation]

Cronk R. 2013. An assessment of capacity and resource needs of North Carolina watershed programs. Water Resources Research Institute Annual Conference. 2013. Raleigh, NC [presentation]

Select side event and workshop presentations

Cronk R and Walker D. 2023. Scientific Writing and Publishing Workshop. UNC Water and Health Conference. Chapel Hill, NC, USA.

Cronk R and Denny L. 2019. Toward a research agenda for water, sanitation, and hygiene in healthcare facilities. UNC Water and Health Conference. Chapel Hill, NC, USA.

Cronk R. 2018. Fit-for-purpose partnerships in the SDG era. UNC Water and Health Conference. Chapel Hill, NC, USA.

Cronk R. 2015. Data fit-for-purpose: how does data lead to change in WaSH? UNC Water and Health Conference. Chapel Hill, NC, USA.

Cronk R. 2014. Measuring sustainability: exploring a systematic approach to define and quantify sustainable water services. UNC Water and Health Conference. Chapel Hill, NC, USA.

Cronk R. 2014. The water, sanitation, and hygiene performance index. Stockholm Water Week, workshop convened by the Conrad N. Hilton Foundation and the Water Institute at UNC. Stockholm, Sweden.

Invited presentations, lectures, teaching, and expert meetings

Water and health research communication (informal teaching of a course previously taught by ESE Profs. Bartram, MacDonald-Gibson, and Stewart). 2019-2020. 2023. Gillings School of Global Public Health, UNC.

PhD Student Research Intensive. Co-led by Cronk R, Zhu K, Anderson D, Manga M, Fisher M, Liang K. 2023. Gillings School of Global Public Health, UNC.

Cronk R. 2013 - 2019. WaSH in non-household settings. Lectures in ENVR 682: WaSH & Global Health, UNC.

Cronk R. 2018. Using monitoring data and systems analysis approaches to improve rural water service delivery in low- and middle-income countries. Mortenson Center for Engineering in Developing Communities, University of Colorado-Boulder.

Expert group meeting for Sustainable Development Goal (SDG) monitoring of WaSH in schools. *Rapporteur*. 2016. Coordinated by UNICEF. New York, NY, USA.

Cronk R. 2016. Methodological challenges with health care facility surveys. *Presenter and rapporteur*. Expert group meeting for SDG monitoring of WaSH in Health Care Facilities. Coordinated by WHO and UNICEF. New York, NY, USA.

Cronk R. 2016. WaSH and environmental conditions in health care facilities. *Presenter and rapporteur*. Meeting on water, sanitation, and hygiene (WASH) in health care facilities: technical research workshop and strategic review of global activities. Coordinated by the World Health Organization and the London School of Hygiene and Tropical Medicine. London, UK.

Cronk R. 2015. The status of water, sanitation, hygiene, and infection control in health care facilities. *Presenter*. Meeting on Water, Sanitation and Hygiene in Health Care Facilities – Urgent Needs and Action. Coordinated by the World Health Organization and UNICEF. Geneva, Switzerland.

Cronk R and Downs K. 2015. Systematic literature reviews for water, sanitation, policy and health. Lecture in ENVR 785: Water Policy in Lesser-Developed Countries (Dale Whittington). UNC Chapel Hill.

Cronk R and Venkataramanan V. 2014. Systematic Literature Reviews for Water and Health. Lecture in ENVR 683: Water-Health Research, UNC Chapel Hill.

Cronk R. 2014. Health and educational outcomes from WaSH in schools. Meeting on advancing water, sanitation, and hygiene in schools, coordinated by the World Health Organization Regional Office for Europe. Bonn, Germany.

Cronk R. 2014. International monitoring of drinking water, sanitation, and hygiene: beyond provision. 6th International Water & Health Seminar hosted by Suez Environment. Cannes, France.

Cronk R. 2014. The status of WaSH and environmental conditions in health care facilities. *Presenter and rapporteur*. International strategic meeting on improving access to water, sanitation, and hygiene in health care facilities, coordinated by the World Health Organization, UNICEF, and the Spanish Ministry of Health. Madrid, Spain.

Select awards

Silver Award, You Matter at ICF	<i>Aug 2021</i>
<i>One of three silver awards given in 2021 in the 100+ person Health Science Practice at ICF for demonstrating ICF's core values and professional excellence</i>	
Finalist, Postdoctoral Award for Research Excellence (PARE) at UNC	<i>Aug 2019</i>
<i>Identified as one of the top 15 (top ~1%) postdoctoral research scholars at UNC</i>	
Best of UNICEF Research, 2015	<i>Sept 2015</i>
<i>For Bain et al. (2014) published in PLoS Medicine</i>	
Graduate Student Mentoring Award	<i>Apr 2014 and Sept 2014</i>
<i>For UNC graduate students who support, mentor, and motivate undergraduate student researchers</i>	
EPA P3 Honorable Mention	<i>June 2013</i>
<i>Selected by the American Association for the Advancement of Science (AAAS), for UNC's EPA P3 project presented at the National Sustainable Design Expo in Washington, DC</i>	
Department of Environmental Sciences & Engineering Student Achievement Award	<i>Apr 2013</i>

The ESE Achievement Award recognizes an outstanding Master's graduate in the department based on the student's academic excellence and professional promise

UVA Undergraduate Research and Design Symposium Finalist

Apr 2009

Selected as one of the five best undergraduate research projects from the School of Engineering at UVA

Select fellowships

National Institute of Environmental Health Sciences Biostatistics Training Fellowship, \$65,800 Aug 2015 – Aug 2017
UNC Public Health Informatics Fellowship, \$10,000 June 2012

Select grant proposals written and funded (only listed if led effort or major contributor)

Advancing WASH in Healthcare facilities, \$50,000 Aug 2023 – Mar 2024

Sponsor: World Vision

WASH in HCF Community of Practice, \$40,000 July 2023 – Jun 2024

Sponsor: Wallace Genetic Foundation

Advancing global efforts to achieve universal access to WASH in HCFs, \$70,000 July 2023 – Jun 2024

Sponsor: Wallace Genetic Foundation

The costs and sustainability of essential environmental conditions in HCFs, \$80,000 Jan 2020 – Dec 2020

Sponsor: P&G Children's Safe Drinking Water Program

A systematic review of effective surface disinfectants for health care settings, \$33,000 July 2019 – July 2020

Sponsor: Kersia Group

Assessing the Existence of Water, Sanitation, Hygiene and Infection Prevention Indicators within Quality of Care Assessment and Implementation Tools for Maternal and Newborn Health, \$30,000 July 2019 – Sept 2019

Sponsor: USAID (Maternal and Child Survival Program through Save the Children)

Improving water point performance in rural Uganda, \$16,000 Feb 2019 – June 2019

Sponsor: North Carolina State University (through Prof. Raymond Guiteras)

Communicating and disseminating costs of WASH in healthcare facilities research, \$50,000 Sept 2019 – Aug 2020

Sponsor: Wallace Genetic Foundation

Implementation research to improve environmental conditions in HCFs in Malawi, \$120,000 Jan 2019 – Jan 2020

Sponsor: P&G Children's Safe Drinking Water Program

Understanding the costs of WaSH and environmental conditions in HCFs, \$50,000 October 2017 – October 2018

Sponsor: Wallace Genetic Foundation

Mechanisms for sustainability: post-construction support for rural water supply, \$50,000 July 2015 – June 2016

Sponsor: Wallace Genetic Foundation

Processes for Sustainability in Community-Managed Water Supply Systems, \$95,774 Mar 2015 – June 2016

Sponsor: World Vision

Report on the Status of WaSH and Environmental Conditions in Health Care Facilities, \$7,910 Nov 2013 – Mar 2014

Sponsor: World Health Organization

Journal Manuscripts and Report on Global Water Quality by Type, Source, and Region, \$6,848 Oct 2013 – Nov 2014

Sponsor: World Health Organization

A Decision-Making Support Tool for Water and Sanitation, \$15,000 Sept 2012 – Sept 2013

Sponsor: United States Environmental Protection Agency

Professional service

World Health Organization WaSH in health care facilities monitoring and research task team Jun 2015 – April 2020

Journal peer reviewer and editorial services

Nov 2013 – present

American Journal of Tropical Medicine and Hygiene, Bulletin of the World Health Organization, BMJ Global Health, Exposure and Health, ES&T Water, Health Policy and Planning, Health Security, International Journal of Hygiene and Environmental Health, International Journal of Environmental Research and Public Health, Journal of Cleaner Production, Journal of Water and Health, Journal of Water, Sanitation, and Hygiene for Development, PLoS One, Public Health, Public Health Reports, Science of the Total Environment, Tropical Medicine and International Health, Water, Water Policy, World Development, World Development Perspectives*

*Guest Editor, *International Journal of Environmental Research and Public Health Special Issue, "Solutions for Improving Essential Environmental Conditions in Healthcare Facilities in Low- and Middle-Income Countries"* (2021)

Synthesis Coach for the UNC Robertson Scholar Synthesis Summer Project

May 2013 – Aug 2013

PhD committees

- Lucy Tantum, Ph.D. Environmental Sciences and Engineering *Apr 2024 – present*
- Sarah Lebu, Ph.D. Environmental Sciences and Engineering *Aug 2023 - present*
- Catherine McManus, Ph.D. Environmental Sciences and Engineering *Aug 2023 - present*

MPH committees

- David Bodden, MPH Environmental Health Solutions *Spring 2024*
- Tara Fitzpatrick, MPH Environmental Health Solutions *Spring 2024*
- Hannah Lineberger, MPH Global Health *Spring 2024*
- Sena Kpodzro, MPH Global Health *Spring 2024*
- Caralee Sadler, MPH Place-Based Health (Second reader) *Spring 2024*

Practicum students (co-preceptor)

- Anushka Banerjee, MPH Global Health *Summer 2023*
- Doreen Kaphalanya, MPH Global Health *Summer 2023*
- Caralee Sadler, MPH Place-Based Health *Summer 2023*
- Montana Scott, MPH Environmental Health Solutions *Summer 2023*
- Brooklyn Story, MPH Environmental Health Solutions *Summer 2023*

Graduate student mentoring (for research credit)

Undergraduate student mentoring (for research credit)

Graduate student mentoring (as a graduate student and post-doc)

Sept 2013 – May 2020

- Catherine McManus, M.S. City and Regional Planning '20 (Sept 2019 – April 2020)
- Hayley Schram, M.S. Environmental Sciences & Engineering '20 (Jan 2019 – April 2020)+*
- Darcy Anderson, Ph.D. Environmental Sciences & Engineering (Aug 2017 – April 2020)+*
- Hemali Oza, M.S. Environmental Sciences & Engineering '19 (Aug 2018 – Dec 2019)+
- Brandie Banner, M.S. Environmental Sciences & Engineering '19 (Aug 2017 – May 2019)+*
- Ghanja O'Flaherty, M.S. Environmental Sciences & Engineering '19 (Aug 2017 – May 2019)+*
- Emma Kelly, M.S. Environmental Sciences & Engineering '19 (Aug 2017 – May 2019)+*
- Amy Guo, M.S. Environmental Sciences & Engineering '18 (Aug 2017 – May 2018)+*
- Kiersten Miner M.P.H. Maternal and Child Health '19 (Aug 2017 – Jan 2018)
- Nikki Behnke, M.S.P.H. Environmental Sciences & Engineering '19 (Aug 2017 – May 2019)+*
- Tori Klug, M.S. Environmental Sciences & Engineering '16 (Aug 2014 – Aug 2016)+*
- Caroline Kostyla, M.S. Environmental Sciences & Engineering '14 (Sept 2013 – May 2014)+

Undergraduate research advising (as a graduate student and post-doc)

Sept 2012 - present

- Emily Pak, B.S.P.H. Health Policy and Planning '20 (Jan 2019 – April 2020)*
- Donald Fejfar B.S.P.H. Biostatistics '21 (Oct 2017 – April 2020)+*
- Rachel Beardsley, B.S. Public Policy '20 (Oct 2017 – April 2020)+
- Annie Oomen, B.A. Global Studies '20 (Aug 2017 – April 2020)*
- Raymond Tu, B.S.P.H. Environmental Health Science '21 (Aug 2017 – April 2020)*
- Caroline Folz, B.S. Public Policy '18 (Sept 2017 – Aug 2018)*
- Frances Reuland, B.S. Environmental Sciences '18 (Aug 2017 – Aug 2018)+*
- Ryan McCord, B.S. Public Policy '18 (Aug 2017 – May 2019) +*
- Sarah Dancausse, B.S.P.H. Health Policy and Management '20 (Aug 2017 – May 2018)*
- Elissa Scherer, B.A. Global Studies '19 (Aug 2017 – May 2019)*
- Mabel D'Souza, B.S.P.H. Health Policy and Management '20 (Aug 2017 – May 2019)*
- Brittany Cooper, B.S.P.H. Environmental Health Science '19 (Aug 2017 – May 2019)+*
- Wilson Guo, B.S.P.H. Health Policy and Management '19 (Sept 2016 – present)+*
- Michelle Moffa, Civil and Environmental Engineering (Duke University) '18 (Sept 2016 – present)+*
- Kristen Michelle Lee, B.S. City and Regional Planning '18 (Jan 2015 – May 2016)*
- Nikki Benkhe, B.A. Peace, War and Defense '16 (Jan 2015 – May 2016)+*
- Leah Everist, B.S.P.H. Health Policy and Management '18 (Jan 2015 – Aug 2015)*
- Emma Kelly, B.S.P.H. Environmental Health Science '17 (Sept 2014 – present)+*
- Andrew (A.J.) Karon, B.S.P.H. Environmental Health Science '14 (Jan 2014 – May 2015)+*
- Mimi Caddell, B.A. Environment Studies '14 (Nov 2013 – July 2014)
- Garrison Gordon, B.S.P.H. Environmental Health Science '15 (Aug 2013 – present)

- Stefanie Schwemlein, B.S.P.H. Environmental Health Science '14, UNC (Sept 2012 – June 2014)+
- Jordan Deuink, B.S.P.H. Health Policy and Management '14, UNC (Sept 2012 – Aug 2013)

+ Denotes student published a first author paper under RDC mentorship (or in peer review)

* Denotes student co-authored a publication under RDC mentorship (or in peer review)

UNICEF WaSH in Schools Partnership Network and post-2015 working group

Sept 2012 – present

Other work experience

World Vision International , Tamale, Ghana. <i>Graduate Research Intern</i>	<i>June 2012 – Aug 2012</i>
Lab for Applied Informatics Research (LAIR) , Chapel Hill, NC. <i>Research Assistant</i>	<i>Sept 2011 – Apr 2013</i>
US Navy - Pacific Partnership 2009 (PP09) , <i>Engineering Volunteer</i>	<i>June 2009 – Sept 2009</i>
Booz Allen Hamilton , Arlington, VA. <i>Management Consulting Intern</i>	<i>June 2008 – Aug 2008</i>
UVA Engineering in Context (EIC): UVA-Guatemala Initiative , <i>Project Lead</i>	<i>Apr 2008 – May 2009</i>

Skill set

General: Bayesian network modeling, database management, decision analysis, information visualization, knowledge management, life cycle costing, monitoring and evaluation, needs assessments, policy analysis, project management, qualitative research methods, risk assessment, statistical modeling (regression, multi-level modeling), survey design and administration, scoping review, systematic review, systems analysis

Software proficiency: Adobe Illustrator, ArcGIS, Dedoose (qualitative data analysis), Microsoft Office suite (Access, Excel, Outlook, PowerPoint, Project, Word, Teams), Netica (Bayesian network modeling), Qualtrics (surveys), R, Stata

Systematic review tools: Distiller, EndNote, Health Assessment Workplace Collaborative (HAWC), Litstream, Mendeley, Swift Active

Graduate Level Coursework (M.S. and Ph.D.): Advanced Regression Modelling, Biostatistics, Ecological Microbiology, Environmental Decision Analysis, Epidemiology, Global Health Perspectives, Introduction to Public Health, Limnology, Public Health Informatics, Statistics for Social Scientists, Surface Water Quality Modeling, Survey Computing, Survey Sampling, Temporal GIS, Unifying Concepts for Environmental Sciences & Engineering, WaSH & Global Health, Water Resource Systems, Water and Health Research Methods I & II, Writing for WaSH Publication

Post-graduate training:

- 2017. Continuous Quality Improvement for WaSH in developing countries, taught by the Public Health Leadership Program at UNC-Chapel Hill.
- 2017. Quantitative Microbial Risk Assessment Interdisciplinary Instructional Institute (QMRA III 2017), funded by the National Institutes of Health (NIH) and the Center for Advancing Microbial Risk Assessment (CAMRA)

International experience

Fieldwork: Ghana, Guatemala, India, Kiribati, Marshall Islands, Nicaragua, Samoa, Solomon Islands, Tanzania, Tonga

Other country experience: Austria, Belgium, Bosnia & Herzegovina, Chile, Costa Rica, Croatia, Dominica, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, New Caledonia (Fr.), Poland, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom