# Siddhartha Roy PhD, EIT

***Environmental Engineer/Research Scientist***

a: 1145 Perry St., Room #408, Blacksburg, VA 24061 USA

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## EXPERTISE SUMMARY

Siddhartha Roy is an environmental engineer with 8+ years of research, engineering, and consulting experience in the areas of drinking water (chemistry, treatment, & infrastructure), public health (WASH, contamination, citizen monitoring, & biokinetic modeling), and environmental justice. He and his team's scientific and humanitarian relief work, with residents of Flint Mich., helped uncover the Flint Water Crisis.

## ACADEMIC HISTORY AND LICENSES

**Virginia Tech**, College of Engineering – Blacksburg, VA

2018 *Ph.D. in Civil Engineering (Environmental & Water Resources Engineering), Grad Student of the Year*

2015 *M.S. in Environmental Engineering, "Water INTERface" IGEP Fellow*

**Nirma University**, Institute of Technology – Ahmedabad, India

2010 *B.Tech. in Chemical Engineering, First Class with Distinction*

**State of Virginia**, Engineer in Training (EIT)

2020 *Environmental Engineering License #0420072931*

## WORK AND RESEARCH EXPERIENCE

2012+ **Virginia Tech Department of Civil and Environmental Engineering** – Blacksburg, VA

*Research Scientist (10/2020 onwards)*
*Postdoctoral Research Associate, US Water Study Team (2018-20)*
*Student Leader and Communications Director, Flint Water Study Team of 40+ members (2015-18)*
*Graduate Research and Teaching Assistant, Laboratory of Dr. Marc Edwards (2013-18)*
*Head Grant Writer and Researcher, Guatemala project, Engineers Without Borders USA (2013-15)*

- Project Manager for multiple research projects focused on waterborne lead (Pb), water infrastructure corrosion, citizen science, modeling, WASH, and perverse incentives in academia.
- Mentor to 11 advisees (past + present) in conducting research, publishing, and winning awards.
- We used citizen science, open data sharing, field sampling, lab experiments, investigative journalism and social media to expose the Flint, MI Water Crisis (2014-15). Our efforts led to declaration of a national "Public Health Emergency" by President Barack Obama, garnered over $1.2 billion in relief for Flint residents, and informed a debate on "safe" water in America.
- Used lead in sewage and children's blood datasets to estimate timing and magnitude of water lead levels during the Flint Water Crisis and ran bio-kinetic models to estimate fetal deaths.
- Led water sampling campaigns in 300+ homes in Chicago, IL and 3 suburbs; these datasets revealed harmful and persistent lead in drinking water issues (*Chicago Tribune* front page)
- Contributed to the engineering design of and raised $26,450 from Boeing, Bechtel, Pratt & Whitney, and crowdfunding to sponsor a septic tank system for a Guatemalan boarding school.
- Funded grants: $10K = EPA, $16.2K = Chase Brass, $60K = Water Res Fdn, $100K+ = crowd
- *PhD Dissertation:* Interplay of water chemistry and entrained particulates in erosion corrosion of copper and nonleaded alloys in potable water systems
- *Coursework:* Water and Wastewater Treatment, Aquatic Chemistry, Environmental Statistics, Environmental Microbiology, Env. Engineering Principles, Public Health Fundamentals, Ethics, Electrochemistry/Corrosion, Water Resources Policy & Economics, Politics of Developing Areas

2010-12 **Cognizant Technology Solutions**, Merck Europe, Middle East & Africa Project – Pune, India

*Programmer Analyst (Business Intelligence and Data Analytics), Innovation Lead*

## HONORS/AWARDS

2019 New Face of Civil Engineering Professionals, American Society of Civil Engineers

2017 Rising Stars of the Water Industry, WQP Magazine

2016 Graduate Student Service Excellence Award, Virginia Tech

2015 Water Is Life Award, American Civil Liberties Union Michigan

2014 Engineers Without Borders-USA Global Leadership Program Scholarship, Black and Veatch Fndn

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## SKILLS

**General:** project planning and management, technical writing, budgeting, fundraising, leadership, mentoring, client communication, public speaking, outreach

**Scientific:** experimental design, hypothesis-driven research, interdisciplinary collaborations, surveys, bench-scale experimentation, laboratory probes, spectrophotometers, sample characterization

**Statistics software (qualitative and quantitative):** R, Excel, SPSS Statistics, Qualtrics, QDA Miner

**Programming languages:** WordPress, HTML, C, C++, Pascal, SQL

**Languages:** English, Hindi, Bengali, Gujarati

## PEER-REVIEWED SCHOLARSHIP

*Total peer-reviewed publications = 13 (9 as first author); Citations = 435; H-index=7 (Google Scholar); Conference presentations = 21; Technical reports = 3; Articles under review/preparation = 5*

1. **Roy, S.** and M.A. Edwards. Efficacy of Corrosion Control and Pipe Replacement in Reducing Citywide Lead Exposure during the Flint Water System Recovery. **ES: Water Research & Tech.** doi: 10.1039/d0ew00583e
2. **Roy, S.**, Tang, M. and M.A. Edwards. Lead Release to Potable Water during the Flint, Michigan Water Crisis as revealed by Routine Biosolids Monitoring Data. **Water Research.** doi: 10.1016/j.watres.2019.05.091
3. **Roy, S.** and M.A. Edwards. Citizen Science During the Flint, Michigan Federal Water Emergency: Ethical Dilemmas and Lessons Learned. **Citizen Science: Theory and Practice.** doi:10.5334/cstp.154
4. **Roy, S.** and M.A. Edwards. Interactive Effects of Water Chemistry, Hydrodynamics, and Precipitated Calcium Carbonate Causing Erosion Corrosion of Copper in Hot Water Recirculation Systems: Case Study and Experimental Work. **CORROSION.** doi:10.5006/2937
5. **Roy, S.,** J.M. Coyne, J.A. Novak, and M.A. Edwards. Flow-induced failure mechanisms of copper pipe in potable water systems. **Corrosion Reviews**. doi:10.1515/corrrev-2017-0120
6. Edwards, M.A. and **S. Roy.** Academic Research in the 21st Century: Maintaining Scientific Integrity in a Climate of Perverse Incentives and Hyper-competition. **Environ Eng Sci.** doi:10.1089/ees.2016.0223.
7. **Roy, S.,** K. Phetxumphou, A.M. Dietrich … W. You, B.M. Davy. An Evaluation of the Readability of Drinking Water Quality Reports: A National Assessment. **Journal of Water and Health**, doi:10.2166/wh.2015.194

## PUBLIC UNDERSTANDING OF SCIENCE

- *TED Talk*: Science in service to the public good (https://go.ted.com/Cyoj), over 1 million views
- *Documentaries featured in:* PBS NOVA 'Poisoned Water' (on Netflix; Kavli award), Virginia Tech 'Cicero'
- *Media coverage (60+):* ABC News, BBC, Chicago Tribune, Mother Jones, National Science Foundation, NPR stations, Sky News UK, Story Collider, The Guardian, The New York Times, WIRED
- *Talks given (60+):* MIT, Northwestern, Princeton, World Health Organization, Middlebury, Wesleyan, Tufts, Harvard, Notre Dame, Phillips Exeter Academy, University of Maryland, Slovenian Academy of Sciences & Arts, WGBH Idea Lab, Science Museum of Virginia, TCA Hollywood Press Tour, European Union conf.
- *Articles authored in:* CNN, American Scientist, Aeon Magazine, OpFlow, Scientific American
- *Research/data websites curated:* www.uswaterstudy.org, www.flintwaterstudy.org (1M+ visits)
- *Producer:* The Public-inspired Science Podcast (on iTunes), US Water Study documentary series (ongoing), water sampling instruction videos for Flint, MI and California schools, MacArthur Foundation grant video pitch.

## TEACHING AND SERVICE

- *Organizer:* "Responding to the coronavirus pandemic: Environmental Engineering approaches" webinar (2020)
- *Co-organizer:* US-Jordan forced displacement/Syrian refugee crisis conference session on water (2019)
- *Instructor:* Five courses for water treatment plant operators sponsored by Virginia Dept. of Health (2018-20)
- *Teaching Assistant/Co-teacher:* 'Engineering Ethics and the Public' graduate-level course (2014-19)
- *Tutor:* Math and Science – 4th Grade, Kipps Elementary, Blacksburg Refugee Partnership, 2018
- *Awards Reviewer:* AAAS Kavli Science Journalism (2020), AAAS IF/THEN Ambassadors (2019), Graduate Women in Science National Fellowship Program (2019), VT Graduate Research Development Program (2013)
- *Expert Judge:* Virginia State Science and Engineering Fair (2020), U.S. Stockholm Junior Water Prize (2018)
- *Moderator,* Heterodox Environmental Engineering and Science (HxEES) Community (2020-present)
- *Referee:* PNAS, Env Sci. & Tech., Env. Engg. Sci., CORROSION, J. Water & Health, Util. Policy
- *Memberships:* ASCE, AEESP, AWWA, EWB-USA, HxA, NACE, SID-W, WEF.