JESSICA R. RAY

Curriculum Vitæ

Civil & Environmental Engineering
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EDUCATIONAL HISTORY

University of California, Berkeley, Berkeley, CA
Miller Institute Postdoctoral Fellow, Civil & Environmental Engineering
December 2018

Washington University in St. Louis, St. Louis, MO
Ph.D., Energy, Environmental & Chemical Engineering
June 2015
Interactions, Fate and Transport of Natural and Engineered Oxide Nanoparticles in Wastewater and Colloids in Water Treatment Systems

Washington University in St. Louis, St. Louis, MO
M.S., Energy, Environmental & Chemical Engineering
October 2012
Understanding the Fate and Transport of Natural and Engineered Oxide and Carbonate Nanoparticles in Water and Wastewater Treatment Systems

Washington University in St. Louis, St. Louis, MO
B.S., Chemical Engineering
May 2009

EMPLOYMENT HISTORY

University of Washington
Seattle, WA, USA
Assistant Professor, 2019 – present

University of California, Berkeley, Miller Institute for Basic Research
Berkeley, CA, USA
Postdoctoral Fellow, 2015 – 2018

Washington University in St. Louis
St. Louis, MO, USA
Graduate Research Assistant, 2009 – 2015

AWARDS AND HONORS

CAREER Award, May 2022, National Science Foundation Division of Chemical, Biological, Bioengineering, Environmental and Transport Systems (CBET); Environmental Engineering Program; $500K

Justice, Equity, Diversity and Inclusion Award, June 2021, University of Washington, Civil & Environmental Engineering

Robert O. and Irene V. Sylvester Family Endowed Professorship in Water Resources: Environmental Engineering, 2021–2026, University of Washington, Civil & Environmental Engineering; $100K

"1,000 Inspiring Black Scientists in America", December 2020, Cell Mentor

Rogel Faculty Support Award, July 2020, University of Washington, Civil & Environmental Engineering; $10.4K

Talented 12 Class of 2020, April 2020, American Chemical Society, Chemical & Engineering News

Miller Institute for Basic Research Postdoctoral Fellowship, 2015–2018, University of California, Berkeley; $85K

Science to Achieve Results (STAR) Graduate Fellowship, 2012–2015, Environmental Protection Agency; $132K

Graduate STEM Fellows in K-12 (GK-12) Fellowship, 2009–2010, National Science Foundation; $40.5K

AFFILIATIONS AND OTHER APPOINTMENTS

Adjunct Professor, Chemical Engineering (University of Washington, 2021 – present)

PUBLICATIONS

Superscript legend: 1: my postdoc, 2: my graduate student, 3: my undergraduate student, §: co-authorship; *: co-corresponding author; #: corresponding author

h-index: 17 i10-index: 18 Total citations: 1074 UW citations: 652

Accepted/In Preparation/Under Review

1. Aishwarya Das, Fanny E.K. Okaikue-Woodi[2], Timothy F.M. Rodgers, Jessica R. Ray and Rachel C. Scholes[#], "Iron-based reactive soil amendments for the treatment of stormwater-derived trace organic contaminants in bioretention systems", *under review*.
2. Reagan A. Beers[2], Dijia Bao[3] and Jessica R. Ray[#], "Chemical intercalant affects the structural properties and aqueous stability of V_2CT_x MXene," *under review*.
3. Fanny E.K. Okaikue-Woodi[2], Reagan A. Beers[2], Reyna Morales Lumagui[3], Amy M. Quintanilla[2] and Jessica R. Ray[#], "Effects of effluent organic matter on ferrate (Fe(VI))-coated sand reactivity in synthetic wastewater effluent", *under review*.
4. Maureen Kinyua, Ebony O. McGee, Jacelyn Rice-Boayue, William A. Tarpeh and Jessica R. Ray[#], "Beyond recruitment: What is meaningful representation for early career Black Environmental Engineering faculty?", *under review*.
5. Jessica M. Steigerwald[2] and Jessica R. Ray[#], "Immobilization of a multi-template imprinted polymer on biochar for adsorption of short- and long-chain per- and polyfluoroalkyl substances," *under review* (**Invited submission to *Nature: Water***).
6. Nicole Redden[2,§], Jessica M. Steigerwald[2,§], Fanny E.K. Okaikue-Woodie[2,§], Joshua Chong[3] and Jessica R. Ray[#], "Treatment of trace organics in urban stormwater by biochar derived from spent coffee grounds," *under preparation*.
7. Alanna Hildebrandt[2], Ximin Hu, Hailey Germeau, Melissa Gonzalez, Theo Yih[3], Craig Rideout, Jessica R. Ray[*] and Edward P. Kolodziej[*], "Evaluation of 6PPD-quinone sorption

onto natural and engineered stormwater sorbents", *under preparation*.

8. Jennifer Hooper[2], Jessica R. Ray[*] and Michael C. Dodd[*], "Critical review of natural photochemically-generated reactive reducing species in microheterogeneous environments and their potential importance for contaminant degradation", *under preparation*.
9. Amy M. Quintanilla[2], Korena Mafune, Dijia Bao[3], Mari K.H Winkler and Jessica R. Ray[#], "Fungus-inoculated biochar as a low-cost media for stormwater treatment," *under preparation*.
10. Yuemei Ye[1,§,*], Jessica M. Steigerwald[2,§], Vivian Jones[3] and Jessica R. Ray[*], "Hydrogels for selective removal and degradation of per- and polyfluoroalkyl substances (PFAS) in water: A critical review", *under preparation*.

Published

1. Michael S. Wong[#], Jessica R. Ray and Steven L. Suib, "Advancing Materials for Environmental Remediation and Human Health Protection," *ACS ES&T Engineering (IF: 7.5)*, **2024**, 4, 4, 758-760, DOI: https://doi.org/10.1021/acsestengg.4c00136; number of citations: 1 (Google Scholar) (**Invited Submission with Editorial Advisory Board members**).
2. Fanny E. K. Okaikue-Woodi[2], Reyna Morales Lumagui[3] and Jessica R. Ray[#], "Simultaneous oxidation of trace organics and sorption of trace metals by ferrate (Fe(VI))-coated sand in wastewater effluents," *ACS Environmental Au (IF: 6.7)*, **2024**, 4, 5, 260-270, DOI: https://doi.org/10.1021/acsenvironau.4c00024; number of citations: 1 (Google Scholar) (**Invited Submission to *ACS Environmental Au* Emerging Investigator Series**)
3. Fanny Okaikue-Woodie[2] and Jessica R. Ray[#], "Synthesis of ferrate (Fe(VI))-coated sand for stabilized reactivity and enhanced treatment of phenol" *Journal of Materials Chemistry A (IF: 10.7)*, **2023**, 11, 13552-13563, DOI: https://doi.org/10.1039/D3TA01950K; number of citations: 3 (Google Scholar).
4. Yuemei Ye[1], Hojeong Bang[3], Vivian Jones[3], Kaylie Dennehy[3], Jessica M. Steigerwald[2] and Jessica R. Ray[#], "H_2O_2-catalyzed defluorination of perfluorooctanesulfonate (PFOS) by oxidized vanadium carbide MXene nanosheets" *Journal of Materials Chemistry A (IF: 10.7)*, **2023**, 11, 16803-16814, DOI: https://doi.org/10.1039/D3TA02073H; number of citations: 2 (Google Scholar).
5. Jessica M. Steigerwald[2], Shawnie Peng[3] and Jessica R. Ray[#], "Novel perfluorooctanesulfonate-imprinted polymer immobilized on spent coffee grounds biochar for selective removal of perfluoroalkyl acids in synthetic wastewater" *ACS ES&T Engineering (IF: 7.5)*, **2023**, 3, 4, 520-532, DOI: https://doi.org/10.1021/acsestengg.2c00336; number of citations: 24 (Google Scholar).
6. Katya Cherukumilli[1], Max Steiner[3] and Jessica R. Ray[#], "Effective fluoride removal using granular bauxite filter media as an affordable and sustainable alternative to activated alumina" *Environmental Science: Water Research & Technology (IF: 3.5)*, **2021**, DOI: https://doi.org/10.1039/D1EW00033K; number of citations: 7 (Google Scholar).
7. Jessica M. Steigerwald[2] and Jessica R. Ray[#], "Adsorption behavior of perfluorooctanesulfonate (PFOS) onto activated spent coffee grounds in synthetic wastewater effluent" *Journal of Hazardous Materials Letters (IF: 6.6)*, **2021**, 2, 100025-100032, DOI: https://doi.org/10.1016/j.hazl.2021.100025 (**invited submission**); number of citations: 58 (Google Scholar).
8. Chelsea W. Neil, Xuanhao Wu, Doyoon Kim, Haesung Jung, Yanzhe Zhu, Jessica R. Ray

and Young-Shin Jun[#], "Arsenite oxyanions affect CeO_2 nanoparticle dissolution and colloidal stability" *Environmental Science: Nano (IF: 5.8)*, **2021**, 8, 233-244. DOI: https://doi.org/10.1039/D0EN00970A; number of citations: 9 (Google Scholar)

9. Fanny E. K. Okaikue-Woodi[2], Katya Cherukumilli[1] and Jessica R. Ray[#], "A critical review of contaminant removal by conventional and emerging media for urban stormwater treatment" *Water Research (IF: 11.5)*, **2020**, 187, 116434-116455, DOI: https://doi.org/10.1016/j.watres.2020.116434; number of citations: 95 (Google Scholar)
10. Jessica R. Ray, Xuanhao Wu, Chelsea W. Neil, Haesung Jung, Zhichao Li and Young-shin Jun[#], "Redox chemistry of CeO_2 nanoparticles in aquatic systems containing Cr(VI)(aq) and Fe^{2+} ions" *Environmental Science: Nano (IF: 5.8)*, **2019**, 6, 2269-2280. DOI: https://doi.org/10.1039/C9EN00201D; number of citations: 15 (Google Scholar)
11. Jessica R. Ray, Itamar A. Shabtai, Marc Teixidó, Yael G. Mishael, and David L. Sedlak[#], "Polymer-clay composite geomedia for sorptive removal of trace organic compounds and metals in urban stormwater" *Water Research (IF: 11.5)*, **2019**, 157, 454-462. DOI: https://doi.org/10.1016/j.watres.2019.03.097; number of citations: 93 (Google Scholar)
12. Vivek B. Shah, Chloe Ferris, Gregory S. Orf, Shalinee Kavadiya, Jessica R. Ray, Young-shin Jun, Byeongdu Lee, Robert E. Blankenship and Pratim Biswas[#], "Supramolecular self-assembly of *Bacteriochlorophyll c*. molecules in aerosolized droplets to synthesize biomimetic chlorosomes" *Journal of Photochemistry and Photobiology B: Biology (IF: 3.9)*, **2018**, 185, 161-168. DOI: https://doi.org/10.1016/j.jphotobiol.2018.04.032; number of citations: 8 (Google Scholar)
13. Jessica R. Ray, Whitney Wong, and Young-shin Jun[#], "Antiscaling efficiency of $CaCO_3$ and $CaSO_4$ on polyethylene glycol (PEG)-modified reverse osmosis membranes in the presence of humic acid: Interplay of membrane surface properties and water chemistry" *Physical Chemistry Chemical Physics (IF: 3.7)*, **2017**, 19 (7), 5647-5657, DOI: https://doi.org/10.1039/C6CP08569E; number of citations: 50 (Google Scholar).
14. Chelsea W. Neil, Jessica R. Ray, Byeondgu Lee, and Young-Shin Jun[#], "Fractal aggregation and disaggregation of newly formed iron(III) (hydr)oxide nanoparticles in the presence of natural organic matter" *Environmental Science: Nano (IF: 5.8)*, **2016**, 3 (3), 647-656, DOI: https://doi.org/10.1039/C5EN00283D; number of citations: 30 (Google Scholar).
15. Jessica R. Ray,[§] Sirimuvva Tadepalli,[§] Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie Tang, Srikanth Singamaneni, and Young-Shin Jun[#], "Hydrophilic, bactericidal nanoheater-enabled reverse osmosis membranes to improve fouling resistance" *ACS Applied Materials & Interfaces (IF: 8.5)*, **2015**, 7 (21), 11117-11126, DOI: https://doi.org/10.1021/am509174j; number of citations: 86 (Google Scholar).
16. Xuyang Liu,[§] Jessica R. Ray,[§] Chelsea W. Neil,[§] Qingyun Li, and Young-Shin Jun[#], "Enhanced colloidal stability of CeO_2 nanoparticles by ferrous ions: Adsorption, redox reaction, and surface precipitation" *Environmental Science & Technology (IF: 11.7)*, **2015**, 49 (9), 5476- 5483, DOI: https://doi.org/10.1021/es506363x; number of citations: 42 (Google Scholar).
17. Jiaxi Fang, Yang Wang, Michel Attoui, Tandeep S. Chadha, Jessica R. Ray, Wei-Ning Wang, Young-Shin Jun, and Pratim Biswas[#], "Measurement of sub-2 nm clusters of pristine and composite metal oxides during nanomaterial synthesis in flame aerosol reactors" *Analytical Chemistry (IF: 8.0)*, **2014**, 86 (15), 7523-7529, DOI: https://doi.org/10.1021/ac5012816; number of citations: 29 (Google Scholar).
18. Jessica R. Ray, Wei Wan, Benjamin Gilbert, and Young-Shin Jun[#], "Effects of formation

conditions on the physicochemical properties, aggregation, and phase transformation of iron oxide nanoparticles" *Langmuir (IF: 3.9)*, **2013**, 29 (4), 1069-1076, DOI: https://doi.org/10.1021/la3034319; number of citations: 20 (Google Scholar).

19. Yandi Hu, Jessica R. Ray, and Young-Shin Jun[#], "Na^+, Ca^{2+}, and Mg^{2+} in brines affect supercritical CO_2-brine-biotite interactions: Ion exchange, biotite dissolution, and illite precipitation" *Environmental Science & Technology (11.7)*, **2013**, 47 (1), 191-197, DOI: https://doi.org/10.1021/es301273g; number of citations: 45 (Google Scholar).
20. Jessica R. Ray, Byeongdu Lee, Jonas Baltrusaitis, and Young-Shin Jun[#], "Formation of iron(III) hydroxides on polyaspartate- and alginate-coated SiO_2: Effects of substrate hydrophilicity and functional groups at the surface" *Environmental Science & Technology (IF: 11.7)*, **2012**, 46 (24), 13167-13175, DOI: https://doi.org/10.1021/es302124g; number of citations: 46 (Google Scholar).
21. Daniel Garcia, Hongbo Shao, Yandi Hu, Jessica R. Ray, and Young-Shin Jun[#], "Supercritical CO_2-brine-clay induced dissolution, swelling, and secondary mineral formation on phlogopite surfaces at 75-95 °C and 75 atm" *Energy & Environmental Science (IF: 39.7)*, **2012**, 5 (2), 5758-5767, DOI: https://doi.org/10.1039/C2EE02026B; number of citations: 42 (Google Scholar).
22. Yandi Hu, Jessica R. Ray, and Young-Shin Jun[#], "Biotite–brine interactions under acidic hydrothermal conditions: fibrous illite, goethite, and kaolinite formation and biotite Surface Cracking" *Environmental Science & Technology (IF: 11.7)*, **2011**, 45 (14), 6175–6180, DOI: https://doi.org/10.1021/es200489y; number of citations: 66 (Google Scholar).
23. Hongbo Shao, Jessica R. Ray, and Young-Shin Jun[#], "Effects of salinity and the extent of water on supercritical CO_2-induced phlogopite dissolution and secondary mineral formation" *Environmental Science & Technology (IF: 11.7)*, **2011**, 45 (4), 1737-1743, DOI: https://doi.org/10.1021/es1034975; number of citations: 113 (Google Scholar).
24. Hongbo Shao, Jessica R. Ray, and Young-Shin Jun[#], "Effects of organic ligands on supercritical CO_2–induced phlogopite dissolution and secondary mineral formation" *Chemical Geology* (IF: 3.6), **2011**, 290 (3-4), 121-132, DOI: https://doi.org/10.1016/j.chemgeo.2011.09.006; number of citations: 37 (Google Scholar).
25. Hongbo Shao, Jessica R. Ray, and Young-Shin Jun[#], "Dissolution and precipitation of clay minerals under geologic CO_2 sequestration conditions: CO_2-brine-phlogopite interactions" *Environmental Science & Technology (IF: 11.7)*, **2010**, 44 (15) 5999-6005, DOI: https://doi.org/10.1021/es1010169; number of citations: 152 (Google Scholar).

MISCELLANEOUS

Patents

1. Jessica Steigerwald[2] and Jessica Ray (2021). *Spent coffee ground biochar, related methods of making, environmental remediation systems, and methods of removing contaminants from solution*. Application Number: PCT/US2021/056771; Filing Type: UTL-2; UW ID: 49039.02WO2.
2. Jessica Steigerwald[2] and Jessica Ray (2024). *Immobilized polymer surface functionalization of activated carbon for selective adsorption of per- and polyfluoroalkyl substances*. Application Number: 18/611, 269; Filing Type: UTL-2; UW ID: 49671.01US2.
3. Fanny Okaikue-Woodi[2] and Jessica Ray (2024). *Ferrate Fe(VI)-coated sand*. Application Number: 63/652, 869; Filing Type: PRO-1; UW ID 50108.01US1

Podcasts, News and Other Media

1. Modern Farmer, *On the Ground with Initiatives Responding to PFAS*, by Daniel Walton. June 2024. https://modernfarmer.com/2024/06/on-the-ground-with-initiatives-responding-to-pfas/
2. UW Civil & Environmental Engineering, *A biochar solution for urban runoff*, by Julia Davis. April 2024. https://www.ce.washington.edu/news/article/2024-04-08/biochar-solution-urban-runoff
3. OpenSciEd, *Water Wonders: Meet the Water Treatment Scientists & Engineers* 5th grade book. December 2024. https://cen.acs.org/sections/discovery-reports/clean-water-PFAS-solar-desalination-membranes-filtration-supercritical.html
4. American Association for the Advancement of Science SciLine, *Experts on Camera: PFAS*. April 2024. Dr. Jessica Ray: PFAS in water supplies;
   - Northern California Public Media: Pervasive and harmful, understanding PFAS and how you can limit exposure
   - WHNX Fox 21 Greenville, S.C.: How to reduce exposure to PFAS or forever chemicals
   - KWCQ NBC 6 Davenport, Iowa: Learn more about PFAS or Forever Chemicals
5. C&EN Water Magazine, *The future of clean water*, Discovery Report by Carmen Drahl and Jyllian Kemsley, Volume 2, December 2022.
6. C&EN Water Magazine, *Urban stormwater presents pollution challenge: Chemists look to adapt green infrastructure to manage emerging contaminants*, by Alla Katsnelson, Volume 100, Issue 6, February 2022. https://cen.acs.org/environment/water/Urban-stormwater-presents-pollution-challenge/100/i6
7. C&EN Stereo Chemistry podcast, *Jessica Ray and William Tarpeh on clean water, turning trash into treasure, and life as assistant professors*, December 2021. https://cen.acs.org/environment/water/Podcast-Jessica-Ray-William-Tarpeh/99/web/2021/12
8. Grit City Think and Drink, *Low-cost, engineered materials for enhanced contaminant removal in urban stormwater*, October 2021. https://www.youtube.com/watch?v=qwikEz7YbIA
9. PBS NOVA, *Why toxic "forever chemicals" are in the blood of most Americans*, June 2021. https://www.youtube.com/watch?v=9l66TZZfLEg
10. Thermo Fisher Scientific Season 2: Bringing Chemistry to Life (episode 7), *Fresh urban water*, May 2021. https://www.alfa.com/en/chemistry-podcasts/
11. University of Washington College of Engineering Outreach Black History Month Instagram post, March 2021. https://www.instagram.com/p/CLfMpELADlE/?utm_source=ig_web_copy_link
12. University of Washington, *The Daily* Newspaper Interview, March 2021. https://www.dailyuw.com/news/article_a56c67d2-8226-11eb-b16c-b7dd658457ed.htm
13. Harvard University podcast, *Pint-Sized Science: Keeping It Clean: Engineering New Ways To Remove Toxic Contaminants From Storm Water*, October 2020. https://sitn.hms.harvard.edu/podcast/pint-sized-science/2020/pint-sized-science-keeping-it-clean-engineering-new-ways-to-remove-toxic-contaminants-from-storm-water/

OTHER SCHOLARLY ACTIVITY

Invited lectures and seminars

1. Department of Civil and Environmental Engineering, Stanford University "Frontiers in Shaping the Future of Civil and Environmental Engineering" seminar series, *Design, characterization and application of functional, engineered materials for water treatment*, April 2025.
2. Department of Chemical Engineering, University of Washington, *Selective, polymer-imprinted activated carbon composite adsorbents for targeted removal of PFAS in wastewater*, October 2024.
3. Guest lecturer, FISH400, University of Washington, *Widespread occurrence of per- and polyfluoroalkyl substances (PFAS) in environmental waters*, April 2024.
4. Department of Bioengineering, University of Washington, *Selective, polymer-imprinted activated carbon composite adsorbents for targeted removal of per- and polyfluoroalkyl substances (PFAS) in wastewater*, April 2024.
5. Department of Civil & Environmental Engineering, University of Washington, *Hydrogen peroxide catalyzed reductive defluorination of perfluorooctanesulfonate (PFOS) by vanadium carbide (V_2C) MXenes*, March 2024.
6. Department of Chemistry, University of Buffalo Foster Colloquium Lecture, *Selective, polymer-imprinted activated carbon composite adsorbents for targeted removal of PFAS in wastewater*, March 2024.
7. Department of Chemistry, Willamette University, *Novel, polymer-imprinted activated carbon for targeted removal of per- and polyfluoroalkyl substances (PFAS) in water*, November 2023.
8. Department of Civil & Environmental Engineering, University of Michigan, *Novel, polymer-imprinted activated carbon media for selective adsorption of PFAS in water*, March 2023.
9. Department of Chemical and Biological Engineering, University of British Columbia, *Practical solutions to incorporate EDI+I into the classroom, lab and the department*, December 2022.
10. Department of Chemical and Biological Engineering, University of British Columbia, *Vanadium carbide (V_2C) nanomaterials for rapid, reductive defluorination of perfluorooctanesulfonate (PFOS) catalyzed by hydrogen peroxide*, December 2022.
11. Department of Civil & Environmental Engineering, University of California, Irvine, *Treatment of stormwater runoff using activated carbon derived from used coffee grounds*. May 2022
12. Guest lecturer, ChemE 475, Stanford University, *Electrochemical approaches for degradation of toxic contaminants in water*. May 2022.
13. Madison Park Academy College and Career Day, *The road to environmental engineering: My role in the water crisis*, March 2022.
14. Water and Environment Student Talks (WESTalks) Seminar Series, University of British Columbia, *Cost-effective, engineered and sustainably-produced media for stormwater runoff treatment*, February 2022.
15. Guest lecturer, GEOG 459A, University of Washington, *Urban stormwater management and*

treatment, December 2021.

16. Department of Chemical Engineering, University of Washington, *Vanadium carbide (V_2C) nanomaterials for rapid defluorination of perfluorooctanesulfonate (PFOS) catalyzed by hydrogen peroxide*, November 2021.
17. American Society of Civil Engineers, Environmental and Water Resources Institute, *Activated spent coffee ground biochar for enhanced urban stormwater contaminant removal*, November 2021.
18. Guest lecturer, EN.570.304, The Johns Hopkins University, *Urban stormwater management and treatment*, November 2021.
19. Department of Environmental Health and Engineering, The Johns Hopkins University, M. Gordon Wolman Seminar, *Hydrogen peroxide-catalyzed reductive defluorination of per- and polyfluoroalkyl substances (PFAS) by vanadium carbide nanosheets*, November 2021.
20. Grit City Think and Drink, *Low-cost, engineered materials for enhanced contaminant removal in urban stormwater*, October 2021.
21. Department of Civil and Environmental Engineering, University of Pittsburgh, *Vanadium carbide (V_2C) nanomaterials for rapid, defluorination of perfluorooctanesulfonate (PFOS) catalyzed by hydrogen peroxide*, October 2021.
22. Department of Chemical Engineering, University of California, Santa Barbara, *Reductive defluorination of perfluorooctanesulfonate (PFOS) by vanadium carbide (V_2C) nanosheets in the presence of hydrogen peroxide*, May 2021.
23. Puyallup Digital Learning, *Environmental engineering & my role in the water crisis*, April 2021.
24. Molecular Engineering & Sciences Seminar, University of Washington, *Vanadium carbide (V2C) catalytic nanomaterials for rapid, reductive defluorination of perfluorooctanesulfonate (PFOS),* April 2021.
25. Department of Civil, Construction & Environmental Engineering, Marquette University *Sustainable, engineered reactive media to enhance contaminant removal in urban stormwater*, April 2021.
26. Department of Chemical Engineering, University of California, Santa Barbara, *Vanadium carbide nanomaterials for catalytic defluorination of perfluorooctanesulfonate (PFOS) in water,* April 2021.
27. Department of Chemistry & Biochemistry, Dwain L. Ford Guest Lecture Series, Andrews University, *Vanadium carbide (V_2C) nanomaterials for rapid defluorination of perfluorooctanesulfonic acid (PFOS)*, March 2021.
28. Amazon Salons College of Engineering presentations, Civil and Environmental Engineering representative, *Used coffee ground biochar for urban stormwater treatment*, March 2021.
29. Guest lecturer, GEOG 459A, University of Washington, *Low-cost media for urban stormwater treatment*, March 2021.
30. Guest lecturer, CEE 102, University of Washington, *Grand challenges in environmental engineering*, January 2021.
31. Department of Civil and Environmental Engineering, University of Wisconsin, Madison, *Novel, biomimetic V_2C nanomaterials for enhanced defluorination of perfluorooctane*

sulfonic acid (PFOS), November 2020.

32. American Chemical Society Cal and Washington Chapter Seminar, *Improving stormwater and wastewater removal of contaminants using low-cost composites*, November 2020.
33. Department of Civil and Environmental Engineering, University of Massachusetts Amherst, *Novel biomimetic V_2C nanomaterials for enhanced defluorination of perfluorooctane sulfonic acid*, November 2020.
34. Reinventing the Nation's Urban Water Infrastructure (ReNUWIt) Seminar, *Low-cost composite geomedia for urban stormwater treatment*, November 2020.
35. Guest lecturer, LA 424, University of Washington, *Low-cost media for urban stormwater treatment*, November 2020.
36. Department of Materials Science and Engineering, North Carolina State University, *Enhanced defluorination of perfluorooctane sulfonic acid (PFOS) using novel, catalytic V_2C nanozymes*, October 20020.
37. Department of Chemical, Biochemical and Environmental Engineering, University of Maryland Baltimore County, *Enhanced defluorination of perfluorooctanesulfonic acid (PFOS) using novel, catalytic V_2C nanozymes*, October 2020.
38. Department of Civil & Environmental Engineering, University of Washington, *Low-cost material development for contaminant removal in the urban water sector*, October 2020.
39. Guest lecturer, LA 563 and 423, University of Washington, *Low-cost media for urban stormwater treatment*, May 2020.
40. Guest lecturer, CEE 350, *Dissolved oxygen, biochemical oxygen demand and the Streeter-Phelps model*, November 2019.
41. Department of Civil and Environmental Engineering, Northwestern University, *Low-cost polymer-clay composites for urban stormwater treatment*, October 2019.
42. Mary Gates Undergraduate Research Symposium, *Low-cost media for urban stormwater treatment*, July 2019.

Presentations given at conferences.

1. **Reagan Beers**,[2] Dijia Bao[3] and Jessica R. Ray, "Impact of the chemical intercalant on the structural properties and aqueous stability of V_2CT_x MXene." *Materials Research Symposium Spring 2025*, Seattle, WA, April 2025.
2. Yuemei Ye[1], Jessica Steigerwald[2], Shawnie Peng[3] and **Jessica R. Ray**, **"**Defluorination of perfluorooctanesulfonate (PFOS) by vanadium carbide (V_2C) MXenes catalyzed by hydrogen peroxide." *American Chemical Society National Meeting & Exposition*, San Diego, CA, March 2025. (**Invited Speaker**)
3. **Jessica R. Ray**, "Adsorptive media for stormwater treatment" *Northwest Environmental Business Council Managing Stormwater in Washington*, Tacoma, WA, March 2025. (**Invited Speaker**)
4. **Jessica R. Ray**, "Future Climate Leaders & Educators Panel." *Hip Hop Climate Conference*, November 2024 (**Invited Panelist**)
5. **Alanna Hildebrandt**,[2] Rose Martin[3], Caroline Conley[3], Melissa Gonzalez, Edward P. Kolodziej and Jessica R. Ray, "Investigating turf infill for tire derived anti-degradant transformation products." *National Sustainability Society's Inaugural Conference*, Seattle,

WA, September 2024.

6. **Reagan Beers**,[2] Dijia Bao[3] and Jessica R. Ray, "Synthesis and aqueous stability of vanadium carbide (V_2C) MXene films." *MXenes: Changing the World 2024*, Philadelphia, PA, June 2024.
7. Jessica Steigerwald[2], Shawnie Peng[3] and **Jessica R. Ray**, "Synthesis, characterization and assessment of a multi-templated imprinted polymer composite for selective adsorption and recovery of PFAS from secondary effluent." *American Chemical Society National Meeting & Exposition*, Denver, CO, August 2024 (**Invited Speaker**)
8. Jessica Steigerwald[2], Shawnie Peng[3] and **Jessica R. Ray**, "Polymer-imprinted activated carbon composites for targeted removal of per- and polyfluoroalkyl substances (PFAS) in wastewater." *Gordon Research Conference Membranes: Materials and Processes*, New London, NH, July 2024 (**Invited Speaker**)
9. **Alanna Hildebrandt**,[2] Ximin Hu, Theo Yih[3], Melissa Gonzalez, Hailey Germeau, Craig Rideout, Jessica R. Ray and Edward Kolodziej, "Evaluation of 6PPD-Quinone sorption to treatment media and engineered soil mixtures." *Water & Environment Student Talks (WEST)*, Vancouver, BC, Canada, June 2024.
10. **Reagan Beers**,[2] Dijia Bao[3] and Jessica R. Ray, "Synthesis and aqueous stability of vanadium carbide (V_2C) MXenes." *American Chemical Society Colloids and Surface Sciences,* Seattle, WA, June 2024.
11. **Reagan Beers**[2] and Jessica R. Ray, "Impact of chemical intercalant on vanadium carbide (V_2C) MXene stability." *American Chemical Society National Meeting & Exposition*, New Orleans, LA, March 2024.
12. **Fanny Okaikue-Woodi**[2] and Jessica R. Ray, "Synthesis of Fe(VI)-coated sand media for treatment of (in)organic contaminants in wastewater effluents." *American Chemical Society National Meeting & Exposition*, New Orleans, LA, March 2024.
13. **Jessica R. Ray**, "Oxidized vanadium carbide nanosheets for catalytic defluorination of PFAS in water." *American Chemical Society National Meeting & Exposition*, San Francisco, CA, August 2023. (**Invited Speaker**)
14. **Jessica R. Ray**, "Treatment of stormwater runoff organics using cost-effective, biochar adsorbent infiltration media." *American Chemical Society National Meeting & Exposition*, San Francisco, CA, August 2023. (**Invited Speaker**)
15. **Alanna Hildebrandt**[2] and Jessica R. Ray, "Evaluation of 6PPD-quinone removal from stormwater from stormwater runoff using soils and sorption media." *American Chemical Society National Meeting & Exposition,* San Francisco, CA, August 2023.
16. **Fanny Okaikue-Woodi**[2] and Jessica R. Ray, "Synthesis of Fe(VI)-coated sand composite media and application for enhanced removal of phenol." *American Chemical Society National Meeting & Exposition*, San Francisco, CA, August 2023.
17. **Jessica Steigerwald**[2] and Jessica R. Ray, "Immobilization of a multi-template imprinted polymer on spent coffee grounds activated carbon." *American Chemical Society National Meeting & Exposition*, San Francisco, CA, August 2023.
18. **Jessica R. Ray**, "The promises and problems of stormwater runoff." *Gordon Research Conference: Urbanization, Water and Food Security,* Tuscany, Italy, July 2023. (**Invited Speaker**)
19. **Fanny Okaikue-Woodie**[2] and Jessica R. Ray, "Synthesis of Fe(VI)-coated sand

composite for enhanced removal of phenol." *Gordon Research Conference: Urbanization, Water and Food Security*, Tuscany, Italy, July 2023. (poster)

20. **Jessica Steigerwald[2]** and Jessica R. Ray, "Comparison of novel single- and multi-templated molecularly imprinted polymer coatings on spent coffee grounds biochar for selective adsorption of perfluoroalkyl substances in water." *Gordon Research Conference: Urbanization, Water and Food Security*, Tuscany, Italy, July 2023. (poster)
21. **Jessica R. Ray**, "Design, characterization and application of novel materials for contaminant removal and degradation in the urban water sector." *American Chemical Society National Meeting & Exposition*, Chicago, IL, August 2022.
22. Yuemei Ye[1], Jessica Steigerwald[2], Hojeong Bang[3], Kaylie Dennehy[3] and **Jessica R. Ray**, "Vanadium carbide (V_2C) MXene nanosheets for catalytic defluorination of perfluorooctanesulfonate (PFOS) in the presence of hydrogen peroxide." *Environmental Sciences: Water Gordon Research Conference*, Holderness, NH, July 2022. (poster)
23. Yuemei Ye and **Jessica R. Ray**, "Rapid, reductive defluorination of per- and polyfluoroalkyl substances (PFAS) by MXene nanomaterials catalyzed by hydrogen peroxide." *American Chemical Society National Meeting & Exposition*, San Diego, CA, March 2022.
24. Jessica Steigerwald[2] and **Jessica R. Ray**, "Targeted adsorption of perfluorooctanesulfonate (PFOS) using molecularly imprinted polymer-modified biochar." *American Chemical Society National Meeting & Exposition*, San Diego, CA, March 2022. (**Invited Speaker**)
25. **Jessica Steigerwald[2]** and Jessica R. Ray, "Immobilization of a perfluorooctanesulfonate (PFOS) molecularly imprinted polymer adsorbent on spent coffee ground biochar for targeted PFOS removal." *EMCON: International Conference on Emerging Contaminants*, virtual, September 2021.
26. Fanny Okaikue-Woodi[2] and **Jessica R. Ray**, "Synthesis of ferrate, Fe(VI)-coated sand for oxidation and complexation of organic and inorganic contaminants in urban stormwater" *American Chemical Society National Meeting & Exposition*, Atlanta, GA, August 2021.
27. **Jessica Steigerwald[2]** and Jessica R. Ray, "Immobilization of a perfluorooctanesulfonate (PFOS) molecularly imprinted polymer adsorbent on spent coffee ground biochar for targeted PFOS removal." *American Chemical Society National Meeting & Exposition*, Atlanta, GA, August 2021.
28. Yuemei Ye[1] and **Jessica R. Ray**, "Vanadium carbide (V_2C) nanocatalysts for reductive defluorination of perfluorooctanesulfonate (PFOS) in the presence of hydrogen peroxide." *American Chemical Society National Meeting & Exposition*, Atlanta, GA, August 2021.
29. Ebony O. McGee, Maureen Kinyua, William Tarpeh, Jacelyn Rice-Bouyaue and **Jessica R. Ray**, "Beyond recruitment: Development of a guidance framework to foster Black junior environmental engineering faculty Succes." *Association of Environmental Engineering and Science Professors Appetizer Event*, July 2021.
30. **Jessica R. Ray**, "Spent coffee grounds biochar for effective, sustainable and cost-effective removal of trace organic urban stormwater contaminants." *American Chemical Society Northwest Regional Meeting Women Chemists Committee Pacific Northwest Rising Stars Symposium*, May 2021 (**Invited Speaker**).
31. **Yuemei Ye[1]** and Jessica R. Ray, "Enhanced oxidation and defluorination of perfluorooctane sulfonic acid via haloperoxidase-like V_2C nanozyme catalytic activity"

American Chemical Society National Meeting & Exposition Virtual Postdoc Symposium, online, November 2020.

32. **Yuemei Ye[1]** and Jessica R. Ray, "Simple and efficient defluorination of PFAS in wastewater by V_2C nanosheets and H_2O_2" *American Chemical Society National Meeting & Exposition*, online, August 2020.

33. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes, Yael G. Mishael and David L. Sedlak, "Improving stormwater and wastewater removal of contaminants Using low-cost Composites", *American Chemical Society National Meeting & Exposition*, San Diego, CA, August 2019 (**Invited Graduate Student Symposium Planning Committee Speaker**).

34. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay composites for passive removal of trace organic compounds and metals during urban stormwater treatment." *Association of Environmental Engineering and Science Professors Research and Education Conference*, Tempe, AZ, May 2019.

35. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay composites for sorptive removal of trace organic compounds and metals during urban stormwater treatment." *American Chemical Society National Meeting & Exposition*, Orlando, FL, March 2019.

36. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay composite geomedia for adsorption of trace contaminants during urban stormwater treatment." *Gordon Research Conference on Environmental Science: Water*, Holderness, NH, June 24 – June 29, 2018. (poster)

37. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymeric functionalized clay composites for adsorption of trace contaminants in urban stormwater." *American Chemical Society National Meeting & Exposition*, New Orleans, LA, March 18-22, 2018.

38. **Jessica R. Ray**, Sirimuvva Tadepalli, Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie, Srikanth Singamaneni, and Young-Shin Jun, "Photothermal and hydrophilic functionalization of reverse osmosis membranes for enhanced resistance of mineral scaling, organic, and bio-fouling." *American Chemical Society National Meeting & Exposition*, San Francisco, CA, April 2-6, 2017.

39. **Jessica R. Ray**, Sirimuvva Tadepalli, Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie, Srikanth Singamaneni, and Young-Shin Jun, "Nanostructure-enabled membranes for better reverse Osmosis processes." *American Chemical Society National Meeting & Exposition*, San Diego, CA, March 13-17, 2016.

40. **Jessica R. Ray**, Chelsea W. Neil, Haesung Jun, Zhichao Liu, and Young-Shin Jun, "Effect of Fe^{2+} and Cr(VI) on Redox-active CeO_2 nanoparticle surface properties and transformation in aqueous Systems." *American Chemical Society National Meeting & Exposition*, San Diego, CA, March 13-17, 2016.

41. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Efficacy of $CaCO_3$ and $CaSO_4$ scaling resistance of polyethylene glycol hydrophilically-modified reverse osmosis membranes in the presence of humic acid." *American Chemical Society National Meeting & Exposition*, Denver, CO, March 22-26, 2015.

42. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Photothermally active reverse osmosis membranes for improved resistance against mineral scaling and organic bio-fouling." 249th *American Chemical Society National Meeting & Exposition*, Denver, CO,

March 22-26, 2015. (poster)

43. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "In situ investigation of nucleation mechanisms governing iron(III) (hydr)oxide formation on environmentally abundant polymeric organic-coated substrates." *Argonne National Laboratory Meeting SES-VI*, Argonne IL, September 11-12, 2014. (poster)

44. **Jessica R. Ray**, Sirimuvva Tadepalli, Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie Tang, Srikanth Singamaneni, and Young-Shin Jun, "Photothermally active reverse osmosis membranes for improved resistance against mineral scaling and organic bio-fouling." *Gordon Research Conference on Environmental Science: Water*, Holderness, NH, July 27 – August 1, 2014. (poster)

45. **Jessica R. Ray**, Benjamin Gilbert, and Young-Shin Jun, "Drying-induced aggregation and phase transformation of iron oxide nanoparticles: *In situ* and *ex situ* properties governed by formation conditions." *50th Anniversary Annual Meeting of the Clay Minerals Society*, Urbana, IL, October 6-10, 2013.

46. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Hydrophilicity and surface functional group-controlled iron(III) hydroxide formation on polymer-coated substrates." *18th Annual Mid-American Environmental Engineering Conference*, St. Louis, MO, September 20-21, 2013.

47. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Reverse osmosis membrane modification for calcium carbonate fouling inhibition." *18th Annual Mid-American Environmental Engineering Conference*, St. Louis, MO, September 20-21, 2013. (poster)

48. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Effects of surface hydrophilicity and functional group of organic-coated substrates on iron(III) (hydr)oxide nucleation." 245th *American Chemical Society National Meeting & Exposition*, New Orleans, LA, April 7-11, 2013.

49. **Jessica R. Ray**, Byeongdu Lee, Jonas Baltrusaitis, and Young-Shin Jun, "Surface hydrophilicity and functional group-driven iron(III) hydroxide nucleation on organic-coated substrates in Aqueous Environments." 2012 *American Geochemical Union Meeting*, San Francisco, CA, December 3-7, 2012. (poster)

50. **Jessica R. Ray**, Wei Wan, and Young-Shin Jun, "Effects of synthesis conditions on simultaneous hematite and maghemite nanoparticle formation, their physico-chemical properties, and arsenate adsorption." *Gordon Research Conference on Environmental Nanotechnology*, Manchester, NH, May 29 – June 3, 2011. (poster)

51. **Jessica R. Ray,** Barry Williams, Hiro Mukai, "A lesson in water chemistry: Encouraging middle school students to pursue a future in engineering." *NSF GK-12 Annual Meeting*, Washington, D.C., March 26-28, 2010. (poster)

52. **Jessica R. Ray**, Wei Wan, and Young-Shin Jun, "Effects of Fe^{3+} injection rate, cooling and drying method on particle size, morphology and mineral phase of iron oxide nanoparticles." *American Chemical Society National Meeting & Exposition*, San Francisco, CA, March 21-25, 2010. (poster)

Professional society memberships

American Chemical Society, 2009 – Present
Association of Environmental Engineering and Science Professors, 2014 – Present
American Geophysical Union, 2009 – 2020

Professional development

1. UW "Inclusive Excellence Faculty Fellowship Program", participant Fall 2024 – Spring 2025.
2. Faculty JEDI Training Session hosted by the Future Rivers Program, attendee, February 2023.
3. SpeakOut Institute, "Creating a Resiliency Toolkit for Women of Color with Ericka Huggins" participant, virtual, March 2022.
4. UW ADVANCE Pre-Tenure Workshop participant, virtual, May 2021.
5. National Science Foundation Engineering CAREER Workshop participant, virtual, April 21 – 23, 2021.
6. SpeakOut Institute, "Asian Americans: Facing Hate, Fighting for Justice, and Shaping America" participant, virtual, April 2021.
7. SpeakOut Institute, "Virtual Book Launch: *Dispatches from the Race War* with Tim Wise", participant, virtual, January 2021.
8. SpeakOut Institute Summer Institute participant, virtual, July 13 – 16, 2020.
9. National Center for Faculty Development & Diversity Faculty Success Program participant, virtual, Summer 2020.
10. Early Career Women Faculty of Color mentoring group, participant. October 2019 – present.
11. University of Washington Faculty Fellows Program participant, September 2019.
12. UW ADVANCE Launching Academics on the Tenure-Track: An Intentional Community in Engineering (LATTICE) participant, March 2019.
13. Association of Environmental Engineering and Science Professors Global Mentorship Initiative participant, January 2019.

Peer Reviewing Journals

Environmental Science & Technology; 10 articles reviewed

Environmental Science & Technology Letters; 2 articles reviewed

Environmental Science: Nano; 2 articles reviewed

Environmental Science: Water Research & Technology; 1 article reviewed

ES&T Engineering; 2 articles reviewed

ES&T Water; 2 articles reviewed

Journal of Hazardous Materials; 6 articles reviewed

Journal of Hazardous Materials Letters; 2 articles reviewed

Journal of Physical Chemistry; 1 article reviewed

Journal of Water Management Modeling; 1 article reviewed

Langmuir; 1 article reviewed

Water Research; 4 articles reviewed

GRADUATE STUDENTS

Postdoctoral Scholars

- Yuemei Ye, Ph.D., April 2019 – May 2021, Assistant Professor in Chemistry at Lehman College
- Katya Cherukumilli, Ph.D., January 2019 – March 2020, Assistant Professor in Human Centered Design & Engineering at University of Washington

Chaired Doctoral Degrees (served as committee chair)

- Fanny Okaikue-Woodi, Chair, *Development of ferrate(Fe(VI))-coated sand composites for stabilized reactivity and remediation of (in)organic contaminants in synthetic wastewater effluent*, Spring 2024, Environmental Protection Agency Federal Postdoc
- Jessica Steigerwald, Chair, *Development of a novel biochar-molecularly imprinted polymer composite for targeted adsorption of perfluoroalkyl substances in water treatment applications*, Fall 2023, Southern Nevada Water Authority Process Systems Engineer

Chaired Doctoral Degrees (served as committee member)

- Sin-Yi Liou, Member, *Novel (advanced) oxidation and disinfection processes based on reactions of free available chlorine or hydrogen peroxide with unconventional activating agents: Superoxide radical and non-ferrous/non-cuprous metal(loid) oxide catalysts*, Spring 2023, Postdoctoral Researcher at Gwangju Institute of Science and Technology

Chaired Doctoral Degrees (served as GSR)

- Lorenzo Guio, Graduate Student Representative, *Understanding the relationships between the structure and the physical properties of conjugated polymers using particle scattering and electronic properties*, Spring 2024, Postdoctoral Scholar at the University of Washington
- Seokhwan (Steve) Chung, Graduate Student Representative, *Multifunctional nanoparticles for cancer imaging and therapy*, Fall 2022

Current Doctoral Students (serving as committee chair)

- Priya Seetharaman, Chair, 1st year
- Kaylyn Stewart, Chair, 1st year
- Aparna Lobo, Materials Science & Engineering, Chair, 3rd year, passed qualifying exam
- Reagan Beers, Molecular Engineering & Sciences Institute, Chair, 3rd year, passed qualifying exam
- Alanna Hildebrandt, Chair, 4th year, passed qualifying exam
- Jennifer Hooper, Co-Chair with Prof. Michael Dodd (Chair), 5th year, passed general exam

Current Doctoral Students (serving as committee member)

- Annapaola Panico, Committee Member, 2nd year, passed qualifying exam
- Sydney Floryanzia, Graduate Student Representative, 4th year, passed general exam
- Joelle Scott, Committee Member, 3rd year, passed qualifying exam
- Brian Roman, Committee Member, 3rd year, passed general exam

Chaired Masters Degrees (served as committee chair)

- Amy Quintanilla, Chair, *Fungus-inoculated biochar as a low-cost media for stormwater treatment*, Fall 2024.
- Jessica Steigerwald, Chair, Thesis, *Development of a novel biochar-molecularly imprinted polymer composite for targeted adsorption of perfluoroalkyl substances in water treatment*

applications, Spring 2022, Southern Nevada Water Authority Process Systems Engineer

- Nicole Redden, Chair, Thesis, *Viability of spent coffee ground biochar as a filtration media to remove organic contaminants from urban stormwater in the Pacific Northwest*, Spring 2021.

Chaired Masters Degrees (served as committee member)

- Aishwarya Das, Co-Chair (Prof. Rachel Scholes, University of British Columbia, Chair), *Iron-based reactive soil amendments for the treatment of stormwater-derived trace organic contaminants in bioretention systems,* Fall 2024.
- Wanyu Mao, Co-Chair (Prof. Gregory Korshin, Chair), Thesis, *Iron release in microelectrolysis treatment for arsenic removal from landfill gas condensate and its use to predict arsenic removal efficiency*, Spring 2024.
- Geneva Schlepp, Co-Chair (Prof. Gregory Korshin, Chair), Thesis, *Continued optimization of a microelectrolysis treatment process for removal of arsenic from landfill gas condensate, characterization of materials, and evaluation of Fe as a predictor of treatment monitoring*, Winter 2024
- Meredith Renz, Co-chair (Prof. Steve Muench, Chair), Thesis, *Stormwater treatment media for U.S. Navy constituents of interest*, Summer 2023.
- Ivette Andrea Pinochet Troncoso, Co-chair (Prof. Gregory Korshin, Chair), Thesis, *Optimization of microelectrolysis treatment to remove arsenic from landfill gas condensate and correlations between changes of redox potential and arsenic removal*, Spring 2023.
- Samuel Walters, Co-chair (Prof. Gregory Korshin, Chair), Thesis, *A study of removal techniques for arsenic species in landfill gas condensate*, Summer 2022.
- Aminda Cheney-Irgen, Co-chair (Prof. Gregory Korshin, Chair), Thesis, *Mass balance of arsenic in microelectrolysis treatment of arsenic-containing landfill gas condensate and initial study of formation of volatile arsenic species*, Spring 2022.
- Gabriel Rifkin, Co-chair (Prof. Gregory Korshin, Chair), Thesis, *Arsenic in landfill gas condensates and gas treatment solids: A study of removal by alternative treatment approaches and mobilization*, Winter 2021, current employer: Environmental Resources Management engineer

Chaired Coursework Only Masters

- Brendan Zwiefel, Advisor, Coursework only, Spring 2024.
- Sophia Jessum, Advisor, Coursework only, Fall 2023.
- Yanglin Liu, Advisor, Coursework only, Fall 2022.
- Samuel Scherer, Advisor, Coursework only, Spring 2021.
- Cecilia Welch, Advisor, Coursework only, Spring 2021.
- Sara Lucero, Advisor, Coursework only, Fall 2021.

Current Masters Students

- Kovas Zygas, Chair, 2nd year, Thesis, *Evaluation of commercial sorbents for uptake of (ultra)short-, short- and long-chain per- and polyfluoroalkyl substances (PFAS) in wastewater*, expected Summer 2025.

Current Coursework Only Masters

- Emily Kindelberger, Advisor, Coursework only, 2nd year.
- Cal Shurman, Advisor, Coursework only, 1st year.
- Anthony Savoca, Advisor, Coursework only, 1st year.

Masters Students Research Assistants

- Anusha Srivatsa, Advisor, Volunteer (SPR22), assisted Jessica Steigerwald (former PhD student) with lab tests
- Megan Vance, Advisor, Volunteer (SPR22), assisted Fanny Okaikue-Woodi (former PhD student) with lab tests
- Shawna Myatt, Advisor, Independent Study (WIN20 – SPR20), wrote a report on green stormwater infrastructure and assisted Fanny Okaikue-Woodi (former PhD student) with lab tests

Current and Past Undergraduate Students Mentored

- Evan Eadie, UW ENGRUD, undergraduate research assistant, WIN25 – present
- Caroline Conley, UW Psychology, undergraduate research assistant, AUT24 – present
- Rose Martin, UW Civil & Environmental Engineering, undergraduate research assistant, AUT24 – present
- Kiana Gholamy, UW ENGRUD, undergraduate research assistant, WIN24 – present
- Carmen Tran, UW Civil & Environmental Engineering, undergraduate research assistant, AUT23 – WIN24
- Dijia Bao, UW Chemical Engineering, undergraduate research assistant, AUT23 – present
- Reyna Lumagui, UW Chemical Engineering, undergraduate research assistant, WIN22 – SPR24
- Theo Yih, UW Chemical Engineering, undergraduate research assistant, AUT22 – SPR24
- Yiran Wan, Sichuan University, undergraduate research assistant visiting on an internship funded by Sichuan University, August – November 2022
- Michelle Kane, Washington University in St. Louis, undergraduate research assistant, SUM22
- Shawnie Peng, UW Chemical Engineering, undergraduate research assistant, AUT21 – WIN23
- Joseph Severin, UW Chemical Engineering, undergraduate research assistant, AUT21 – SPR22
- Joshua Chong, UW Chemical Engineering, undergraduate research assistant, WIN21 – SPR23
- Vivian Jones, UW Chemical Engineering, Honors research, ChemE Chair: Prof. Lilo Pozzo, SPR21 graduation.
- Hojeong Bang, UW Civil & Environmental Engineering, undergraduate research assistant, AUT19 – SPR20.
- Max Steiner, UW Chemical Engineering, Honors research, ChemE Chair: Prof. Lilo Pozzo, SUM19 – SUM20.
- Daaniya Iyaz, UW Bioresource Science and Engineering undergraduate research assistant, SPR19 – WIN20.
- Kaylie Dennehy, UW Civil & Environmental Engineering, volunteer, undergraduate researcher, SPR19 – AUT19.

RESEARCH ACTIVITIES

Funded Research

TOTAL to UW: $4,013,224 **TOTAL to Me: $1,775,482**

Funding Agency	***Title***	**Your role with other PI's and co-PI's**	**Total Amount, Your Amount**	**Dates (start - finish)**
UW Campus Sustainability Fund	*Investigating stormwater runoff for tire derived anti-degradants from athletic fields (Phase 2)*	PI	Total amount $66,728 my amount $66,728	04/2024 – 04/2025
King County	*King County Wastewater Treatment Technology Research Award; Topic: Characterizing the fate and transport of microplastics during wastewater treatment*	co-PI; PI Dodd	Total amount $584,841, my amount $182,542	09/2025 – 06/2028
King County	*King County Wastewater Treatment Technology Research Award; Topic: Assessment of novel and existing media used for separation of per- and polyfluoroalkyl substances (PFAS) in wastewater*	co-PI; PI Mari Winkler	Total amount $584,841, my amount $182,542	09/2023 – 06/2025
UW Campus Sustainability Fund	*Investigating stormwater runoff for tire derived anti-degradants from athletic fields (Phase 1)*	PI	Total amount $20,586, my amount $20,586	04/2024 – 06/2024
DOD, Strategic Environmental Research and Development Program (SERDP)	*Novel functionalization of conventional sorbents for enhanced selectivity and improved concentration of ultrashort- and short-chain PFAS*	Co-PI; PI: Lee Blaney, Wenqing Xu, Ke He	Total amount $750K, my amount $250K	5/2024 – 1/2027
NSF	*Ferrate (Fe(VI))-coated sand media for simultaneous oxidation of organic contaminants and adsorption of trace metals*	PI	Total amount $360K, my amount $360K	8/2023 – 5/2026

NSF	*MRI: Acquisition of a LC-High Resolution Mass Spectrometer for Characterization of Environmental Organic Contaminants*	co-PI	Total amount $797K, my amount $0	09/2021 – 08/2024
NSF	*Beyond recruitment: Development of a guidance framework to foster Black junior environmental engineering faculty success*	PI, Co-PIs: William Tarpeh, Jacelyn Rice- Boayue, Consultant: Maureen Kinyua	Total amount $73K, my amount $45K	07/2022 – 02/2024
NSF	*CAREER: Targeted, catalytic reduction of persistent organohalogens in water using a novel V_2C MXene-imprinted polymer composite*	PI	Total amount $500K, my amount $500K	05/2022 – 04/2027
UW CoMotion STEP Award	*Coffee biochar water treatment project*	PI	Total amount $10K, my amount $10K	05/2022 – 11/2022
NSF, MEM-C	*Robust and regenerable molecularly imprinted polymer (MIP)/carbon nanotube (CNT) filters for selective removal of perfluoroalkyl acids (PFAAs)*	PI, co-PI: Lucas Meza, UW Mechanical Engineering	Total amount $50K, my amount $25K	10/2020 - 09/2022
UW CoMotion	*Spent coffee ground biochar filtration media*	PI	Total amount $50K, my amount $50K	01/2021 – 12/22
Washington Research Foundation	*Upcycled spent coffee grounds as biochar for enhanced urban stormwater contaminant removal*	PI	Total amount $20K, my amount $20K	10/2020 – 03/2021
Washington Research Foundation (gift), Royalty Research Fund	*Fe(VI)-coated sand for passive oxidation of toxic and persistent polychlorinated biphenyls in urban stormwater*	PI	Total amount $40K, my amount $40K	06/2019 – 05/2020

UW Campus Sustainability Fund	*BIOSWALE UW*	Co-PI, PI: Amy Kim Co-PI: Brook Sullivan	Total amount $106K, my amount $46K	11/2019 – 10/2020

Pending Proposals

Funding Agency	***Title***	**Your role with other PI's and co- PI's**	**Total Amount, Your Amount, (Subcontracts if any, University Matching if any)**	**Dates (start - finish)**
UW Royalty Research Fund	*Evaluation of "salmon safe" crumb rubber infill for athletic playing fields*	PI	Total amount $40K, my amount $40K	06/2025 – 05/2026
NSF	*S-STEM: Creating pathways for transfer student achievement in energy and infrastructure*	Senior Personnel; PI Lucas Meza	Total amount $5M, my amount, $0	09/2025 – 08/2031
Tire Industry Project	*Assessing tire char as a treatment media for stormwater runoff*	Co-PI; PI Jenifer McIntyre	Total amount $400K, my amount $238K	05/2025 – 11/2026
Natcast	*Ceramic ion-exchange resins for PFAS abatement in semiconductor manufacturing waste*	Co-PI; PI Membrion, Inc.	Total amount $5.5M, my amount $531K	06/2025 – 12/2027
EPA	*Proactive remediation for climate justice: community-centered approaches to contaminant removal*	co-PI; PI Melanie Malone	Total amount $20M my amount $300K	06/2025 – 06/2028

Unfunded Proposals

Funding Agency	***Title***	**Your role with other PI's and co- PI's**	**Total Amount, Your Amount, (Subcontracts if any, University Matching if any)**	**Dates (start - finish)**

EPA	*Development and Deployment of Nanosensor Arrays for High-Precision Detection and Catalytic Destruction of Per- and Polyfluoroalkyl Substances in Impacted Surface Water*	PI; Co-PIs Carla Ng, Srikanth Singamaneni, Vikram Iyer	Total Amount, $1.5M my amount $425K	10/2024 – 09/2027
NASA	*Co-powerment with Alsen: A Community-Driven Approach for Environmental Justice in Cancer Alley, Baton Rouge, LA*	Co-PI; PI Millard McElwee	Total amount $6.5M, my amount $1M	07/2024 – 06/2027
NSF	*DISES-EX: Dynamic integration of marginalized stakeholder values for the development of stormwater runoff treatments*	co-PI; PI Bethany Gordon	Total amount $750,000, my amount $300K	11/2024 – 10/2027
NSF	*MRI: Acquisition of an IC/LC/single particle-ICP-time of flight-MS system for all-element characterization of environmental micro/nanoparticles and chemical contaminants*	PI	Total amount $1.39M, my amount $0 K	09/2024 – 08/2027
NSF	*NSF-NSERC: Iron-biochar composites as regenerable, reactive amendments for hydrophilic stormwater contaminant degradation*	PI; unfunded co-PI Rachel Scholes (University of British Columbia, Canada)	Total amount $330K, my amount $165K	9/24 – 8/27

DOCUMENTATION OF TEACHING EFFECTIVENESS

Courses Taught & Student Evaluations

Item 1 = Course as a whole
Item 3 = Instructor's contribution to the course
Item 4 = Instructor effectiveness in teaching subject matter
Overall adjusted mean = overall index of class quality

Course	Title	Quarter	Credit Hrs	Enrollment	Evaluations? Response	Item 1	Item 3	Item 4	Overall Adj. Median

CEE 357	Environmental Engineering	AUT24	5	68	Yes 62/68	4.6	4.8	4.7	4.7
CEWA 549	Physical-Chemical Treatment Processes	SPR24	3	12	Yes, 12/12	4.4	4.5	4.4	4.4
CEE 498/CEWA 599	Stormwater Management & Treatment (Special Topics)	WIN24	3	17	Yes 11/17	4.7	4.8	4.9	4.8
CEE 357	Environmental Engineering	WIN24	5	40	Yes 36/40	4.2	4.6	4.6	4.4
CEWA 549	Physical-Chemical Treatment Processes	SPR23	3	10	Yes, 10/10	4.2	4.7	4.4	4.4
CEE 357	Environmental Engineering	WIN23	5	52	Yes, 21/52	3.5	4.3	3.9	3.8
CEE 498/CEWA 599	Stormwater Management & Treatment (Special Topics)	AUT22	3	15	Yes, 14/15	4.2	4.4	4.0	4.2
CEWA 549	Physical-Chemical Treatment Processes	SPR22	3	6	Yes, 4/6	4.5	4.6	4.6	4.5
CEE 357	Environmental Engineering	WIN22	5	66	Yes, 52/66	4.3	4.6	4.5	4.5
CEWA 549	Physical-Chemical Treatment Processes	SPR21	3	12	Yes, 10/12	3.9	4.7	4.7	4.4
CEE 357	Environmental Engineering	WIN21	5	71	Yes, 59/71	4.7	4.9	4.9	4.8
CEE 357	Environmental Engineering	SPR20	5	73	Yes, 59/73	4.2	4.7	4.7	4.6
CEWA 549	Advanced Topics in Environmental Engineering, Chemistry and	WIN20	3	9	Yes 9/9	3.6	4.2	4.2	3.9

CEE 357	Environmental Engineering	SPR19	5	72	Yes, 34/72	2.3	3.0	2.1	2.4

Peer Teaching Evaluations

Course	Quarter	Reviewer
CEWA 599/CEE 498	Winter 2025	Brett
CEWA 549	Spring 2024	Lundquist
CEWA 549	Spring 2023	Korshin
CEE 357	Winter 2022	Lundquist
CEE 357	Winter 2021	Brett
CEWA 549	Winter 2020	Korshin

Independent Study

Course	Student Name	Research Description	Quarter	Credit Hours
ChemE 499	Dijia Bao	Assisted with stormwater pot study mesocosms	Fall 2024	3
ChemE 499	Reyna Lumagui	Assisted with assessment of novel PFAS sorbent	Spring 2022	3
ENVIR 491	Crystal Chen	Advised with their capstone investigating decentralized wastewater treatment strategies	Winter 2022	3
CEE 599	Cecilia Welch	Contacted WA State utilities and engineers to survey current stormwater management activities	Spring 2021	2
CEE 499	Shawna Myatt	Conducted case studies and experiments related to biochar stormwater treatment	Winter 2020	3
CEE 599	Zheng Luo	New synthesis method for selective polymer-coated sand composite	Winter 2020	3

SERVICE

Departmental service

1. CEE Valle Committee January 2024 – present
   - Review applications for CEE graduate students applying for research exchanges in Nordic countries
2. External Engagement Faculty Committee September 2023 – present
   - Worked with CEE Graduate Student Advisory Board and faculty members to develop databases of industry and community organization partners to feature on the CEE website
   - Helped identify new tactics to increase reach of the CEE Bridge Newsletter to new partners and potential donors
3. Graduate Education Faculty Committee September 2021 – 2023
   - Partnered with committee members and graduate student advisory board members

to increase transparency of graduate admissions timeline and Ph.D. qualifying exam requirements and expectations

- Worked within subcommittee to develop rubric for admitting Masters and PhD students into CEE

4. Environmental Engineering Laboratory Co-Director August 2021 – December 2023
   - Organized multiple, large-scale clean-ups of More Hall 319 and 324 to clear detritus remaining from generations of researchers
   - Co-supervised a research staff member and a 50% FTE lab manager to provide oversight on tasks associated with lab health and safety, waste management, personnel onboarding and training, chemicals management and other research support
   - Led large-scale effort to properly code and catalog thousands of chemicals into the UW MyChem online chemical inventory system.
5. Justice, Equity, Diversity and Inclusion (JEDI) Faculty Committee January 2019 – 2021
   - Implemented structural, departmental initiatives to help faculty and staff increase inclusivity (e.g., including gender pronouns in email signatures and class syllabi)
   - Co-organized JEDI monthly book club meetings to discuss anti-racism, racism in academia and other important topics related to creating a more inclusive and equitable climate in the department
   - Worked with student committee members to create a student-peer mentoring program to facilitate mentoring of younger undergraduate students by upper-level undergraduate students
   - Coordinated with University of Washington College of Engineering staff to institute a formalized diversity, equity and inclusion training for the department faculty and staff which included submission of a UW Diversity Seed Grant proposal
6. 2021 Faculty Search Committee Member Spring 2021
   - Served on a search committee for an open hire across disciplines in our department which included review of over 60 applications, phone interviews, design of evaluation rubrics and coordination of remote interviews (over 90 h)
7. Anti-racism Book Club Facilitator Summer 2020 – present
   - Initiated an anti-racism book club with my research group members and professional masters students for whom I am advising to grow and learn about systemic racism, anti-Black violence and police brutality, and environmental justice
8. Undergraduate Admissions Committee May 2020
   - Provided recommendations and reviewed applications for BSEnVE undergraduate admissions to CEE
9. Undergraduate Mentoring Session Panelist May 2020
   - Participated in 1-h environmental engineering mentoring session panel to help current BSEnVE juniors prepare for classes and graduation requirements for senior year
10. Invited Speaker Coordinator October 2019, November 2020
    - Organized Prof. Nancy Love 2019 Kappe Lecture talk and visit to our department
    - Assisted staff in coordination and arrangement of Dr. Khalid Kadir's 2020 Visiting Burges Professorship virtual visit and talk
11. Undergraduate Scholarship Review Committee June 2019

- Reviewed applications for undergraduate College of Engineering awards for CEE students

College service

1. CoE Dean Review Advisory Committee Member December 2024 – present
2. Boeing International Professorship Faculty Review Committee Member June 2024
3. ENGR 101 "Environment, Sustainability & Energy" Faculty panelist AUT 2023, 2024
4. CEE Chair Search Advisory Committee Member March 2022 – Sept. 2022
   - Met with departmental stakeholder groups (e.g., assistant professors, research area groups, student leaders) to receive input about concerns within the department. Held weekly meetings with committee members to develop rubrics and selection criteria, meet with candidates, and communicate with CEE faculty members.
5. MolE Ph.D. Graduate School Interdisciplinary Committee Member Dec. 2020 – Present
   - Met with co-chair and fellow committee members to outline revised graduate student admission to the Molecular Engineering& Sciences Institute program (40 hours)
6. Women in Science & Engineering (WiSE)/Society of Women Engineers (SWE) Celebration of First-Year Female ENGRUDS & Excellence Mentor May 2021, 2022
   - Met with freshman, female engineering students after completing their first year in engineering to provide mentorship and support (1.5 hours)
7. College of Engineering Strategic Planning Focus Group Member May 2020
   - Participated in a focus group for assistant professors within the college to assist Dean Allbritton in developing a new strategic plan for the college

University service

1. Molecular Analytical Facility Director Review Committee Member WIN 2025 – present
2. Royalty Research Fund Reviewer November 2024
3. UW National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) chapter "Resilience in Research: Stories from the Field" panelist April 2024
4. Advising & Orientation "Classroom Expectations" faculty speaker Summer 2023, 2024
5. Lunch with Representative Vandana Slatter (organized by Dean Allbritton) May 2022
6. Engineering Dean's Scholars program (formerly SEEEDS) guest speaker 2021, 2022
7. Royalty Research Fund Reviewer October 2021

Professional society and other service

1. American Chemical Society "Women in Science & Engineering" Symposium co-chair and organizer August 2025
2. Association of Environmental Engineering & Science Professors 2024 Academic Job Application Review (AJAR) Program Volunteer Reviewer September 2024
   - Reviewed and provided feedback on 3 graduate student and postdoc faculty application package materials
3. Gordon Research Conference Environmental Sciences: Water "Power Hour" June 2024
   - Initiated a conference attendee climate survey that will be adapted for future conferences to assess sense of inclusion and diversity at the meeting
   - Co-led an activity at the conference to engage graduate students, postdocs, and faculty

across all career stages to identify common obstacles within academia that impede success

4. National Science Foundation Advisory group member; PI Henry Tran, University of South Carolina 2023 – present
   - Advising the proposal team with the development of a diversity climate survey for Black and Hispanic Engineering Faculty at R1 institutions
5. Association of Environmental Engineering & Science Professors Outreach and Liaison Taskforce member; Taskforce has since converted to the Diversity, Equity, Inclusion and Accessibility (DEIA) Committee 2023 – present
6. *ACS ES&T Engineering* Early Career Board member 2022 – 2024
7. *ACS Applied Engineering Materials* Editorial Advisory Board member 2022 – 2024
8. *Journal of Hazardous Materials* Early Career Board member 2022 – present
9. American Chemical Society, Environmental Chemistry Symposium Chair 2022, 2023
10. *Journal of the American Chemical Society (JACS) Au* Board Member Fall 2021 – present
    - Charged with increasing *JACS Au* visibility, helping the journal become more aware of emerging trends and areas of importance to young, emerging scientists (1-2 year term)
11. Association of Environmental Engineering & Science Professors Meeting Organizer, July 2021
    - Lead a workshop required for all meeting attendees intended to promote success of Black junior Environmental Engineering faculty
12. Association of Environmental Engineering & Science Professors Strategic Planning Meeting participant February 2021
    - Discussed 2021 vision for the environmental engineering professional association (4 hours)
13. American Geophysical Union Session Chair December 2020
    - Presided over the "Harnessing Fundamental Geochemical Insights for Deployable Subsurface and Environmental Technologies" session during the virtual 2020 AGU meeting
14. American Chemical Society Environmental Division Session Chair August 2020
    - Presided over the "Reactive Materials & Processes for Sustainable, Resource-Efficient Water Treatment" session during the virtual 2020 Fall ACS meeting

Community service

1. UPrep Middle & High School "Intro to Engineering" guest speaker January 2025
2. Hip Hop is Green community outreach activity Summer 2022, 2023, 2024
   - Worked with black youth participants to conduct water filtration experiments, and led a lesson about environmental engineering and sustainable water treatment
3. Chinook Middle "Engineering BIPOC Youth Education" guest speaker March 2022
4. Madison Park Academy "College and Career Day" guest speaker March 2022
5. Association of Environmental Engineering and Science Professors "Coffee Hour" meeting panelist January 2022
   - Discussed importance of internal and external mentoring for assistant professors
6. University of Washington *The Daily* Newspaper interview March 2021

- Interviewed with a student report from The Daily about the Cell Mentor "1,000 Inspiring Black Scientists in America"
- https://www.dailyuw.com/news/article_a56c67d2-8226-11eb-b16c-b7dd658457ed.html

7. Washington University in St. Louis Prospective Graduate Student panelist February 2021
   - Participated in a virtual panel for the Washington University in St. Louis Department of Energy, Environmental & Chemical Engineering alumni panel (30 min)
8. Guest presentation at Shorewood High School January 2020
   - Guest lectured for 1-h to high school students in Mrs. Gloria Horne's Honors/AP Chemistry course about my career in engineering and my research interests
9. University of Washington College of Engineering Outreach highlight March 2021
   - Prepared responses for Instagram post highlighting Black engineering faculty at UW during Black History Month
   - https://www.instagram.com/p/CLfMpELADlE/?utm_source=ig_web_copy_link
10. Summer Early Enrichment in Engineering for Dean's Scholars presenter September 2020
    - Gave a 2-h presentation to University of Washington freshman about my lab's research interests and opportunities as an environmental engineer
11. Garfield High School Black Lives Matter Week interview February 2019
    - Recorded a 10-min video describing my experiences as a Black female professor and scientist to be shared with Adrian Dowst—a Chemistry teacher at Garfield High School (Seattle, WA)—to present to students during the Black Lives Matter Week

International, national or governmental service

- NSF Interfacial Engineering program, ad hoc proposal reviewer, January 2024
- NSF Broadening Participation in Engineering Center for Equity in Engineering Phase 1 Virtual Site Visit panelist, January 2024
- NSF Environmental Engineering 1440 Unsolicited Proposal panelist, October 2023
- External Examiner for Agriculture, Food and Environment Doctoral thesis, Hebrew University of Jerusalem, July 2023
- External Examiner for a Civil Engineering Master Program Masters Thesis, United Arab Emirates University, October 2022
- NSF Environmental Engineering 1440 Unsolicited Proposal panelist, March 2022
- NSF special workshop: "Participatory design meetings for smartphone survey app development", May 2021
- NSF Environmental Engineering 1440 ERASE PFAS proposal panelist, June 2021
- NSF Environmental Engineering 1440 Unsolicited Proposal panelist, January 2021
- US-Israel Binational Agricultural Research and Development Fund reviewer, January 2021
- NSF Engineering Research to Advance Solutions for Environmental PFAS (ERASE-PFAS) panelist, June 2020
- Stanford University SLAC National Accelerator Laboratory user proposal reviews