

Sherri M. Cook

Personal Information

Assistant Professor, Environmental Engineering Program
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Academic and Professional Background

Education

University of Michigan	Environmental Engineering	Ph.D.	2014
University of Michigan	Environmental Engineering	M.S.E.	2009
Virginia Tech (VPI&SU)	Civil Engineering (environmental focus)	B.S.	2008

Professional Experience

Assistant Professor, University of Colorado Boulder, Boulder, CO 8/2014 – Present

My research focuses on developing quantitative sustainable design methodologies and applying them to improve technology design, selection, and implementation, especially for projects on water reuse, sanitation, and resource recovery from waste. I use experimentation, process modeling, qualitative methods, and life cycle analyses. I teach a graduate course on wastewater treatment (biological processes) and undergraduate and graduate sustainability methodologies courses, which I developed three new courses focused on sustainability principles and associated technical skills.

Co-Founder, Prometheus Materials, Inc., Boulder, CO 4/2021 – Present

I co-founded and advise this start-up company, which has secured series A funding. The technologies use biological processes to generate carbon-neutral concrete alternatives and was developed during a collaborative research project that resulted in 3 inventions (patents filed).

Doctoral Researcher, University of Michigan, Ann Arbor, MI 8/2008 – 5/2014

My doctoral dissertation (*Analysis-Driven Sustainable Design of Waste Management Systems for Unused Medications & Wastewater Solids*) was supported by four fellowships, and my committee included: Skerlos, Love, Raskin, and Martens. I co-instructed a graduate course on wastewater treatment and helped develop and teach two undergraduate service-learning courses focused on an international development project, funded by EPA P3 and UofM's multidisciplinary design minor.

Undergraduate Research Assistant, Clarkson University, Potsdam, NY 5/2007 – 8/2007

My independent project focused on the evaluation of colloid concentration effects on natural media filtration efficiency for stormwater treatment. Supervised by Grimberg and Holsen.

Undergraduate Research Assistant, Virginia Tech, Blacksburg, VA 10/2005 – 8/2006

My independent project focused on the investigation of using additives to enhance anaerobic digestion and reduce biosolids cake odor. Supervised by Novak.

Intern, Froehling & Robertson, Sterling VA 5/2005 – 8/2005

My responsibilities included laboratory testing and in-field quality assessments of construction materials and data collection for environmental inspections.

Awards and Honors

- 2022 CU-Boulder Provost's Faculty Achievement Award
- 2021-2026 National Science Foundation Faculty Early Career Development Award
- 2018-2026 CU-Boulder Bennett-Lindstedt Faculty Fellowship
- 2019 CU-Boulder EVEN Faculty Appreciation Award (selected by B.S. students)
- 2018 CU-Boulder CEAE Young Researcher Award
- 2018 Virginia Tech CEE Outstanding Young Alumni
- 2010-2013 University of Michigan Graham Sustainability Institute Doctoral Fellow
- 2009-2012 National Science Foundation Graduate Research Fellow
- 2008-2009 Phi Kappa Phi Honor Society National Fellow
- 2008 Virginia Tech College of Engineering Outstanding Senior
- 2007 and 2006 Udall Foundation National Undergraduate Scholar

Publications

Notation: Cook's name is **bolded**, underline denotes Cook's graduate student, double underline denotes Cook's postdoctoral scholar, * denotes corresponding author.

Author order: Typical in my field is that principal investigator is last (when there are multiple PI, PIs are listed at the end in order of increasing contribution); for other authors, those that contributed the most are near the front of the author list.

Peer-Reviewed Journal Articles

- [1] Li, Y.; Trimmer, J.T.; Hand, S.; Zhang, X.; Chambers, K.G.; Lohman, H.A.C.; Shi, R.; Byrne, D.M.; **Cook, S.M.**; Guest, J.S.* Quantitative Sustainable Design (QSD) for the Prioritization of Research, Development, and Deployment of Technologies: A Tutorial and Review. *Environmental Science: Water Research & Technology* (2022), 8, 2439-2465. <https://doi.org/10.1039/D2EW00431C>
- [2] Chambers, K.G.; Sheridan, P.M.; **Cook, S.M.*** Sanitation Criteria: A Comprehensive Review of Existing Sustainability and Resilience Evaluation Criteria for Sanitation Systems. *Environmental Science & Technology Letters* (2022), 9, 7, 583–591. <https://pubs.acs.org/doi/full/10.1021/acs.estlett.2c00267>
- [3] Peterson, E.*; Johnson, S.R.; Shiokari, S.; Yun, Y.; **Cook, S.M.**; Summers, R.S. Impacts of Carbon-Based Advanced Treatment Processes on Disinfection Byproduct Formation and Speciation for Potable Reuse. *Water Research* (2022), 220, 118643. <https://doi.org/10.1016/j.watres.2022.118643>
- [4] Bentley, M.; Solomon, M.E.; Marten, B.; Shimabuku, K.K.; **Cook, S.M.*** Evaluating landfill leachate treatment by organic municipal solid waste-derived biochar. *Environmental Science: Water Research & Technology* (2021), 7, 2064-2074. <https://doi.org/10.1039/D1EW00376C>
- [5] Chambers, K.G.; Carrico, A.; **Cook, S.M.*** Drivers of sustained sanitation access: social network and demographic predictors of latrine reconstruction after flooding disasters. *Environmental Science: Water Research & Technology* (2021), 7, 1861-1872. <https://doi.org/10.1039/D1EW00263E>
- [6] Qui, J.; Artier, J.; **Cook, S.M.**; Srubar, W.V.; Cameron, J.*; Hubler, M.* Engineering Living Building Materials for Enhanced Bacterial Viability and Mechanical Properties. *iScience* (2021), 24 (2), 102083. <https://doi.org/10.1016/j.isci.2021.102083>
- [7] Summers, R.S.*; Shiokari, S.T.; Johnson, S.R.; Peterson, E.; Yun, Y.; **Cook, S.M.** Reuse treatment with ozonation, biofiltration and activated carbon adsorption for TOC control and DBP regulation compliance. *AWWA Water Science* (2020), 2 (5), e1190. <https://awwa.onlinelibrary.wiley.com/doi/10.1002/aws2.1190>

- [8] Thompson, K.A.*; Valencia, E.; Summers, R.S.; **Cook, S.M.** Sorption, coagulation, and biodegradation for greywater reuse. *Water Science & Technology* (2020), 81 (10), 2152–2162. <https://doi.org/10.2166/wst.2020.273>
- [9] Trimmer, J.T.*; Miller, D.C.; Byrne, D.M; Lohman, H.A.C.; Banadda, N; Baylis, K.; **Cook, S.M.**; Cusick, R.D.; Jjuuko, F.; Margenot, A.J.; Zerai, A.; Guest, J.S.* Re-envisioning sanitation as a human-derived resource system. *Environmental Science & Technology* (2020), 54 (17), 10446–10459. <https://pubs.acs.org/doi/10.1021/acs.est.0c03318>
- [10] Welsh-Huggins, S.; Liel, A.*; **Cook, S.M.** Reduce, Reuse, Resilient? Life-cycle seismic and environmental performances of buildings with alternative concretes. *Journal of Infrastructure Systems* (2020), 26 (1), 04019033. [https://doi.org/10.1061/\(ASCE\)IS.1943-555X.0000510](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000510)
- [11] Heveran, C.M.; Williams, S.L.; Qui, J.; Artier, J.; Hubler, M.; **Cook, S.M.**; Cameron, J.; Srubar, W.V.* Biomineralization and Successive Regeneration of Engineered Living Building Materials. *Matter* (2020). DOI: 10.1016/j.matt.2019.11.016. [https://www.cell.com/matter/fulltext/S2590-2385\(19\)30391-1](https://www.cell.com/matter/fulltext/S2590-2385(19)30391-1)
- [12] Liang, L.; Lui, R.; Foster, K.E.O.; **Cook, S.M.**; Cameron, J.C.; Srubar, W.V.; Gill, R.T.* Genome engineering of *E. coli* for improved styrene tolerance and production. *Metabolic Engineering* (2019), 57, 74-84. <https://doi.org/10.1016/j.ymben.2019.09.007>
- [13] Heveran, C.M., Liang, L.; Nagarajan, A.; Hubler, M.; Gill, R.; Cameron, J.; **Cook, S.M.**, Srubar, W.V.* Engineered ureolytic microorganisms can tailor the morphology and nanomechanical properties of microbial-precipitated calcium carbonate. *Scientific Reports* (2019), 9, 14721. <https://www.nature.com/articles/s41598-019-51133-9>
- [14] Davis, A.L.; Javernick-Will, A.; **Cook, S.M.*** Analyzing sanitation sustainability assessment frameworks for resource-limited communities. *Environmental Science & Technology* (2019), 53 (22), 13535-13545. <https://pubs.acs.org/doi/10.1021/acs.est.9b03134>
- [15] Davis, A.L.; Javernick-Will, A.*; **Cook, S.M.** Identifying pathways to successful sanitation interventions in resource limited communities using qualitative comparative analysis. *Science of the Total Environment* (2019), 663, 507-517. <https://doi.org/10.1016/j.scitotenv.2019.01.291>
- [16] Davis, A.L.; Javernick-Will, A.; **Cook, S.M.*** Priority Addressment Protocol: Understanding the Ability and Potential of Sanitation Systems to Address Priorities. *Environmental Science & Technology* (2019), 53 (1), 401-411. <https://pubs.acs.org/doi/10.1021/acs.est.8b04761>
- [17] Jones, C.H., Meyer, J., Cornejo, P.K., Hogrewe, W., Seidel, C.; **Cook, S.M.*** A new framework for small drinking water plant sustainability support and decision-making. *Science of the Total Environment* (2019), 695, 133899. <https://doi.org/10.1016/j.scitotenv.2019.133899>
- [18] Davis, A.L.; Javernick-Will, A.; **Cook, S.M.*** A Comparison of Interviews, Focus Groups, and Photovoice to Identify Sanitation Priorities and Increase Success of Community-based Sanitation Systems. *Environmental Science: Water Research & Technology* (2018), 4, 1451-1463. <http://pubs.rsc.org/en/content/articlelanding/2018/ew/c8ew00391b>
- [19] Jones, C.H.; Terry, L.G.; Summers, R.S.; **Cook, S.M.*** Environmental Life Cycle Comparison of Conventional and Biological Filtration Alternatives for Drinking Water Treatment. *Environmental Science: Water Research & Technology* (2018), 4, 1464-1479. <http://pubs.rsc.org/en/content/articlelanding/2018/ew/c8ew00272j>

- [20] Jones, C.H.; Shilling, E.; Linden, K.; **Cook, S.M.*** Life Cycle Environmental Impacts of Disinfection Technologies Used in Small Drinking Water Systems. *Environmental Science & Technology* (2018), 52 (5), 2998–3007. <https://pubs.acs.org/doi/10.1021/acs.est.7b04448>
- [21] Leow, S.; Shoener, B.D.; Li, Y.; Debellis, J.L.; Markham, J.; Davis, R.; Laurens, L.M.L.; Pienkos, P.T.; **Cook, S.M.**; Strathmann, T.J.; Guest, J.S.* A Unified Modeling Framework to Advance Biofuel Production from Microalgae. *Environmental Science & Technology* (2018), 52 (22), 13591–13599. <https://pubs.acs.org/doi/10.1021/acs.est.8b03663>
- [22] Keshavarzmohammadian, A.*; **Cook, S.M.**; Milford, J.B. Cradle-to-gate Environmental Impacts of Sulfur-based Solid-state Lithium Batteries for Electric Vehicle Applications. *Journal of Cleaner Production* (2018), 202, 770-778. <https://doi.org/10.1016/j.jclepro.2018.08.168>
- [23] Liang, L.; Heveran, C.; Liu, R.; Gill, R.; Nagarajan, A.; Cameron, J.; Hubler, M.; Srubar, W.V.; **Cook, S.M.*** Rational Control of Calcite Precipitation by Engineered *Escherichia coli*. *ACS Synthetic Biology* (2018), 7 (11), 2497–2506. <https://pubs.acs.org/doi/10.1021/acssynbio.8b00194>
- [24] Thompson, K.A.; Summers, R.S.; **Cook, S.M.*** Development and experimental validation of the composition and treatability of a new synthetic bathroom greywater (SynGrey). *Environmental Science: Water Research & Technology* (2017), 3, 1120-1131. <http://pubs.rsc.org/en/content/articlelanding/2017/ew/c7ew00304h>
- [25] Byrne, D.M.; Lohman, H.A.C.; **Cook, S.M.**; Peters, G.M.; Guest, J.S.* Life cycle assessment (LCA) of urban water infrastructure: Emerging approaches to balance objectives and inform comprehensive decision-making. *Environmental Science: Water Research & Technology* (2017), 3, 1002-1014. <http://pubs.rsc.org/en/content/articlelanding/2017/ew/c7ew00175d>
- [26] Thompson, K.A.; Shimabuku, K.K.; Kearns, J.P.; Knappe, D.R.U.; Summers, R.S.; **Cook, S.M.*** Environmental comparison between biochar and activated carbon for tertiary wastewater treatment. *Environmental Science & Technology* (2016), 50 (20), 11253-11262. <http://pubs.acs.org/doi/full/10.1021/acs.est.6b03239>
- [27] **Cook, S.M.**; Skerlos, S.J.▲; Raskin, L.; Love, N.G.▲* The establishment of a stability algorithm for anaerobic codigestion. *Water Research* (2017), 117, 19-28. <http://dx.doi.org/10.1016/j.watres.2017.01.027> (▲denotes Cook's PhD advisors)
- [28] **Cook, S.M.**; VanDuinen, B.J.; Love, N.G.▲; Skerlos, S.J.▲* Life cycle comparison of environmental emissions from three disposal options for unused pharmaceuticals. *Environmental Science & Technology* (2012), 46 (10), 5535-5541. <http://pubs.acs.org/doi/full/10.1021/es203987b>

Submitted and Under Review Journal Articles

- [29] Peterson, E.*; Summers, R.S.; **Cook, S.M.** Control of Pre-formed Halogenated Disinfection Byproducts with Reuse Biofiltration. Under Review at *Environmental Science & Technology*.
- [30] Lohman, H.A.C.; Morgan, V.L.; Li, Y.; Zhang, X.; Rowles, L.S.; **Cook, S.M.**; Guest, J.S.* DMSan: A multi-criteria decision analysis framework and package to characterize contextualized sustainability of sanitation and resource recovery technologies. Under Review at *ACS Environmental Au*.

Anticipated Peer-Reviewed Journal Articles (In Preparation)

- [31] Marten, B.; **Cook, S.M.*** Evaluating the Sustainability of a Novel Circular Economy Waste Management Strategy. In preparation for submission to *Environmental Science & Technology*.

- [32] Chambers, K.G.; **Cook, S.M.*** Changes to reconstruction decisions following repeated failure and reconstruction in flood-affected households. In preparation for submission to *Environmental Science & Technology*.

Book Chapters

- [1] Jones, R.J; Delesky, E.A.; **Cook, S.M.**; Cameron, J.C.; Hubler, M.H.; Srubar, W.V. Engineered Living Materials for Construction. *Engineered Living Materials* (2022), 187-216.

Conference Proceedings

- [1] Peterson, E.[†]; Shiokari, S.; Johnson, S.; Yu, Y.; Summers, R.S.; **Cook, S.M.** Evaluating disinfection byproduct regulations for limiting human health risk after ozone-biofiltration-GAC treatment for potable reuse. *Proceedings of the IWA Water Reuse Conference*, 6 pgs, Berlin, Germany, June 2019.
- [2] Keshavarzmohammadian, A.; Milford, J.B; **Cook, S.M.**[†] Impacts of Power Generation Technology Choices on Life Cycle Water Consumption. *Proceedings of the Life Cycle Assessment XVIII Conference*, 4 pgs, Fort Collins, CO, September, 2018.
- [3] Davis, A.L.[†]; Javernick-Will, A.; **Cook, S.M.** Avoiding Failure: The Use of Qualitative Comparative Analysis to Identify Pathways to Successful Sanitation Interventions. *Proceedings of the Engineering Project Organization Conference*, 25 pgs, Brijuni, Croatia, June 2018.
- [4] Kikale, P.[†]; Kumar, P.; **Cook, S.M.** Integrated solutions for water reuse and resource recovery: comparing and identifying sustainable water reuse treatment options. *Proceedings of the IWA Water Reuse Conference*, 8 pgs, Long Beach, CA, July 2017.
- [5] Davis, A.L.[†]; Javernick-Will, A.; **Cook, S.M.** Multi-Method Approach to Identify Community Priorities for Sanitation Systems. *Proceedings of the Engineering Project Organization Conference*, 19 pgs, Lake Tahoe, CA, June 2017.
- [6] Guest, J.S.[†]; **Cook, S.M.**; Skerlos, S.J.[▲]; Love, N.G.[▲] A methodology to assess the environmental impacts of upgrading wastewater infrastructure: A case study to evaluate energy recovery from black water. *Proceedings of the WEF Technical Exhibition & Conference*, 19 pgs, Orlando, FL, Oct. 2009.
- [7] **Cook, S.M.**[†]; Guest, J.S.; Skerlos, S.J.[▲]; Love, N.G.[▲] Environmental characteristics of different energy recovery systems from the management of sewage sludge and food waste. *Proceedings of the IWA Sludge Conference*, 8 pgs, Harbin, China, August 2009.

Conference Oral Presentations

Notation: [†] denotes presenter, underline denotes graduate student, double underline denotes postdoctoral scholar, [▲] denotes Cook's PhD or undergraduate research advisors.

- [1] Marten, B.[†]; **Cook, S.M.** Evaluating the Sustainability of a Novel Circular Economy Waste Management Strategy. *AEESP Education and Research Conference*, St. Louis, MO. June, 2022.
- [2] Marten, B.[†]; **Cook, S.M.** A Novel and Sustainable Circular Economy Waste Management Strategy. *Global Waste Management Symposium*, Indian Wells, CA. February, 2022.
- [3] Oden, C.[†]; D'souza, M.; **Cook, S.M.** Decision support tool combining economic, environmental, and social considerations for the removal of PFAS in water. *AWWA Water Quality and Technology Conference*, Tacoma, WA, November, 2021.

- [4] Peterson, E.[†]; Yun, Y.; Bell, K.; **Cook, S.M.**; Summers, R.S. Effects of Pre-Chlorination on Regulated and Non-Regulated DBP Control with Carbon Based Advanced Treatment. *AWWA Water Quality and Technology Conference*, Tacoma, WA, November, 2021.
- [5] Oden, C.[†]; D'souza, M.; **Cook, S.M.** Enabling the use of LCA to improve water quality: A comparison of activated carbon and anion exchange treatment options for PFAS-contaminated water. *American Center for Life Cycle Assessment Conference*, Virtual, September, 2021.
- [6] Marten, B.[†]; **Cook, S.M.** Evaluating the Sustainability of a Novel Circular Economy Waste Management Strategy. *American Center for Life Cycle Assessment Conference*, Virtual, September, 2021.
- [7] Oden, C.[†]; D'souza, M.; **Cook, S.M.** Decision support tool for sustainable treatment selection for the management of PFAS in water. *American Chemical Society Fall National Meeting and Expo*, Virtual, August, 2021.
- [8] Peterson, E.[†]; **Cook, S.M.**, Summers, R.S. Treatment of forty pre-formed halogenated disinfection byproducts with biofiltration for potable reuse. *American Chemical Society Fall National Meeting and Expo*, Virtual, August, 2021.
- [9] Oden, C.[†]; D'souza, M.; **Cook, S.M.** Developing a decision support tool for PFAS water treatment. *International Conference on Resource Sustainability*, Virtual, July, **2021**.
- [10] Jones, C.H.[†]; **Cook, S.M.** A Demonstration of a Decision-Support Tool's Usefulness for Improving Decision-Making Under Uncertain Conditions. *AWWA Annual Conference & Exposition*, Virtual, June, 2021.
- [11] Oden, C.[†]; D'souza, M., **Cook, S.M.** Decision Support Tool Combining Economic, Environmental, and Social Considerations for the Treatment of PFAS in Groundwater. *American Chemical Society Spring National Meeting and Expo*, Virtual, April, 2021.
- [12] Guest, J.S.[†]; Trimmer, J.T.; Hand, S.; Li, Y.; Byrne, D.M.; Chambers, K.; Lohman, H.A.C.; Shi, R.; Zhang, X.; **Cook, S.M.** Quantitative Sustainable Design (QSD): A methodology for the prioritization of technology research, development, and deployment. *American Chemical Society Spring National Meeting and Expo*. April, 2021.
- [13] Marten, B.M.[†]; Butler, C.; **Cook, S.M.**[†] An Economic and Environmental Evaluation of a Novel Circular Economy Waste Management Strategy. *International Conference on Solid Waste Technology and Management*, Virtual, March 2021.
- [14] Oden, C.[†]; D'souza, M.; **Cook, S.M.** Decision Support Tool Combining Economic, Environmental, and Social Considerations for the Treatment of PFAS in Groundwater. *American Water Works Association Virtual Summit*, Virtual, February, 2021.
- [15] Peterson, E.[†]; Shiokari, S.; Johnson, S.; Yu, Y.; **Cook, S.M.**; Summers, R.S. Evaluating Disinfection Byproduct Regulations for Limiting Human Health Risk after Ozone-Biofiltration-GAC Treatment for Potable Reuse. *WaterReuse Symposium*, Virtual, Denver, CO, August, 2020.
- [16] Summers, R.S.; Shiokari, S.; Johnson, S.; Peterson, E.[†]; Yu, Y.; **Cook, S.M.** Organic carbon removal and DBP control by coagulation, biofiltration and GAC adsorption. *WaterReuse Symposium*, Denver, CO, Virtual, August, 2020.

- [17] Jones, C.H.[†]; **Cook, S.M.** A Demonstration of a Decision-Support Tool's Usefulness for Improving Decision-Making Under Uncertain Conditions. *AWWA Annual Conference & Exposition*, Orlando, FL, June 2020. *Canceled due to pandemic.*
- [18] Summers, R.S.[†]; Peterson, E.; Yu, Y.; Shiokari, S.; Johnson, S.; **Cook, S.M.** A Bench-Scale Approach for Evaluating the Treatability of Municipal Wastewater Effluent for Organic Carbon Removal and DBP Control. *AWWA International Symposium on Potable Reuse*, Atlanta, Georgia, February 2020.
- [19] Chambers, K.G.[†]; Carrico, A.; **Cook, S.M.** Latrine Reconstruction Decisions and Predictors in Flood-affected Households in Ethiopia. *UNC Water & Health Conference*. Chapel Hill, NC, October 2019.
- [20] Srubar, W.V.[†]; Heveran, C.M.; Williams, S.; Liang, L.; Nagarajan, A.; **Cook, S.M.**; Hubler, M.; Cameron, J. Genetically Engineered Cementitious Composites. *American Concrete Institute Fall Convention*, Cincinnati, Ohio, October 2019.
- [21] Peterson, E.[†]; Shiokari, S.; Johnson, S.; Yu, Y.; Summers, R.S.; **Cook, S.M.** Evaluating disinfection byproduct regulations for limiting human health risk after ozone-biofiltration-GAC treatment for potable reuse. *IWA Water Reuse Conference*, Berlin, Germany, July 2019.
- [22] Williams, S.[†]; Artier, J.; Qui, J.; Heveran, C.M.; Hubler, M.; **Cook, S.M.**; Cameron, J.; Srubar, W.V. Regenerative Hydrogel-Based Living Microbial Mortars: Investigation of Viability and Strength in Successive Material Generations. *International Conference on Bio-based Building Materials*, Belfast, U.K., June 2019.
- [23] Williams, S.; Qui, J.; Artier, J.; Heveran, C.M.; **Cook, S.M.**; Cameron, J.; Hubler, M.; Srubar, W.V.[†] Investigating the Successive Regeneration of Hydrogel-based Microbial Mortars. *2019 ASCE Engineering Mechanics Institute Conference*. Pasadena, CA, June 2019.
- [24] Solomon, M.[†]; Bentley, M.; **Cook, S.M.** Generating Novel Biochar Adsorbents from Landfill-Bound Waste Materials for Removal of Organic Contaminants in Landfill Leachate. *USBI Biochar Conference*, Fort Collins, CO, June, 2019.
- [25] Jones, C.H.[†]; **Cook, S.M.** Making a Treatment Decision with the Future in Mind: How Regulation and Source Water Effect Cost and Environmental Impacts. *AWWA Annual Conference & Exposition*, Denver, CO, June 2019.
- [26] Peterson, E.[†]; **Cook, S.M.**, Summers, R.S. A Systematic Bench-Scale Evaluation of Effluent Organic Matter Removal with Biofiltration for Potable Reuse Systems. *AWWA Annual Conference & Exposition*, Denver, CO, June 2019.
- [27] Peterson, E.[†]; Shiokari, S.; Johnson, S.; Yu, Y.; **Cook, S.M.**; Summers, R.S. Control of Disinfection Byproduct-Associated Risk by Ozonation, Biofiltration, and Adsorption for Wastewater Potable Reuse. *AWWA Annual Conference & Exposition*, Denver, CO, June 2019.
- [28] Solomon, M.[†]; Bentley, M.; **Cook, S.M.** Landfill Waste Biochar Adsorbents for Organic Contaminant Removal in Landfill Leachate. *Rocky Mountain Section AWWA & WEA Annual Conference*, Boulder, CO, May, 2019.
- [29] Jones, C.H.[†]; **Cook, S.M.** The Hidden Trade-offs Involved in Managing Limited Resources to Improve Water Quality. *AWWA Water Quality Technology Conference*, Toronto, ON, November, 2018.

- [30] Davis, A.L.[†]; Javernick-Will, A.J.; **Cook, S.M.** Why do sanitation systems still not address user priorities? *UNC Water & Health Conference*. Chapel Hill, NC, October 2018.
- [31] Chambers, K.G.[†]; Carrico, A.; **Cook, S.M.** Social Network Patterns of Latrine Re-adoption Following Flood Events. *UNC Water & Health Conference*. Chapel Hill, NC, October 2018.
- [32] Jones, C.H.[†]; **Cook, S.M.** A Life Cycle Comparison of Small Drinking Water Treatment Alternatives. *Life Cycle Assessment XVIII*, Fort Collins, CO, September, 2018.
- [33] Nagarajan, A.[†]; Liang, L.; Heveran, C.M.; Gill, R.; Hubler, M.; Srubar, W.V.; **Cook, S.M.**; Cameron, J.; Calcite production for building biohybrid living structural material from the cyanobacterium *Synechococcus* sp. PCC 7002. *Synthetic Biology: Engineering, Evolution & Design (SEED)*. Scottsdale, AZ, June 2018.
- [34] Davis, A.L.[†]; Javernick-Will, A.; **Cook, S.M.** Avoiding Failure: The Use of Qualitative Comparative Analysis to Identify Pathways to Successful Sanitation Interventions. *Engineering Project Organization Conference*, Brijuni, Croatia, June 2018.
- [35] Heveran, C.M.[†]; Liang, L.; Nagarajan, A.; **Cook, S.M.**; Cameron, J.; Gill, R.; Hubler, M.; Srubar, W.V. Engineered living building materials: multiscale mechanics of biogenic calcite from genetically modified bacteria. *Engineering Mechanics Institute*. Boston, MA, May 2018.
- [36] Chambers, K.G.[†]; **Cook, S.M.** Sustainable and Resilient Sanitation Systems: Indicators, Tradeoffs, and Barriers. *Rocky Mountain Section AWWA & WEA Annual Conference*, Golden, CO, May 2018.
- [37] Jones, C.H.[†]; Terry, L.G.; Summers, R.S.; **Cook, S.M.** Biological Filtration Scenarios that Reduce Environmental Impacts. *Rocky Mountain Section AWWA & WEA Annual Conference*, Golden, CO, May 2018.
- [38] Terry, L.G.[†]; Jones, C.H.; **Cook, S.M.**; Summers, R.S. Impacts of Operational Parameters and Water Quality on Biofiltration for Potable Reuse Systems. *AWWA International Symposium on Biological Treatment*, Austin, TX, January 2018.
- [39] Jones, C.H.[†]; Shilling, E.; Linden, K.; **Cook, S.M.** Decision Support for Small Systems: A Comparative Environmental Impact Assessment of Chlorine and UV Disinfection Alternatives. *AWWA Water Quality Technology Conference*, Portland, OR, November 2017.
- [40] Davis, A.L.[†]; Javernick-Will, A.J.; **Cook, S.M.** Avoiding Failure: The Use of Qualitative Comparative Analysis to Identify Pathways to Successful Sanitation Interventions. *UNC Water & Health Conference*. Chapel Hill, NC, October 2017.
- [41] Chambers, K.G.[†]; **Cook, S.M.** A Comparative Sanitation Infrastructure Analysis Evaluating Resilience, Community Priorities, and Sustainability Tradeoffs. *UNC Water & Health Conference*. Chapel Hill, NC, October 2017.
- [42] Nagarajan, A.[†]; Liang, L.; Heveran, C.M.; Gill, R.; Hubler, M.; Srubar, W.V. Cameron, J.; **Cook, S.M.** Cyano-Calcite production for building living structural materials. *Annual Midwest Southeast Photosynthesis Conference*. Turkey Run, IN, October 2017.
- [43] Kikale, P.[†]; Kumar, P.; **Cook, S.M.** Integrated solutions for water reuse and resource recovery: comparing and identifying sustainable water reuse treatment options. *IWA Water Reuse Conference*, Long Beach, CA, July 2017.

- [44] Davis, A.L.; Javernick-Will, A.J.; **Cook, S.M.**[†] Identifying Community Priorities to Develop Appropriate Sanitation and Resource Recovery Systems and Interventions. *AEESP Education and Research Conference*, Ann Arbor, MI, June 2017.
- [45] Terry, L.G.[†]; Jones, C.H.; Summers, R.S.; **Cook, S.M.** Environmentally Sustainable Scenarios for Biological Filtration Compared to Rapid Media Filtration. *AWWA Annual Conference & Exposition*, Philadelphia, PA, June 2017.
- [46] Cornejo, P.K.; Hogrewe, W.[†]; **Cook, S.M.**; Seidel, C.; Malley, J. A Multi-Criteria Decision Analysis Framework for Small Systems. *AWWA Annual Conference & Exposition*, Philadelphia, PA, June 2017.
- [47] Davis, A.L.[†]; Javernick-Will, A.J.; **Cook, S.M.** Multi-Method Approach to Identify Community Priorities for Sanitation Systems. *Engineering Project Organization Conference (EPOC)*, Lake Tahoe, CA, June 2017.
- [48] Terry, L.G.[†]; Jones, C.H.; **Cook, S.M.**; Summers, R.S. Evaluation of Extended EBCT Biofilters for Small Systems Based on Biomass Development and Distribution. *AWWA Water Quality Technology Conference & Exhibition*, Indianapolis, IN, November 2016.
- [49] Davis, A.L.[†]; Javernick-Will, A.J.; **Cook, S.M.** Priorities for Sanitation and Energy Systems in Resource-Limited Communities. *UNC Water & Health Conference*. Chapel Hill, NC, October 2016.
- [50] Leow, S.; Shoener, B.D.; Li, Y.; DeBellis, J.L.; Davis, R.; Laurens, L.M.L.; Nagle, N.; Pienkos, P.T.; **Cook, S.M.**; Strathmann, T.J; Guest, J.S.[†] Systems-scale optimization of the integrated microalgae-biofuel process applying various downstream aqueous conversion technologies. *Algae Biomass Organization Algal Biomass Summit*, Phoenix, AZ, October 2016.
- [51] Cornejo, P.K.[†]; Hogrewe, W.; **Cook, S.M.**; Jones, C.H.; Meyer, J. A sustainability framework for small systems: Multi-criteria decision analysis to evaluate drinking water treatment systems. *International Congress of Sustainability Science & Engineering*, Suzhou, China, October 2016.
- [52] Thompson, K.A.[†]; Shimabuku, K.T.; Kearns, J.P., Knappe, D.R.U.; Summers, R.S; **Cook, S.M.** An environmental comparison between powdered activated carbon and biochar for tertiary wastewater treatment. *USBI Biochar Conference*, Corvallis, OR, August 2016.
- [53] Cornejo, P.K.[†]; Jones, C.H.; Hogrewe, B.; **Cook, S.M.** Improving Decision Support for Small Drinking Water Systems: An Innovative Approach to Alternatives Assessment. *AWWA Annual Conference & Exposition*, Chicago, IL, June 2016.
- [54] Jones, C.H.[†]; Shilling, E.; **Cook, S.M.** Sustainability Comparison of Innovative and Conventional Treatment Technologies for Small Systems. *Rocky Mountain Section AWWA & WEA Annual Conference*, Laramie, WY, May 2016.
- [55] Thompson, K.A.[†]; Shimabuku, K.T.; Kearns, J.P., Knappe, D.R.U.; Summers, R.S; **Cook, S.M.** An environmental comparison between powdered activated carbon and biochar for tertiary wastewater treatment. *Rocky Mountain Section AWWA & WEA Annual Conference*, Laramie, WY, May 2016.
- [56] Shilling, E.; Linden, K.; **Cook, S.M.**[†] A Comparison of Life Cycle Environmental Emissions from Disinfection Technologies for Small Drinking Water Systems. *AEESP Education and Research Conference*, New Haven, CT, June 2015.

- [57] Shilling, E.[†]; Linden, K.; **Cook, S.M.** Sustainable Solutions for Small Water Systems: An Environmental Assessment Framework and Its Application to Drinking Water Disinfection Technologies. *AWWA Annual Conference & Exposition*, Anaheim, CA, June 2015.
- [58] Shilling, E.[†]; Linden, K.; **Cook, S.M.** An Environmental Assessment Framework and Its Application to Drinking Water Disinfection Technologies. *Rocky Mountain Section AWWA & WEA Annual Conference*, Las Cruces, NM, May 2015.
- [59] Shilling, E.; Linden, K.; **Cook, S.M.**[†] Sustainable Solutions for Small Water Systems: A Comparison of the Life Cycle Environmental Emissions of Conventional & Innovative Technologies. *Engineering Sustainability Conference*, Pittsburgh, PA, April 2015.
- [60] Shilling, E.; Linden, K.; **Cook, S.M.**[†] Sustainable Solutions for Small Water Systems: An Environmental Assessment Framework and Its Application to Drinking Water Disinfection Technologies. *IWA Conference on Water Efficiency and Performance Assessment of Water Services*, Cincinnati, Ohio, April 2015.
- [61] **Cook, S.M.**[†]; Skerlos, S.J.[▲]; Love, N.G.[▲] Resource Recovery from Waste: A Design-oriented Analysis of Anaerobic Co-digestion Stability. *Borchardt Conference*. Ann Arbor, MI, Feb. 2014.
- [62] **Cook, S.M.**[†]; Love, N.G.[▲] A Regional Strategy for Managing Food Processing and Septage Waste: The Grand Traverse Region Collaboration. *Biogas Summit*, Flint, MI, October 2010.
- [63] **Cook, S.M.**[†]; Guest, J.S.; Christianson, M.G.; Love, N.G.[▲]; Skerlos, S.J.[▲] Energy Recovery from Wastewater: Evaluation of Resource Management Alternatives for Appropriate & Environmentally Sustainable Energy Production. *Engineering Sustainability Conference*, Pittsburgh, PA, April 2009.
- [64] **Cook, S.M.**[†]; Jaradat, A.Q.; Grimberg, S.J.[▲]; Holsen, T.M.[▲] Sustainable Stormwater Treatment: Colloid Concentration Effect on Natural Media Filtration Efficiency. *American Society of Civil Engineers' 2008 Virginias' Student Conference*, Summersville, WV, April 2008.
- [65] **Cook, S.M.**[†]; Novak, J.T.[▲] Sustainable Wastewater Treatment: Investigation of Chemical, Enzymatic, and/or Biological Agents as Additives to Enhance Anaerobic Digestion and Reduce Biosolids Cake Odor. *ACC Undergraduate Research Conference*, Charlottesville, VA, April 2007.

Conference Poster Presentations

- [1] Ventura, R.[†]; Javernick-Will, A.; **Cook, S.** Identifying characteristics that lead to a perceived "modern" bathroom in the rural Peruvian context. *UNC Water & Health Conference*, Chapel Hill, NC, October 2022.
- [2] D'souza, M.[†]; Oden, C.; **Cook, S.M.** Comparison of PFAS Breakthrough Models for the Prediction of Usage Rates of Different Adsorption Media. *AEHS International Conference on Soils, Sediments, Water, and Energy*, Virtual, October, 2021.
- [3] Jones, C.H.[†]; **Cook, S.M.** Lessons Learned from Constructing a Small Systems Decision Support Tool: Insights for Large Systems. *AWWA Water Quality Technology Conference*, Dallas, TX, November 2019.
- [4] Artier, J.[†]; Qui, J.; Williams, S.; Hubler, M.; Srubar, W.V.; **Cook, S.M.**; Cameron, J. Improving Desiccation Tolerance In *Synechococcus* sp PCC 7002 Towards Regeneration of Biomaterials. *Synthetic Biology: Engineering, Evolution, and Design*. New York, NY, June 2019.

- [5] Artier, J.[†], Qui, J.; Williams, S.; White, R.; Hubler, M.; Srubar, W.V.; **Cook, S.M.**; Cameron, J. Improving Desiccation Tolerance In *Synechococcus* sp PCC 7002 Towards Regeneration of Biomaterials. *13th Workshop on Cyanobacteria*, Boulder, CO, June 2019.
- [6] Qui, J.[†]; Artier, J.; Williams, S.; Heveran, C.M.; **Cook, S.M.**; Cameron, J.; Srubar, W.V.; Hubler, M. A Novel Lightweight Gelatin-Based Composite Engaging Microbially Induced Calcite Precipitation for Infrastructure Applications. *ASCE Engineering Mechanics Institute*. Pasadena, CA, June 2019.
- [7] Keshavarzmohammadian, A.; Milford, J.B; **Cook, S.M.**[†] Impacts of Future Scenarios for Natural Gas Production and Use on Life Cycle Water Consumption. *Life Cycle Assessment XVIII*, Fort Collins, CO, September, 2018.
- [8] Solomon, M.[†]; Bentley, M.; **Cook, S.M.** Comparing the Performance of Biochar Generated from Landfill-Bound Organic Waste for the Treatment of Landfill Leachate. *Rocky Mountain Section AWWA & WEA Joint Annual Conference*, Denver, CO, September, 2018.
- [9] Heveran, C.M.[†], Liang, L.; Nagarajan, A.; Gill, R.; **Cook, S.M.**; Cameron, J.; Srubar, W.V. Microbial-Precipitated Calcite with Tunable Morphology and Robust Nanomechanical Properties for Living Building Materials. *World Congress of Biomechanics*. Dublin, Ireland, July 2018.
- [10] Heveran, C.M.[†], Liang, L.; Gevaudan, J.P.; Nagarajan, A.; Gill, R.; **Cook, S.M.**; Cameron, J.; Srubar, W.V. Multiscale Mechanics Of Biogenic Cements From Genetically Modifiable Bacteria For The Creation Of Living Building Materials. *ASCE Engineering Mechanics Institute Conference*. Boston, MA, May 2018.
- [11] Solomon, M.[†]; Bentley, M.; **Cook, S.M.** Impact of Landfill-Bound Feedstocks and Treatments on Biochar Adsorption for the Treatment of Landfill Leachate. *Rocky Mountain Section AWWA & WEA Annual Conference*, Golden, CO, May, 2018.
- [12] Thompson, K.A.[†]; Hill, C.; Summers, R.S.; **Cook, S.M.** Bench-scale Testing of Conventional Drinking Water Treatment of Wastewater Effluent, Stormwater, and Blends with Surface Water. *AWWA International Symposium on Potable Reuse*, Austin, TX, Jan 2018.
- [13] Thompson, K.A.[†]; Hill, C.; Summers, R.S.; **Cook, S.M.** Conventional Surface Water Treatment of Alternative Source Waters: Greywater, Stormwater, Wastewater Effluent and Blends Thereof. *AWWA Water Quality Technology Conference*, Portland, OR, November 2017.
- [14] Thompson, K.A.[†]; **Cook, S.M.**; Summers, R.S. The Evaluation of Activated Carbon and Novel Biochar Sorbents as Treatment Approaches for Meeting Greywater Reuse Regulations. *AWWA Water Quality Technology Conference*, Portland, OR, November 2017.
- [15] Jones, C.H.[†]; Cornejo, P.K.; Miller, W.; Hogrewe, W.; Seidel, C.; Meyer, J.; **Cook, S.M.** Small Systems Decision Tool: Methodology and Tool Development For Water Treatment Technology and Operational Decision-Making. *AWWA Water Quality Technology Conference*, Portland, OR, November 2017.
- [16] Thompson, K.A.; Summers, R.S.; **Cook, S.M.**[†] Treatment of Real and a New Synthetic Bathroom Greywater with Biochar Adsorption, Chlorination, and Biodegradation. *IWA Water Reuse Conference*, Long Beach, CA, July 2017.
- [17] Byrne, D.M.[†]; Lohman, H.A.C.[†]; **Cook, S.M.**; Peters, G.M.; Guest, J.S. Advancement of Life Cycle Assessment of Urban Water Infrastructure to Address the Local and Global Contexts of Environmental and Public Health. *AEEESP Education and Research Conference*, Ann Arbor, MI, June 2017.

- [18] Thompson, K.A.; **Cook, S.M.**[†]; Summers, R.S. Detailed Characterization of Real and Synthetic Bathroom Greywater to Support Development of Novel, Sustainable Greywater Reuse Treatment Technologies. *AEESP Education and Research Conference*, Ann Arbor, MI, June 2017.
- [19] Jones, C.H.[†]; **Cook, S.M.** Sustainability Comparison of Innovative and Conventional Filtration and Disinfection Technologies for Small Systems. *AWWA Water Quality Technology Conference & Exhibition*, Indianapolis, IN, November 2016.
- [20] Kilake, P.[†]; Kumar, P.; **Cook, S.M.** Comparison of Water Reuse Treatment Options to Maximize Resource Recovery from Wastewater. *Rocky Mountain Section AWWA & WEA Annual Conference*, Laramie, WY, May 2016.
- [21] **Cook, S.M.**[†]; Skerlos, S.J.[▲]; Love, N.G.[▲] A design-oriented stability analysis of anaerobic codigestion using ADM1. *IWA Wastewater Treatment Modeling*, Spa, Belgium, March 2014.
- [22] **Cook, S.M.**[†]; Skerlos, S.J.[▲]; Love, N.G.[▲] Modeling Anaerobic Co-digestion Performance and Reliability Under Varying Influent Compositions. *AEESP Education and Research Conference*, Golden, CO, July 2013.
- [23] **Cook, S.M.**[†]; Delgado Vela, J.; Stadler, L.G. Modeling Advancing the Success of Engineering Service Projects from the Classroom to the Field. *AEESP Education and Research Conference*, Golden, CO, July 2013.
- [24] **Cook, S.M.**[†]; VanDuinen, B.J.; Skerlos, S.J.[▲]; Love, N.G.[▲] Life Cycle Comparison of Environmental Impacts from Alternative Pharmaceutical Disposal Methods. *AEESP Education and Research Conference*, Tampa, FL, July 2011.
- [25] **Cook, S.M.**[†]; Love, N.G.[▲] Two-phase Anaerobic Co-digestion of Septage and Food Processing Waste: Designing a Reliable, Regional Waste Management Strategy. *IWA Leading-Edge Conference on Water and Wastewater Technologies*, Amsterdam, the Netherlands, June 2011.
- [26] Dorer, H.[†]; Hwang, J.[†]; Li, Z.[†]; Twill, K.[†]; Coir, E.[†]; Gupta, A.[†]; Frederick, T.[†]; Schulman, B.; Collins, M.; Nagel, A.; McCleary, E.; Bhandari, A.; Kaniz, N.; Sung, C.; **Cook, S.M.**[†]; Skerlos, S.J.[▲] Development of a Robust Anaerobic Biogas System for Use in Developing Countries. *National Sustainable Design Exposition*, Washington, D.C., April 2011.
- [27] **Cook, S.M.**[†]; VanDuinen, B.J.; Skerlos, S.J.[▲]; Love, N.G.[▲] Life Cycle Comparison of Environmental Impacts from Alternative Pharmaceutical Disposal Methods. *Engineering Sustainability Conference*, Pittsburgh, PA, April 2011.

Invited Presentations

Invited Seminar Presentations

- [1] *University of Minnesota*, Minneapolis, MN, December 2021.
- [2] *University of Massachusetts Amherst*, Amherst, MA, November 2021.
- [3] *Arizona State University*, Tempe, AZ, October 2021.
- [4] *North Carolina State University*, Raleigh, NC, October 2021.
- [5] *University of New Mexico*, Albuquerque, NM, September 2021.
- [6] *University of Illinois at Urbana-Champaign*, Urbana-Champaign, IL, September 2020.

- [7] *University of Texas at Austin*, Austin, Texas, February 2020.
- [8] *Colorado State University*, Fort Collins, Colorado, February 2020.
- [9] *University of Colorado Boulder Environmental Studies*, Boulder, Colorado, February 2019.
- [10] *Colorado School of Mines*, Golden, CO, February 2017.
- [11] *National Center for Atmospheric Research*, Boulder, CO, January 2017.
- [12] *Eawag Aquatic Research Institution*, Dübendorf, Switzerland, March 2016.

Conference and Professional Workshop Presentations

- [1] Guest, J.[†]; Byrne, D.[†]; Cusick, R.[†]; Tarpeh, W.[†]; **Cook, S.M.** Introducing Quantitative Sustainable Design (QSD) as a Structured Approach for Research and Education (competitively selected workshop presentation). *AEESP Research and Educational Conference*, St. Louis, MO, June 2022.
- [2] **Cook, S.M.**[†]; Knappe, D.[†]; Bellona, C.[†]; Ozekin, K.[†] Demonstration, Training, and Feedback on Decision Support Tool for Selecting and Operating Sustainable PFAS Treatment Technologies. *Expert Panel Feedback on Research Project*, Denver, CO, February 2022.
- [3] **Cook, S.M.**[†] Best Practices for Raising LCA Literacy Among Non-Practitioners (competitively selected workshop presentation). *American Center for Life Cycle Assessment Conference*, Virtual, September 2021.
- [4] **Cook, S.M.**[†] Linking Reuse Water Quality to Wastewater Treatment. *University of Colorado Boulder Water Reuse Short Course* (NYSED professional development hours), Virtual, March 2021.
- [5] **Cook, S.M.**[†]; Knappe, D.[†]; Bellona, C.[†]; Ozekin, K.[†]; Evaluation and Life Cycle Comparison of Ex-Situ Treatment Technologies for Poly- and Perfluoroalkyl substances in Groundwater. *Expert Panel Feedback on Research Project*, Denver, CO, February 2020.
- [6] Higgins, M.R.[†]; **Cook, S.M.**[†] Best Practices for Raising LCA Literacy Among Non-Practitioners (competitively selected workshop presentation). *American Center for Life Cycle Assessment Conference*, Fort Collins, CO, September 2018.
- [7] Jones, C.H.[†]; Davis, A.[†]; Hogrewe, B.; **Cook, S.M.**[†] Get a check on your gut check: Small water system treatment technology decision-support tool. *Rural Community Assistance Partnership National Training Conference*, New Orleans, LA, April 2018.
- [8] Shaw, A.[†]; Corominas, L.; **Cook, S.M.** Wastewater Treatment Life Cycle Assessments. *IWA Wastewater Treatment Modeling*, Annecy, France, April 2016.
- [9] **Cook, S.M.**[†] Modeling Energy Production: Codigestion Overview and ADM1. Part of the Workshop “How Can Modeling be Effectively Used for Energy Balance Optimization”. *IWA Wastewater Treatment Modeling*, Spa, Belgium, March 2014.

Patents

- [1] Srubar, W.; Williams, S.; Cameron, J.; Hubler, M.; **Cook, S.M.**; Nagarajan, A.; Heveran, C. "Methods of Forming Minerals using Biomineralizing Microorganisms and Biomineralizing Microorganisms and Compositions Formed Using Same" Publication No.: US-2022-0371953-A1. [https://ppubs.uspto.gov/pubwebapp/external.html?q=\(20220371953\).pn](https://ppubs.uspto.gov/pubwebapp/external.html?q=(20220371953).pn)
- [2] Srubar, W.; **Cook, S.M.**; Hubler, M.; Cameron, J. "Living Structural Material" Publication No.: US-2022-0144702-A1. [https://ppubs.uspto.gov/pubwebapp/external.html?q=\(20220144702\).pn](https://ppubs.uspto.gov/pubwebapp/external.html?q=(20220144702).pn)

Contracts and Grants

Current

- [1] Unlocking the Nationwide Potential of Water Reuse

Funding Agency: **Environmental Protection Agency**

Principal Investigator: Water Research Foundation (Katie Spahr)

CU-B Investigators: Karl Linden (CU PI), Sherri Cook, Amy Javernick-Will, Scott Summers, Cresten Mansfeldt

Other Investigators: Eric Dickenson (SNWA); Tzahi Cath (CSM); Miriam Hacker (UPenn)

Total Award: **\$3,245,999**

Cook Budget: \$399,997

Award Period: 01/2023-08/2026

Description: The objective is to align the development of science and technology with advances in sociological understanding of opportunities and barriers to unlock the full nationwide potential of water reuse. My role is to evaluate planned and potential reuse projects through a quantitative sustainable design process to identify strategies for water reuse capacity building efforts and help support the expansion of water reuse projects across a diversity of contexts.

- [2] CAREER: An Integrated Research and Education Plan to Navigate Tradeoffs in the Design of Sustainable and Resilient Water Reuse Systems

Funding Agency: **National Science Foundation**

Principal Investigator: **Sherri Cook**

Total Award: **\$509,310**

Award Period: 09/2021-08/2026

Description: The overall objective is to integrate research and education to improve water quality and access across communities in the U.S. and abroad by advancing the widespread adoption of sustainable and resilient water reuse strategies. This project will address a critical barrier to reliable access to safe water: the lack of widespread adoption of water reuse strategies. This proposed plan will help transform the treatment of, and access to, high quality, safe water without incurring unacceptable risks to human health, financial stability, and the environment.

- [3] Algae-grown Engineered Living Reinforced Concrete

Funding Agency: **Prometheus Materials, Inc.** (subcontract from Microsoft Corporation)

Principal Investigator: Mija Hubler (CU-B)

CU-B Co- Investigators: **Sherri Cook**, Jeffrey Cameron, Wil Srubar

Total Award: **\$160,000**

Cook Budget: \$4,000

Award Period: 08/2021-12/2022

Description: This project includes material evolution (turning living mortar into living reinforced concrete) and carbon performance (using life cycle assessment to quantify the embodied carbon). My role is to supervise the life cycle assessment and to consult on the biological growth (include algal strain, growth conditions, etc.).

- [4] Evaluation and Life Cycle Comparison of Ex-Situ Treatment Technologies for Poly- and Perfluoroalkyl substances in Groundwater

Funding Agency: **DOD ESTCP** (Environmental Security Technology Certification Program)

Principal Investigator: Water Research Foundation (Kenan Ozekin)

CU-B Investigators: **Sherri Cook**

Other Investigators: Chris Bellona (CO Mines), Chris Higgins (CO Mines), Charles Schaefer (CDM), Detlef Knappe (NCSSU)

Total Award: **\$1,090,451**

Cook Budget: \$298,136

Award Period: 10/2018-12/2022

Description: This research is investigating the life cycle environmental impacts and costs associated with various technologies for the removal of Poly- and Perfluoroalkyl substances from groundwater. My role is to develop an analysis framework, design the experiments to assure accurate and direct comparisons of each technology, and use the experimental data to performance detailed comparisons of each technology, over their life cycle, based on their PFAS removal performance.

[5] Programmable Resurrection of Materials Engineered to Heal Exponentially Using Switches

Funding Agency: **Defense Advanced Research Projects Agency**

Principal Investigator: Wil Srubar (CU-B)

CU-B Investigators: **Sherri Cook**, Ryan Gill, Jeffrey Cameron, Mija Hubler

Total Award: **\$1,902,281**

Cook Budget: \$585,000

Award Period: 04/2017-03/2023

Description: Hybrid living materials were developed by engineering microorganisms to produce cementitious or polymer materials and create a self-healing infrastructure system. My role is to help determine the best microorganisms, genes, and metabolisms; to design the experimental evaluation of performance under relevant environmental conditions; and to supervise microbiological experimental work and facilitate interdisciplinary interactions among multiple researchers in fields from microbiology, materials, and structural analysis.

Completed

[6] GOALI: Landfill Leachate Treatment with Solid Waste Generated Biochar

Funding Agency: **National Science Foundation**

Principal Investigator: **Sherri Cook**

Other Investigators: Scott Summers (CU-B), Mark Adams (WasteConnections)

Total Award: **\$340,450**

Award Period: 08/2017-07/2022

Description: The overall objective was to identify and develop a cost-effective and environmentally sustainable organic solid waste management plan. The diversion of organics from landfills to generate biochar adsorbents and renewable energy and the effectiveness of biochar to treat leachate was evaluated using experimental and life cycle modeling analyses.

[7] Resilient and Sustainable Sanitation Systems: Characteristics, Links, and Barriers

Funding Agency: **CU Boulder RIO Seed Grant**

Principal Investigator: **Sherri Cook**

Other Investigators: Max Boykoff, Amanda Carrico, Trisha Shrum

Total Award: **\$49,999**

Award Period: 06/2018-06/2021

Description: This project evaluated both sustainability and resilience of sanitation system in disaster prone areas. The project context included technical, social, and economic analyses of sanitation systems and decision-making processes by individual Ethiopian homes that were flooded annually to understand impact on sustained sanitation access.

- [8] Wood-based Biochar as an Alternative Adsorption Media for the Control of Off-gasses at Wastewater Treatment Plants
Funding Agency: **U.S. Forest Service Wood Innovations Program**
Principal Investigator: Greg Kester (California Association of Sanitation Agencies)
CU-B Investigators: **Sherri Cook** (PI), Scott Summers
Other Investigators: Gerardo Diaz (UC-Merced), Milan Alex (North Fork Community Power)
Total Award: **\$238,756**
Cook Budget: \$75,000
Award Period: 07/2017-12/2020
Description: This project identified a cost-effective method to optimize biochar from forest biomass for wastewater off-gasses. My role was to experimentally identify the best biochar production process at the lab-scale and to evaluate its costs based on wastewater treatment plants' pilot-scale experiments.
- [9] Integrated Water, Energy, and Emissions Trajectories and Tradeoffs for the U.S.
Funding Agency: **CU-Boulder Water Energy Nexus Interdisciplinary Seed Grant**
Principal Investigator: **Sherri Cook**
Other Investigators: Jana Milford (CU-B)
Total Award: **\$16,000**
Award Period: 02/2018-10/2018
Description: This project developed a tool for investigating tradeoffs and co-benefits of energy and water choices for air pollutant emissions and water use across the regions of the United States.
- [10] Rapid and Novel Agglomeration Process in the Water-Energy Nexus
Funding Agency: **CU-Boulder Water Energy Nexus Interdisciplinary Seed Grant**
Principal Investigator: Robert Davis (CU-B)
Other Investigators: **Sherri Cook**
Total Award: **\$7,872**
Cook Budget: \$1,300
Award Period: 02/2018-12/2018
Description: This project evaluated a new process for petroleum recovery from water. My role was to conduct a preliminary environmental impact analysis to identify optimal conditions and compounds.
- [11] Design of Risk-reducing, Innovative-implementable, Small-system Knowledge (DeRISK) Center
Funding Agency: **U.S. Environmental Protection Agency**
Principal Investigator: Scott Summers (CU-B)
CU-B Investigators: **Sherri Cook**, Chris Corwin, Karl Linden, Fernando Rosario, James Uber
Other Investigators: Chad Seidel, (Corona), Joy Barrett, William Hogrewe (RCAP); Robin Collins, James Malley (UNH); Aaron Dotson (UAA); Kiril Hristovski, Paul Westerhoff (ASU)
Total Award: **\$4,099,973**
Cook Budget: \$222,939
Award Period: 09/2014-07/2018
Description: This research center focused on identifying, developing, demonstrating, and facilitating innovative drinking water technology development and implementation. My role was to compare the environmental sustainability of treatment approaches and develop a decision support tool.

Teaching & Mentoring

Courses Taught

Title	Semester	Level	Required	Size*	Notes**
EVEN 5584: Sustainable Engineering Design	Spring 2022	Graduate	Required option	10	Developed new material
EVEN 3550: Sustainability Principles for Engineers	Fall 2021	Junior	Required	66	
CVEN 5534: Wastewater Treatment	Spring 2021	Graduate	Required option	22	Developed new material for online teaching
EVEN 3550: Sustainability Principles for Engineers	Fall 2020	Junior	Required	80	Developed new material for online teaching
CVEN 5534: Wastewater Treatment	Spring 2019	Graduate	Required option	14	
ENVM 6100: Special Topics – Evaluating Food Systems	Fall 2018	Graduate	Elective	9	Developed course structure; taught one credit for first time
EVEN 3550: Sustainability Principles for Engineers	Fall 2018	Junior	Required	63	Developed new material
CVEN 5534: Wastewater Treatment	Spring 2018	Graduate	Required option	16	
CVEN 5834: Special Topics - Sustainable Engineering Design	Fall 2017	Graduate	Required option	12	Developed new material
CVEN 4834: Special Topics - Sustainability Principles for Engineers	Spring 2017	Sophomore	Required	49	Developed new material
CVEN 5534: Wastewater Treatment	Fall 2016	Graduate	Required option	15	
CVEN 5834: Special Topics - Sustainable Engineering Design	Fall 2016	Graduate	Elective	13	Developed new course; taught for first time
CVEN 4834: Special Topics - Sustainability Principles for Engineers	Spring 2016	Sophomore	Required	58	Developed new material
CVEN 5534: Wastewater Treatment	Fall 2015	Graduate	Required option	9	
CVEN 4834: Special Topics - Sustainability Principles for Engineers	Spring 2015	Sophomore	Required	59	Developed new course; taught for first time
CVEN 5534: Wastewater Treatment	Fall 2014	Graduate	Required option	14	Developed new material; taught for first time

* Typical enrollment is 60 for required undergraduate courses and 15 for graduate courses; all courses were 3 credit hours

**“Developed new material” means that a third or more of the course material was created that semester)

Course Development

Fall 2018, ENVM 6100: Special Topics –Evaluating Food Systems

Co-created the structure and created and taught a one credit module for a new course for non-engineers in the Environmental Studies Department’s Masters of the Environment Program. The course structure included a team-based semester-long project focused on applying multiple evaluation techniques to the same food system when the system was functioning properly and when there was a critical change. My module was focused on environmental impacts, specifically the science behind different pollutants and environmental mechanisms. This course’s purpose is to teach different techniques for evaluating and improving food systems, holistically, using multiple methodologies (cost-benefit analysis, environmental impacts, and system dynamics).

Fall 2016, CVEN 5834: Special Topics – Sustainable Engineering Design

Created a new team-based semester design course focused on quantitative sustainable design. This is a graduate course that has received multidisciplinary interest with students enrolled from environmental, mechanical, and civil engineering. This course's purpose is to teach the fundamentals and mechanics of sustainability assessments, including life cycle assessment, life cycle costing, and sensitivity and uncertainty analyses. The focus is on the design, performance, and assessment of water and energy systems. Students are exposed to multiple examples and apply each method to one instructor selected system for homework assignments and to the system of their choosing for a team design project. Course was formalized as EVEN 5584.

Spring 2014, CVEN 4834: Special Topics – Sustainability Principles for Engineers

Created a new required undergraduate sophomore-level course on sustainability principles and emerging topics. This course's purpose is to familiarize students with sustainability definitions, challenges, and engineering solutions as well as fundamentals associated with mass and energy balances, economics, and environmental pollution mechanisms. Course material development included identifying reading material and topics (textbooks are limited) and creation of learning objectives, lecture materials, in-class activities, examples, homework problems, reading quizzes, and examinations. Course was formalized as EVEN 3550 (junior-level material was developed in 2018).

Student Advising*PhD Student Committee Chair*

Brooke Marten, 2024 anticipated

Graduated:

Eric Peterson (co-advised with Scott Summers), 2022

Katherine Chambers, 2021

Christopher Jones, 2019

Allison Davis (co-advised with Amy Javernick-Will), 2019

Kyle Thompson (co-advised with Scott Summers), 2018

*MS Thesis Student Committee Chair*Graduated:

Michelle Solomon; CEAE, 2019

Pranoti Kikale; EVEN, 2016

Elizabeth Shilling; EVEN, 2015

Post-doctoral Scholars

Cameron Oden; June 2020-July 2022

Juliana Artier (co-advised with Jeffrey Cameron); September 2018-August 2021

Liya Liang (co-advised with Ryan Gill); April 2017-Oct 2018

Aparna Nagarajan (co-advised with Jeffrey Cameron); April 2017-Oct 2018

Azadeh Keshavarzmohammadian (co-advised with Jana Milford); March 2018-July 2018

Other Research Assistant Alumni

MS Students: Rebecca Ventura (2019-2022); Marina D'souza (2020-2021); Emily Brucks (2020); Rana Abdel Satar (2019); Simon Matter (2018); Pranjali Kumar (2015)

Undergraduate Students: Claire Butler (2020-2021); Selena Hinojos (2018-2019); Katelyn Reeves (2018); Alex Nolan (2018); Tesia Golec (2017-2018); Vanessa Thompson (2017); Evan Valencia (2017); Garrett Geer (2016-2017)

Professional Service & Activities

- Professional Committees** AEESP Academic Job Application Review Committee; 2021
Water Environment Federation Academic Engagement Task Force; 2016 – 2018
Rocky Mountain Water Environment Association Internship Committee; 2016
- Advisory Committees** Dewberry (engineering consulting firm) Student Advisory Board; 2008
Pearson (education publishing and assessment) Student Advisory Board; 2007-2008
- Conference Organization** *Scientific Committee:* IWA 16th Anaerobic Digestion World Conference, Delft, the Netherlands, June 2019
Scientific Committee YWP Member: IWA Water Resource Recovery Modeling, Lac Beauport, Canada, March 2018
Scientific Committee: International Water Association/Water Environment Federation Nutrient Removal and Recovery, Denver, CO, July 2016
Workshop Co-organizer and Co-Chair: “Keeping up with the future: What’s the best way to advance process modelling?”, IWA Wastewater Treatment Modeling, Annecy, France, April 2016
Scientific Committee YWP Chair: IWA Wastewater Treatment Modeling, Annecy, France, April 2016
Moderator: Engineering Sustainability, Pittsburgh, PA, April 2015
Scientific Committee YWP Member: IWA Wastewater Treatment Modeling, Spa, Belgium, April 2014
Moderator: IWA Wastewater Treatment Modeling, Spa, Belgium, April 2014
Organizing Committee: Sustainable Energy Fellowship National Student Conference, Ann Arbor, MI, May 2009
Moderator: IWA Sludge Conference, Harbin, China, August 2009
- Journal Review** Environmental Science & Technology, Water Research, Environmental Science: Water Research & Technology, Science of the Total Environment, Sustainable Chemistry & Engineering, Environmental Engineering Science, Waste Management, Sustainable Production and Consumption, Journal of Cleaner Production
- Proposal Review** National Science Foundation; 2015, 2016, 2020; Department of Energy; 2020, 2021
- Professional Society Review** *Carbon Capture and Management Strategies for Energy Harvest from Wastewater,* WERF; 2014-2017
Direct Addition of High-Strength Organic Waste to Municipal Wastewater Anaerobic Digesters, WEF; 2012
- Professional Workshops** *Participant:* Development Effectiveness Workshop, CACHE, UIUC, IL, 2016
Participant: Environmental Engineering Grand Challenges Workshop, NSF and AEESP, Arlington, VA, 2016
Participant: Concept of Operations for a Wastewater Technology Testbed Network, NSF and WERF, Denver, CO, 2016
- Membership** Association of Environmental Engineering and Science Professors (AEESP); Water Environment Federation (WEF); International Water Association (IWA); American Water Works Association (AWWA); Tau Beta Pi; Order of the Engineer

- Professional Certificates** Engineer in Training Certification, Virginia; 2008
- Community Outreach** *Educator:* Detroit Area Pre-College Engineering Program; 2009, 2010
Organizer: Anaerobic Digester Energy Recovery Design; UofM; Nicaragua; 2009
Member: Water Collection & Distribution Design, Virginia Tech; Belize; 2008
Member: WEF YWP Rain Garden Project; Chicago, IL; 2008
- Professional Development Activities** Research Impact Fellowship Program; CEAS, 2021
 Leadership Training for Faculty Workshop, AEESP; 2021
 Environmental Engineering Program Leaders Annual Workshop, AEESP; 2021
 Leadership Introductory Workshop, CU-B LEAP; 2016
 Active Shooter Training, CU-B CUPD; 2016
 Learning Goals Workshop, CU-B Faculty Teaching Excellence Program; 2015
 Faculty Writing Workshops, CU-B Faculty Teaching Excellence Program; 2014
 LGBTQ Ally Training, CU-B; 2014
 Graduate Student Instructor Training, University of Michigan; 2012
 Flipped Classroom Certification from Sophia and Capella University; 2012

University Service & Activities

- University** *Member and Mentor:* Udall Scholarship Nomination Committee; 2016, 2017
Mentor: Faculty Student Mentor Program; 2014

- College** *Member:* CEAS Ad-hoc Budget Reduction Faculty Committee; 2020-2021
Member: CEAS CAREER proposal peer review and feedback; 2021
Emcee: Order of the Engineer Inaugural Ceremony; 2018
Guest Instructor: 50 to 75 min modules on *Sustainability, Life Cycle Assessment, and Water-Energy Nexus*; MCEN 5228 (Spring 2017); MCEN 4228 (Fall 2016, Fall 2015); CVEN 4147/5147 (Fall 2015); EVEN 1000 (Fall 2014, 2015); CVEN 5834 (Fall 2014)

- CEAE Department** *Member:* CEAE Curriculum Committee; 2014-2017, 2020-2022
Member: CEAE Faculty Search Committee; 2021
Member: CEAE Civil Systems Interdisciplinary Program; 2015-present
Member: CEAE Governance & Climate Committee; 2019-2020
Member: CEAE Classroom Renovation Committee; 2015
Member: CEAE Graduate Committee; 2014-2015

- EVEN Program** *Member:* EVEN Curriculum Committee; 2014-2015, 2018-2022
Member: EVEN Faculty Search Committee (2 positions); 2017-2018
Member: EVEN Graduate Committee; 2016-2017