

## Sabbie A. Miller

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### APPOINTMENTS

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| <b>Associate Professor, University of California, Davis</b><br>Department of Civil and Environmental Engineering     | 2022–present |
| <b>Faculty Scientist, Lawrence Berkeley National Laboratory</b>  | 2022–present |
| <b>Assistant Professor, University of California, Davis</b><br>Department of Civil and Environmental Engineering     | 2016–2022    |
| <b>Postdoctoral Scholar, University of California, Berkeley</b><br>Department of Civil and Environmental Engineering | 2014–2016    |

### EDUCATION

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| <b>Ph.D. in Civil and Environmental Engineering</b> – Structural Engineering and Geomechanics<br><i>Stanford University, Stanford CA</i>     | 2010–2014 |
| <u>Dissertation Title:</u> Application of time-dependent material properties and environmental impact analysis in bio-based composite design |           |
| <b>M.S. in Civil and Environmental Engineering</b> – Sustainable Design and Construction<br><i>Stanford University, Stanford CA</i>          | 2009–2010 |
| <b>B.S. in Civil Engineering</b><br><i>Washington University in Saint Louis, St. Louis MO</i>  | 2005–2008 |

### HONORS AND AWARDS

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| Resources, Conservation and Recycling—most downloaded paper in 2024  | 2025      |
| Stanford/Elsevier's World's Top 2% of Scientists   | 2024      |
| University of California Washington Center (UCDC) “Change the World through Research” Honor  | 2023      |
| EU-US Frontiers of Engineering, National Academy of Engineering (in partnership with the European Council of Academies of Applied Sciences, Technologies, and Engineering) | 2022      |
| National Science Foundation Early Career Award (CAREER)  | 2022–2027 |
| Johnson & Johnson WiSTEM <sup>2</sup> D Early Career Scholar   | 2021–2024 |
| University of California, Davis, Graduate Program Advising and Mentoring Award   | 2021      |
| Course REdesign And Teaching Effectiveness (CREATE) Fellow   | 2019–2020 |
| Hellman Foundation Fellowship  | 2018–2019 |
| Outstanding Reviewer Award: Construction and Building Materials  | 2018      |
| Outstanding Reviewer Award: Resources, Conservation and Recycling  | 2018      |
| Outstanding Reviewer Award: Journal of Cleaner Production  | 2017      |
| University of California President’s Postdoctoral Fellowship   | 2014–2016 |
| Young Professional Award from the Women in American Concrete Institute   | 2015      |
| The Stanford Woods Institute Rising Environmental Leaders Program  | 2014      |
| Environmental Protection Agency STAR Fellowship  | 2012–2014 |
| Achievement Rewards for College Students Graduate Fellowship   | 2012–2013 |
| Leavell Graduate Research Fellowship   | 2010–2012 |

## PEER-REVIEWED JOURNAL PUBLICATIONS

(supervised student and postdoc authors are underlined; statistics: [Google Scholar](#), [Web of Science](#))

73. Schultz, C., P.R. Cunningham, J. Fan, & **S.A. Miller**. (in press). "Integrating mechanical and environmental impact assessment in the design of fiber reinforced concrete." *ASCE Journal of Materials in Civil Engineering*. (Impact Factor: 3.2)
72. Fan, J., B.-L. Yeo, A. Markandeya, A. Martínez, J. Harvey, **S.A. Miller**, S. Nassiri. (in press). "Transforming almond shell waste into high-value activators for low-carbon concrete: life cycle assessment and technoeconomic analysis." *Journal of Building Engineering*. (Impact Factor: 6.7)
71. Van Roijen, E., S. Kane, J. Fan, J.A. Olsson, B. Bose, T. Hendrickson, S. Nordahl, A. Kendall, C.D. Scown, Corinne, & **S.A. Miller**. (in press). "Dynamic accounting of carbon uptake in the built environment." *Environmental Science & Technology*. (Impact Factor: 11.4)
70. Busch, P., A. Kim, C. Murphy, & **S.A. Miller**. (in press). "Policy mechanisms to decarbonize cement production: through the lens of California." *Environmental Research Infrastructure and Sustainability*. (Impact Factor: 2.7)
69. Kane, S., J.A. Olsson, & **S.A. Miller**. (2025). "Greenhouse gas emissions of global construction material production." *Environmental Research Infrastructure and Sustainability*, 5(1): 015020. (Impact Factor: 2.7)
68. Cunningham, P.R., L. Wang, S. Kane, A. Kim, B.M. Jenkins, **S.A. Miller**. (2025). "Lifecycle implications and mechanical properties of carbonated biomass ashes as carbon-storing supplementary cementitious materials." *Biomass and Bioenergy*, 197: 107772. (Impact Factor: 11.1)
67. Zarei, A., A.A. Butt, I. Filani, G. Pandit, **S.A. Miller**, J.T. Harvey, & S. Nassiri. (2025). "Pretreated rice straw ash as supplementary cementitious materials for concrete." *Materials and Structures*, 52:92. (Impact Factor: 3.8)
66. Olsson, J., H. Hafez, **S.A. Miller**, & K. Scrivener. (2025). "Greenhouse gas emissions and decarbonization potential of global fired clay brick production." *Environmental Science & Technology*, 59(4): 1909-1920. (Impact Factor: 11.4)
65. Van Roijen, E., **S.A. Miller**, & S.J. Davis. (2025). "Building materials could store more than 16 billion tonnes of CO<sub>2</sub> annually." *Science*, 387(6730): 176-182. (Impact Factor: 50.3)
64. Kim, A., G. Chaboya, H. Kwon, & **S.A. Miller**. (2025). "Disproportionate impacts of building materials production facilities on neighboring communities." *Environmental Research Infrastructure and Sustainability*, 5(1): 015001. (Impact Factor: 2.7)
63. Kane, S., A. Bin Thaneya, A.P. Gursel, J. Fan, B. Bose, T.P. Hendrickson, S.L. Nordahl, C.D. Scown, **S.A. Miller**, & A. Horvath. (2025). "Uncertainty in carbon dioxide removal potential of biochar." *Environmental Research Letters*, 20(1): 014062. (Impact Factor: 6.7)
62. Martinez, A., & **S.A. Miller**. (2025). "Life cycle assessment and production cost of geopolymer concrete: A meta-analysis." *Resources, Conservation and Recycling*, 215: 108018. (Impact Factor: 13.2)
61. Cunningham, P.R., L. Wang, S. Nassiri, P. Thy, J.T. Harvey, B.M. Jenkins, & **S.A. Miller**. (2025). "Compressive strength and regional supply implications of rice straw and rice hull ashes used as a supplementary cementitious material." *Resources, Conservation and Recycling*, 214: 108024. (Impact Factor: 13.2)
60. Butt, A., I. Filani, A. Zarei, G.A. Pandit, **S.A. Miller**, J.T. Harvey, & S. Nassiri. (2025). "Environmental and economic impacts of processing rice straw with water for energy and coproducts." *Resources, Conservation and Recycling*, 212: 107952. (Impact Factor: 13.2)

59. Amitani, A., & **S.A. Miller**. (2024). "Varying aggregate sizes, plasticizers, and supplementary cementitious materials to efficiently use Portland clinker in concrete." *Environmental Research Infrastructure and Sustainability*, 4(4): 045011. (Impact Factor: 2.7)
58. Colligan, P., E. Van Roijen, S. Kane, F.C. Moore, & **S.A. Miller**. (2024). "The unaccounted-for climate costs of materials." *Environmental Research Letters*, 19 (11), 114063. (Impact Factor: 6.7)
57. **Miller, S.A.**, M. Juenger, K. E. Kurtis, & J. Weiss. (2024) "Cement and alternatives in the Anthropocene." *Annual Review of Environment and Resources*, 49. (Impact Factor: 16.4)
56. Van Roijen, E., K. Sethares, A. Kendall, & **S.A. Miller**. (2024). "The climate benefits from cement carbonation are being over-estimated." *Nature Communications*, 15, 4848. (Impact Factor: 16.6)
55. **Miller, S.A.** (2024). "Joint recycling of steel and cement cuts CO<sub>2</sub> emissions." *Nature*, 629, 1008-1009. (Impact Factor: 64.8) *invited article*
54. Olsson, J.A., **S.A. Miller**, & J.D. Kneifel. (2024). "A review of current practice for life cycle assessment of cement and concrete." *Resources, Conservation and Recycling*, 206: 107619. (Impact Factor: 13.2)
53. Bin Thaneya, A., A. P. Gursel, S. Kane, **S.A. Miller**, & A. Horvath. (2024). "Assessing uncertainty in building material emissions using scenario-aware Monte Carlo simulation." *Environmental Research Infrastructure and Sustainability* 4: 025003. (Impact Factor: 2.7)
52. Ro, J.W., P.R. Cunningham, **S.A. Miller**, A. Kendall, & J. Harvey. (2024). "Technical, economic, and environmental feasibility of rice hull ash from electricity generation as a mineral additive to concrete." *Scientific Reports*, 14(1): 9158. (Impact Factor: 4.6)
51. Kane, S., & **S.A. Miller**, (2024). "Mass, enthalpy, and chemical-derived emission flows in mineral processing." *Journal of Industrial Ecology*, 28: 469-481. (Impact Factor: 7.2)
50. Kane, S., & **S.A. Miller**, (2024). "Predicting biochar properties and pyrolysis life-cycle inventories with compositional modeling." *Bioresources Technology*, 399: 130551. (Impact Factor: 11.4)
49. Van Roijen, E., & **S.A. Miller**, (2024). "Towards the production of net-negative greenhouse gas emission bio-based plastics from 2nd and 3rd generation feedstocks." *Journal of Cleaner Production*, 445: 141203. (Impact Factor: 11.1)
48. Martínez, A., & **S.A. Miller**, (2023). "A review of drivers for implementing geopolymers in construction: Codes and constructability." *Resources, Conservation and Recycling*, 199: 107238. (Impact Factor: 13.2)
47. Kane, S., **S.A. Miller**, K. Kurtis, J. Youngblood, E. Landis, & W.J. Weiss, (2023). "Harmonized life-cycle inventories of nanocellulose and its application in composites." *Environmental Science & Technology*, 57(48): 19137–19147. (Impact Factor: 11.4)
46. Kim, A., & **S.A. Miller** (2023). "Meeting industrial decarbonization goals: a case study of and roadmap to a net-zero emissions cement industry in California." *Environmental Research Letters*, 18: 104019. (Impact Factor: 6.7)
45. Olsson, J.A., **S.A. Miller**, & M.G. Alexander (2023). "Near-term pathways for decarbonizing global concrete production." *Nature Communications*, 14(1): 4574. (Impact Factor: 16.6)
44. Knight, K.A., Cunningham, P.R., & **S.A. Miller**. (2023). "Optimizing supplementary cementitious material replacement to minimize the environmental impacts of concrete." *Cement and Concrete Composites*, 139: 105049. (Impact Factor: 10.5)
43. Cunningham, P.R., P.G. Green, S.J. Parikh, J.T. Harvey, & **S.A. Miller**. (2023). "Engineering the performance of post-consumer calcium carbonate from carpet in cement-based materials through pre-treatment methods." *Construction and Building Materials*, 368: 130451. (Impact Factor: 7.4)
42. Shah, I.H., **S.A. Miller**, D. Jiang, & R.J. Myers. (2022). "Cement substitution with secondary materials can reduce annual global CO<sub>2</sub> emissions by up to 1.3 gigatons." *Nature Communications*, 13: 5758. (Impact Factor: 16.6)

41. Kim, A., P.R. Cunningham, K. Kamau-Devers, & S.A. Miller. (2022). “OpenConcrete: A tool for estimating the environmental impacts from concrete production.” *Environmental Research Infrastructure and Sustainability*, 2: 041001. (Impact Factor: 2.7)
40. Cunningham, P.R., & S.A. Miller. (2022). “A material flow analysis of carpet: Where does the carpet go?” *Journal of Cleaner Production*, 368: 133243. (Impact Factor: 11.1)
39. Busch, P., A. Kendall, C. Murphy, & S.A. Miller. (2022). “Literature review on policies to mitigate GHG emissions for cement and concrete.” *Resources, Conservation and Recycling*, 182: 106278. (Impact Factor: 13.2)
38. Van Roijen, E. & S.A. Miller. (2022). “A review of bioplastics at end-of-life: Linking experimental biodegradation studies and life cycle impact assessments.” *Resources, Conservation and Recycling*, 181: 106236. (Impact Factor: 13.2)
37. Kane, S., E. Van Roijen, C. Ryan, & S.A. Miller. (2022). “Reducing the environmental impacts of plastics while increasing strength: Biochar fillers in biodegradable, recycled, and fossil-fuel derived plastics.” *Composites Part C: Open Access*, 8: 100253. (Impact Factor: 4.2)
36. Kamau-Devers, K., & S.A. Miller (2022). “Using a micromechanical viscoelastic creep model to capture multi-phase deterioration in bio-based wood polymer composites exposed to moisture.” *Construction and Building Materials*, 314(Part B): 125252. (Impact Factor: 7.4)
35. Miller, S.A., E. Van Roijen, P.R. Cunningham, & A. Kim. (2021). “Opportunities and challenges for engineering construction materials as carbon sinks.” *RILEM Technical Letters*, 6: 105–118. (Impact Factor: 2.25)
34. Miller, S.A., G. Habert, R.J. Myers, & J.T. Harvey. (2021). “Achieving net zero greenhouse gas emissions in the cement industry via value chain mitigation strategies.” *One Earth, Cell Press*, 4(10): 1398–1411. (Impact Factor: 16.2)
33. Brinkman, L., & S.A. Miller. (2021). “Environmental impacts and environmental justice implications of supplementary cementitious materials for use in concrete.” *Environmental Research Infrastructure and Sustainability*, 1(2): 025003. (Impact Factor: 2.7)
32. Miller, S.A., & E. Grubert. (2021) “US industrial sector decoupling of energy use and greenhouse gas emissions under COVID: durability and decarbonization.” *Environmental Research Communications*, 3: 031003. (Impact Factor: 3.2)
31. Cunningham, P.R., L. Wang, P. Thy, B.M. Jenkins, & S.A. Miller. (2021) “Effects of leaching method and ashing temperature of rice residues for energy production and construction materials.” *ACS Sustainable Chemistry & Engineering*, 9(10): 3667–3687. (Impact Factor: 8.4)
30. Cunningham, P.R., P.G. Green, & S.A. Miller. (2021) “Utilization of post-consumer carpet calcium carbonate (PC4) from carpet recycling as a mineral resource in concrete.” *Resources, Recycling and Conservation*, 169: 105496. (Impact Factor: 13.2)
29. Miller, S.A. (2021) “The role of data variability and uncertainty in the probability of mitigating environmental impacts from cement and concrete” *Environmental Research Letters*, 16(5): 054053. (Impact Factor: 6.7)
28. Kamau-Devers, K., V.R. Yanez, V.W.M. Peralta, & S.A. Miller. (2021) “Using internal micro-scale architectures from additive manufacturing to increase material efficiency.” *Journal of Cleaner Production*, 291: 125799. (Impact Factor: 11.1)
27. Habert, G., S.A. Miller, V.M. John, J.L. Provis, A. Favier, A. Horvath, & K.L. Scrivener. (2020) “Environmental impacts and decarbonization strategies in the cement and concrete industries.” *Nature Reviews Earth & Environment*, 1(11): 559–573. (Impact Factor: 42.1)
26. Rissman, J., C. Bataille, E. Masanet, N. Aden, W.R. Morrow III, N. Zhou, N. Elliott, R. Dell, N. Heeren, B. Huckestein, J. Cresko, S.A. Miller, J. Roy, P. Fennell, B. Cremmins, T.K. Blank, D. Hone, E.D. Williams, S. de la Rue du Can, B. Sisson, M. Williams, J. Katzenberger, D. Burtraw, G. Sethi, H. Ping, D. Danielson, H. Lu,

- T. Lorber, J. Dinkel, & J. Helseth. (2020) “Technologies and policies to decarbonize global industry: Review and assessment of mitigation drivers through 2070.” *Applied Energy*, 266: 114848. (Impact Factor: 11.2)
25. **Miller, S.A.**, & F.C. Moore. (2020) “Climate and health damages from global concrete production.” *Nature Climate Change*, 10: 439–443. (Impact Factor: 30.7)
  24. **Miller, S.A.** (2020) “The role of cement service-life on the efficient use of resources.” *Environmental Research Letters*, 15 (2): 0240004. (Impact Factor: 6.7)
  23. **Miller, S.A.**, & R.J. Myers. (2020) “Environmental impacts of alternative cement binders.” *Environmental Science & Technology*, 54 (2): 677–686. (Impact Factor: 11.4)
  22. **Kamau-Devers, K.**, & **S.A. Miller**. (2020) “The environmental attributes of wood fiber composites with bio-based or petroleum-based plastics.” *The International Journal of Life Cycle Assessment*, 25:1145–1159. (Impact Factor: 4.8)
  21. **Cunningham, P.R.**, & **S.A. Miller**. (2020) “Quantitative assessment of alkali-activated materials: Environmental impact and property assessments.” *ASCE Journal of Infrastructure Systems*, 26(3): 04020021. (Impact Factor: 3.3)
  20. **Kourehpaz, P.**, & **S.A. Miller**. (2019) “Eco-efficient design indices for reinforced concrete members.” *Materials & Structures*, 52: 96–109. (Impact Factor: 3.8)
  19. **Miller, S.A.**, **P.R. Cunningham**, & J.T. Harvey. (2019) “Rice-based ash in concrete: A review of past work and potential environmental sustainability.” *Resources Conservation and Recycling*, 146: 416–430. (Impact Factor: 13.2)
  18. **Kamau-Devers, K.**, **Z. Kortum**, & **S.A. Miller**. (2019) “Hydrothermal aging of bio-based poly(lactic acid) (PLA) wood polymer composites: Studies on sorption behavior, morphology, and heat conductance.” *Construction and Building Materials*, 214: 290–302. (Impact Factor: 7.4)
  17. **Miller, S.A.** (2018) “Natural fiber textile reinforced bio-based composites: Mechanical properties, creep, and environmental impacts.” *Journal of Cleaner Production*, 198: 587–598. (Impact Factor: 11.1)
  16. **Fan, C.** & **S.A. Miller**. (2018) “Reducing greenhouse gas emissions for prescribed concrete compressive strength.” *Construction and Building Materials*, 167: 612–623. (Impact Factor: 7.4)
  15. **Miller, S.A.** (2018) “Supplementary cementitious materials to mitigate greenhouse gas emissions from concrete: Can there be too much of a good thing?” *Journal of Cleaner Production*, 178: 587–598. (Impact Factor: 11.1)
  14. **Miller, S.A.**, V.M. John, S.A. Pacca, & A. Horvath. (2018) “Carbon dioxide reduction potential in the global cement industry by 2050.” *Cement and Concrete Research*, 114: 115–124. (Impact Factor: 11.4)
  13. **Miller, S.A.**, A. Horvath, & P.J.M. Monteiro. (2018) “Impacts of booming concrete production on water resources worldwide.” *Nature Sustainability*, 1: 69–76. (Impact Factor: 27.6)
  12. Monteiro, P.J.M., **S.A. Miller**, & A. Horvath. (2017) “Towards Sustainable Concrete.” *Nature Materials*, 16: 698–699. (Impact Factor: 41.2)
  11. **Miller, S.A.**, P.J.M. Monteiro, C.P. Ostertag, & A. Horvath. (2016) “Concrete mix proportioning for desired strength and reduced global warming potential.” *Construction and Building Materials*, 128: 410–421. (Impact Factor: 7.4)
  10. **Miller, S.A.**, A. Horvath, & P.J.M. Monteiro. (2016) “Readily implementable techniques can cut annual CO<sub>2</sub> emissions from the production of concrete by over 20%.” *Environmental Research Letters*, 11: 074029. (Impact Factor: 6.7)
  9. **Miller, S.A.**, P.J.M. Monteiro, C.P. Ostertag, & A. Horvath. (2016) “Comparison indices for design and proportioning of concrete mixtures taking environmental impacts into account.” *Cement and Concrete Composites*, 68: 131–143. (Impact Factor: 10.5)



8. **Miller, S.A.**, S.L. Billington & M.D. Lepech. (2016) "Influence of carbon feedstock on potentially net beneficial environmental impacts of bio-based composites." *Journal of Cleaner Production*, 132: 266–278. (Impact Factor: 11.1)
7. **Miller, S.A.**, A. Horvath, P.J.M. Monteiro, & C.P. Ostertag. (2015) "Greenhouse gas emissions from concrete can be reduced by using age as a design factor." *Environmental Research Letters*, 10: 114017. (Impact Factor: 6.7)
6. **Miller, S.A.**, Srubar III, W. V., Billington, S.L., & M.D. Lepech. (2015) "Integrating durability-based service life predictions with environmental impact assessments of natural fiber-reinforced composite materials." *Resources, Conservation and Recycling*, 99: 72–83. (Impact Factor: 13.2)
5. **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2015) "Static versus time-dependent material selection charts and application in wood flour composites." *Journal of Biobased Materials and Bioenergy*, 9: 273–283. (Impact Factor: 1.4)
4. Srubar III, W.V., **S.A. Miller**, M.D. Lepech, & S.L. Billington. (2014). "Incorporating spatiotemporal effects and moisture diffusivity into a multi-criteria materials selection methodology for wood-polymer composites." *Construction and Building Materials*, 71: 589–601. (Impact Factor: 7.4)
3. **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2013). "Evaluation of functional units including time-dependent properties for environmental impact modeling of biobased composites." *Journal of Biobased Materials and Bioenergy*, 7: 588–599. (Impact Factor: 1.4)
2. **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2013). "Application of multi-criteria material selection techniques to constituent refinement in biobased composites." *Materials & Design*, 52: 1043–1051. (Impact Factor: 8.4)
1. **Miller, S.A.**, S.L. Billington & M.D. Lepech. (2013). "Improvement in environmental performance of poly ( $\beta$ -hydroxybutyrate)-co-( $\beta$ -hydroxyvalerate) composites through process modifications." *Journal of Cleaner Production*, 40: 190–198. (Impact Factor: 11.1)

## JOURNAL PUBLICATIONS SUBMITTED

(supervised student authors are underlined)

1. Kim, A., C.E. Bronner, & **S.A. Miller**. (submitted). "Integrating service-learning with sustainability engineering to broaden student learning outcomes." *ASCE Journal of Civil Engineering Education*. (Impact Factor: 1.6)
2. Ju, M., D.F.T. Razakamandimby R., T.-S. Han, **S.A. Miller**, & K. Park. (submitted) "Material property and environmental impact evaluation of concrete with carbon sequestered recycled fine aggregate." *Construction & Building Materials*. (Impact Factor: 7.4)
3. Van Roijen, E., & **S.A. Miller**. (submitted). "Using biogenic resources to make plastics a global carbon sink: A roadmap for sustainable decarbonization by 2050." *Nature Communications*. (Impact Factor: 16.1)
3. Martinez, D.M., **S.A. Miller**, & P.J. M. Monteiro. (submitted). "How sustainable was ancient Roman concrete?" *iScience*. (Impact Factor: 4.6)
6. Olsson, J.A., S. Ranganath, **S.A. Miller**, & J.D. Kneifel. (submitted). "A framework for a performance-based sustainability comparison of concrete." *Journal of Cleaner Production*. (Impact Factor: 11.1)
7. Bose, B., T.P. Hendrickson, S.L. Nordahl, S. Kane, J. Fan, **S.A. Miller**, C.D. Scown. (submitted). "Life-cycle greenhouse gas footprint of CLT from mixed hardwood and softwood from fire-prone California forests." *Environmental Science & Technology*. (Impact Factor: 11.4)
8. Markandeya, A., J.C.B. de Moraes, T.C. Ferreira Gomes, B.-L. Yeo, J. Fan, **S.A. Miller**, J.T. Harvey, S. Nassiri. (submitted). "Feasibility of Using California-Based Almond Shells for Alkali-Activation of Slag." *ASCE Journal of Materials in Civil Engineering*. (Impact Factor: 3.2)

9. King, C.B., E. Van Rooijen, H. Choudhary, & **S.A. Miller**. (submitted). "Life cycle assessment of chemical recycling of polyethylene terephthalate to produce aramid polymers." *ACS Sustainable Chemistry & Engineering*, 9(10): 3667–3687. (Impact Factor: 8.4)

## OTHER PUBLICATIONS

(supervised student authors are underlined)

18. *Policy Brief*: J.A. Olsson & **S.A. Miller**. (2025) "Mitigating CO<sub>2</sub> Emissions from California's Concrete Infrastructure." The National Center for Sustainable Transportation, Davis, CA.
17. *News Perspective*: **S.A. Miller**. (2024) "Pathways to Decarbonize Society's Most Popular Material." The National Academy of Engineering, Washington DC.
16. *Technical Report*: K. Knight, & **S.A. Miller**. (2024) "Parameters Driving Concrete Carbonation at its End-of-Life for Direct Air Capture in Transportation Projects." The National Center for Sustainable Transportation, Davis, CA.
15. *Conference Proceeding*: W. Schmidt, L. Midroit, P.R. Cunningham, **S.A. Miller**, & S. Amziane (2023) "The Influence of Biochar on the Flow Properties, Early Hydration, and Strength Evolution of Paste." Bio-Based Building Materials. ICBBM 2023. RILEM Book Series, vol 45. Springer, Cham. (ICBBM 2023, Vienna, Austria, 21–23 June 2020)
14. *Technical Report*: K.S.T. Chopperla, S. Ramanathan, K.B. Ravi, A. Mateos, J. Harvey, S. Nassiri, J.A. Buscheck, S.A. Miller, O.B. Isgor, W.J. Weiss, (2023) "Cellulose Nanocrystals as a Value-Based Additive for Low Carbon Footprint Concrete with Limestone." Joint Institute for Wood Products Innovation.
13. *Trade Journal*: P.R. Cunningham, **S.A. Miller**, & W. Schmidt, (2023) "EDGE Sustainability Benchmarking for Construction." Concrete Plant International.
12. *Policy Brief*: P. Busch, A. Kendall, C. Murphy, & **S.A. Miller**, (2022) "Industrial Decarbonization: Policy Pathways for the Cement & Concrete Sector." The Policy Institute for Energy, Environment, and the Economy, Davis, CA.
11. *Policy Brief*: P.R. Cunningham & **S.A. Miller**, (2021) "Quantifying Environmental Impacts from Concrete Production, While Accounting for Data Variability and Uncertainty." The National Center for Sustainable Transportation, Davis, CA
10. *Technical Report*: P.R. Cunningham & **S.A. Miller**, (2021) "Benchmarking GHG Emissions from California Concrete and Readily Implementable Mitigation Methods." The National Center for Sustainable Transportation, Davis, CA
9. *Policy Brief*: Ichimaru Watanabe, S., K. Kamau-Devers, P.R. Cunningham, & **S.A. Miller**, (2021) "Material Efficiency as a Means to Lower Environmental Impacts from Concrete." The National Center for Sustainable Transportation, Davis, CA
8. *Technical Report*: Ichimaru Watanabe, S., K. Kamau-Devers, P.R. Cunningham, & **S.A. Miller**, (2021) "Transformation of Engineering Tools to Increase Material Efficiency of Concrete." The National Center for Sustainable Transportation, Davis, CA
7. *Conference Proceeding*: **Miller, S.A.** (2020) "Life cycle environmental impact considerations for structural concrete in transportation infrastructure." Pavement, Roadway, and Bridge Life Cycle Assessment 2020: Proceedings of the International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020 (LCA 2020, Sacramento, CA, 3–6 June 2020)
6. *Technical Report*: Lead Authors: K.L. Scrivener, V.M. John, E.M. Gartner, Peer Review Group Members (and contributing scientists): M. Alexander, Y. Ballim, B. Blair, C. Ciaraldi, A. Chatterjee, J. Cheung, P. Fonta, R. Gettu, A. Horvath, E. F. Irassar, F. Martirena, **S.A. Miller**, S.A. Pacca, J. Provis, W. Schmidt, M. Schneider, S. Shah, M. Thomas, S. Tongbo, T. Qian, H. van Damme, & Y. Cheng, (2017), "Eco-efficient cements: Potential economically viable solutions for a low-CO<sub>2</sub> cement-based materials industry." United Nations Environment Programme, Paris, France

5. Book Chapter: Billington, S.L., W.V. Srubar III, A.T. Michel, **S.A. Miller**. (2014) “Renewable biobased composites for civil engineering.” Sustainable Composites and Advanced Materials. Eds. A.N. Netravali and C. Pastore, DESTech Publications, Inc., Lancaster, PA.
4. Technical Report: **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2013) “Mechanical and environmental characterization of bio-based composites.” The John A. Blume Earthquake Engineering Center Technical Report No. 179. Stanford University, Stanford, CA.
3. Conference Proceeding: **Miller, S.A.**, & S.L. Billington. (2012) “Creep behavior and modeling of PHBV-based composites for construction applications.” Composites 2012. Las Vegas, NV, American Composites Manufacturers Association.
2. Conference Proceeding: **Miller, S.A.**, S.L. Billington, & M.D. Lepech. (2012) “Investigation of process improvements on PHBV-based composites using multi-criteria selection.” Composites 2012. Las Vegas, NV, American Composites Manufacturers Association.
1. Conference Proceeding: **Miller, S.A.**, S.L. Billington, & M.D. Lepech. (2012) “Application of creep properties to service prediction in life cycle assessment and multi-criteria material selection.” 12<sup>th</sup> International Conference on Biocomposites. Niagara Falls, Ontario, Canada.

## INVITED AND KEYNOTE PRESENTATIONS

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42. **Miller, S.A.** & S. Nassiri. (2025) “Sustainability in Construction: Life Cycle Assessment of Cement, Concrete, and Supplementary Cementitious Materials” Transportation Research Board Annual Meeting, Washington D.C., January 5, 2025. Invited talk for a special session run at the Transportation Research Board for researchers on life cycle assessment methodology for decarbonizing transportation-relevant materials.
41. **Miller, S.A.** (2024) “Strategies for decarbonizing concrete through supplementary cementitious materials, material efficiency measures, material longevity, and end-of-life solutions” 2024 Votorantim Cimentos Annual Meeting, Remote. November 26, 2024. Invited talk for the annual conference for the Votorantim Cimentos (one of the world’s largest cement producers). It was one of three invited talks.
40. **Miller, S.A.** (2024) “Tensions in concurrent engineering of food, energy and materials systems” 2024 Northern California Regional Meeting of the National Academy of Engineering, Davis, CA. May 30, 2024. Invited talk for the regional conference for the US National Academy of Engineering. It was one of three invited talks for the presentation portion of the symposium.
39. **Miller, S.A.** (2024) “A structure to adopt low carbon concrete for State Departments of Transportation” Rocky Mountain Institute Low Carbon Concrete Series, Remote. May 29, 2024. Invited talk for the Rocky Mountain Institute as part of their series to educate representatives from governmental purchasing groups on strategies to implement buy clean efforts rapidly.
38. **Miller, S.A.** (2024) “A global perspective on cement/concrete decarbonization” Industry Decarbonization in Indonesia Training Week at Lawrence Berkeley National Laboratory, Berkeley, CA. March 25, 2024. Invited talk for a conference funded by the ClimateWorks foundation run for non-governmental organizations, national laboratory employees, and delegates from Indonesia.
37. **Miller, S.A.** (2024) “Environmental Impact Assessment: Integrating Complexities” Advanced Materials for Sustainable Infrastructure Development (GRC)–Accelerating Sustainable Concrete Construction, Ventura, CA. February 27, 2024. Invited plenary talk at a Gordon Research Conference, which are known as international research conferences focused on the cutting edge of research in the field.
36. **Miller, S.A.** (2023) “Current perspectives on the environmental impacts of building materials” Institute of Physics, Environmental Research 2023 (ER2023), Remote, November 15, 2023. The keynote presentation at the Environmental Research Infrastructure and Sustainability session at the Institute of Physics annual online conference. (*Keynote Presentation*).
35. **Miller, S.A.** (2023) “A Case for Sustainability” Engineering Research Vision Alliance, San Jose, CA, July 26, 2023. The keynote presentation at the Engineering Research Vision Alliance workshop on Sustainable



Materials. This organization runs workshops for the U.S. National Science Foundation on next-stage research visions and priorities. (*Keynote Presentation*).

34. **Miller, S.A.** (2023) “Quantifying CO<sub>2</sub> emissions and emissions mitigation strategies for concrete” Energy Analysis & Environmental Impacts Division (EAEI) Seminar, Lawrence Berkeley National Laboratory, Berkeley, CA, July 21, 2023. Invited presentation at Lawrence Berkeley National Laboratory for their ongoing Energy Analysis & Environmental Impacts Division seminar series.
33. **Miller, S.A.** (2023) “Understanding the environmental impacts of calcium sulfoaluminate cements” The CSA Cements Seminar, Remote, Los Angeles, CA, June 20, 2023. Invited presentation at the Calcium Sulfoaluminate (CSA) Cements Seminar, which is a combined academic- and practice-oriented conference.
32. **Miller, S.A.** (2023) “Systems level modeling of concrete and carbon mitigation strategies” Korean Concrete Institute, Remote, Seoul, South Korea, May 18, 2023. Invited presentation at the Korean Concrete Institute’s seminar series run in parallel with an EU-funded cement and concrete program.
31. **Miller, S.A. & A. Kim** (2023) “Integrating materials sustainability education into university and policymaker environments” American Concrete Institute Convention, San Francisco, CA, April 3, 2023. Invited presentation at the American Concrete Institute Convention in the sustainability and education section.
30. **Miller, S.A.** (2023) “Overview of Sector: Emissions Sources, Policy Levers, & Technology Solutions” Virtual Workshop on Carbon Management for the Cement Industry, Remote, January 24, 2023. Invited presentation at a workshop held by the Great Plains Institute and the Department of Energy, Office of Fossil Energy and Carbon Management to address the challenges in applying carbon capture and sequestration for cement production in the United States.
29. **Miller, S.A.** (2023) “Drivers for low carbon cement and concrete” Material Systems and Sustainability Seminars, Remote, Vancouver, BC, Canada, January 18, 2023. Invited presentation at the University of British Columbia for students in their newly started sustainability-focused program.
28. **Miller, S.A.** (2023) “Embodied carbon and structural systems” Atelier Ten–Environmental Design Consultants + Engineers Lunch & Learn Series, Remote, January 10, 2023. Invited presentation by Atelier Ten, an industry firm, with an audience that was present globally.
27. **Miller, S.A.** (2022) “Engineering Environmentally Sustainable Materials” Structural Engineering and Structural Mechanics Seminar Series, Davis, CA, November 17, 2022. Invited presentation for the UC Davis Structural Engineering and Structural Mechanics Seminar Series in which 4 speakers were invited.
26. **Miller, S.A.** (2022) “Driving decarbonization and carbon sequestration in novel materials development” 2022 EU-US Frontiers of Engineering Symposium, Bled, Slovenia, October 20, 2022. Invited presentation for the National Academies of Engineering EU-US symposium.
25. **Miller, S.A., C.D. Scown, A. Horvath.** (2022) “Carbon negative materials assessment” The ARPA-E Harnessing Emissions into Structures Taking Inputs from the Atmosphere Meeting, Seattle, WA, September 27, 2022. Invited talk on methods to quantify carbon-negativity for an ARPA-E research portfolio.
24. **Miller, S.A.** (2022) “Modeling and experimental efforts to create net-carbon-uptake building materials” Google ATI Seminar Series, Remote, August 29, 2022. Invited talk for a special Google seminar series.
23. **Miller, S.A.** (2022) “Addressing concrete performance in carbon emissions mitigation” The American Ceramics Society (ACerS) Cements 2022, Irvine, CA, July 11, 2022. The first keynote seminar for the ACerS conference. (*Keynote Presentation*).
22. **Miller, S.A., P.R. Cunningham, J.A. Olsson, A. Kim, & E. Van Roijen.** (2022). “Deep decarbonization of cement and coupled effects on other environmental impacts.” The Corvallis Workshops: Concrete Fit for Purpose and Planet, Corvallis, Oregon, Jun 23, 2022. Invited talk from the Corvallis Workshops to disseminate findings.
21. **Miller, S.A.** (2022). “Wood and wood-based materials for civil engineering applications.” California Natural Resources Agency. Sacramento, California. May 24, 2022. Invited talk for the Board of Forestry, Calfire, and

the California Natural Resources Agency to disseminate findings on the utilization of biomass resources in building applications to sequester CO<sub>2</sub>.

20. **Miller, S.A.** (2022). “Engineering building materials to mitigate environmental burdens.” Sandia National Labs Visitation. Davis, California. April 26, 2022. Invited talk from the UC Davis College of Engineering to disseminate findings and build collaborations with Sandia National Labs.
19. **Miller, S.A.** (2022). “Modeling the environmental impacts of cement and concrete.” Google X Teams Meeting. Remote, Mountain View, California. April 19, 2022. Invited talk for a weekly seminar series run by Google for their research branch (X Development), which has international attendance by their researchers.
18. **Miller, S.A.** (2022). “Drivers in CO<sub>2</sub> emissions and water demand to produce concrete.” What is Water’s Role in a Carbon Neutral Future? Industrial Decarbonization Session, Remote, Albuquerque, New Mexico. April 5, 2022. Invited talk for a series used to develop a Department of Energy report organized by Sandia National Laboratory on the role of water in national decarbonization efforts.
17. **Miller, S.A.** (2022). “Pathways to net-zero cement.” Beijing Municipal Science & Technology Commission (BMSTC)–Panel of Decarbonizing Heavy Industry. Remote, Beijing, People’s Republic of China. March 29, 2022. Invited talk for a conference series attended by ~1,250,000 people worldwide.
16. **Miller, S.A.** (2022). “Improving the Environmental Sustainability of Concrete through Material Efficiency.” Webinar, National Center for Sustainable Transportation, UC Davis. Remote, Davis, California. February 16, 2022. Invited webinar run by the Institute of Transportation Studies and publicized to policymakers as well as departments of transportation.
15. **Miller, S.A.** (2022). “TEDx: What are the environmental impacts of materials?” TEDx, Remote, Land Park Dr. Sacramento. February 12, 2022. Invited talk targeted at a very general audience for part of the environmental series run by TEDx.
14. **Miller, S.A.** (2022). “Life cycle engineering of low carbon building materials.” Oak Ridge National Laboratory, Sustainable Low-Carbon Building Materials Workshop, Remote, Oak Ridge, Tennessee. January 25, 2022. Invited talk that was part of an invitation-only workshop and presentation series run by Oak Ridge National Laboratory.
13. **Miller, S.A.** (2022). “Environmental justice, climate justice, and building materials.” UC Davis, Environmental Justice Conference at UC Davis. Remote, Davis, California. January 8, 2022. Invited talk for a university-wide seminar with a keynote presentation by the chancellor.
12. **Miller, S.A.** (2021). “Getting to net-zero greenhouse gas emissions from cement.” Invited Seminar at University of Illinois Urbana Champaign. Remote, Champaign, Illinois. November 15, 2021. This was a seminar at a top ranked graduate program in my field.
11. **Miller, S.A.** (2021). “Environmental sustainability of cementitious materials – greenhouse gas emissions and beyond.” Invited Seminar at University of Miami. Remote, Miami, FL, November 5, 2021. This was a seminar at a top ranked graduate program in my field.
10. **Miller, S.A.** (2021). “Decarbonizing cement and cement-based systems.” Danish Energy Agency, presentation given in Davis, California, October 27, 2021. Invited presentation for part of an invitation-only targeted conference on industrial decarbonization run by the Energy and Efficiency Institute.
9. **Miller, S.A.** (2021). “Global GHG from construction materials and the role of life cycle engineering to mitigate impacts.” Materials and value chains for sustainable, inclusive, and resilient urbanisation in Africa, Remote, January 23, 2021. Invited presentation for a conference run by The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM), a highly prestigious international construction materials organization.
8. **Miller, S.A.** (2020). “Co-Benefits and Unintended Consequences of Striving for Carbon-Neutral Cement.” Gordon Research Seminar, Concrete Solutions Towards Carbon Neutral Construction by 2050, Ventura, California, February 22, 2020. The keynote talk for a Gordon Research Seminar, which are considered to be among the most prestigious in the applied sciences. (*Keynote Presentation*).

7. **Miller, S.A.** (2020). “Environmentally Sustainable Engineered Materials and Systems”, University of California Berkeley, Structural Engineering, Mechanics and Materials Seminar, Berkeley, California, February 10, 2020. This was a seminar at a top ranked graduate program in my field.
6. **Miller, S.A., & P.R. Cunningham** (2019). “Making Concrete with Post-consumer Carpet Calcium Carbonate (PC4).” Carpet America Recovery Effort California Meeting. Sacramento, California, July 30, 2019. Invited presentation targeted at science-technology transfer to increase material circularity and minimize waste.
5. **Miller, S.A.** (2019). “Technologies and processes that reduce cement pollution today and in the near future.” California Cement Forum, San Francisco, California, June 28, 2019. Invited presentation at a conference run by the ClimateWorks Foundation, a world renowned non-governmental organization focused on climate change mitigation.
4. **Miller, S.A.** (2018). “Cement and Concrete: Mitigating CO<sub>2</sub> Emissions.” Aspen Global Change Institute and the Hewlett Foundation, Aspen, Colorado, November 11–16, 2018. Invited presentation that was part of an invitation-only targeted conference on industrial decarbonization run by the Aspen Global Change Institute, a prominent organization targeted at forging interdisciplinary dialogues to solve global problems.
3. **Miller, S.A.** (2015). “Promoting diversity and inclusion: recent experience and future plans.” Invited Seminar at University of California, San Diego. March 15, 2015. Invited talk given at the Jacobs School of Engineering for an event focused on diversity, equity, and inclusion.
2. **Miller, S.A., & A. Horvath.** (2015). “Concrete and interdependent design factors for improved sustainability.” United Nations Environmental Programme SBCI Working Group on Low-CO<sub>2</sub> Eco-efficient Cement-based Materials. Beijing, People’s Republic of China. October 17, 2015. Invited presentation that was part of the initial stages of the now ongoing UNEP Low-CO<sub>2</sub> Cements Initiative to provide foundational context on assessing global greenhouse gas emissions from materials production.
1. **Miller, S.A.** (2014). “Multi-criteria constituent selection in bio-based composites using creep properties.” Invited Seminar at University of California, Berkeley. Berkeley, California. November 10, 2014. This was a seminar for a top ranked graduate program in my field.

## SELECTED OTHER PRESENTATIONS

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43. **S.A. Miller.** “Decarbonizing high-emissions materials—challenges and opportunities for cement, steel, plastics and bricks.” Materials Decarbonization and Sustainability Center Quarterly Webinar Series, Davis, CA. October 29, 2024. (*Presentation*)
42. Bose, B., T.P. Hendrickson, S.L. Nordahl, S. Kane, **S.A. Miller**, & C.D. Scown. “A decision-making tool to simplify data requirement for life cycle assessment of timber-based structural materials.” International Symposium on Sustainable Systems and Technology – ISSST 2024, Baltimore, MD. June 18, 2024 (*Presentation*)
41. J.A. Olsson, P.R. Cunningham, & **S.A. Miller** (2024) “Mitigation through the full life cycle” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. (*Presentation*)
40. J. Fan, E. Van Roijen, S. Kane, & **S.A. Miller** (2024) “Quantitative methods for materials assessment” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. (*Presentation*)
39. **S.A. Miller** (2024) “Materials production and life cycle impact assessment” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. (*Presentation*)
38. A. Martínez, J. Olsson, A. Kim, & **S.A. Miller** (2024) “Decarbonization strategies for the embodied carbon of a warehouse” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. (*Poster*)
37. P. Colligan, E. Van Roijen, S. Kane, & **S.A. Miller** (2024) “Include the externalized cost of materials, incentivize decarbonization” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. (*Poster*)

36. J. Fan, A. Martínez, A. Amitani, & **S.A. Miller** (2024) “Machine learning to predict life cycle inventory flows: initial work on biochar” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. *(Poster)*
35. J.A. Olsson, E. Van Roijen, P.R. Cunningham, & **S.A. Miller** (2024) “Lifecycle decisions to reduce CO<sub>2</sub> emissions of Portland cement” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. *(Poster)*
34. C. King, E. Van Roijen, & **S.A. Miller** (2024) “Carbon storage in non-structural building materials” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. *(Poster)*
33. J. Fan, P.R. Cunningham, C. Schultz, S. Kane, & **S.A. Miller** (2024) “Agricultural resources in concrete: properties and environmental impacts” Industrial Decarbonization Solutions Symposium, Davis, CA. April 16, 2024. *(Poster)*
32. P.R. Cunningham, & **S.A. Miller** (2024) “Shifting energy sources decreases fly ash generation up to 50% by 2030: modeling fly ash production from 2022–2050” Advanced Materials for Sustainable Infrastructure Development (GRS)—Exploring Emerging Technologies for Reducing Carbon Emissions, Ventura, CA. February 24, 2024. *(Poster)*
31. J.A. Olsson, **S.A. Miller**, & J. Kneifel, (2024) “A review of the life cycle assessment methodology for cement and concrete evaluation” National Institute of Technology Low Carbon Cements and Concretes Consortium, Remote. February 15, 2024. *(Presentation)*
30. S. Kane, & **S.A. Miller**. (2024) “A predictive pyrolysis life cycle assessment tool” North American Biochar Conference, Sacramento, CA. February 13, 2024. *(Presentation)*
29. J. Fan, & **S.A. Miller**, (2023) “Life cycle assessment methods and criteria in sustainable concrete design” American Concrete Institute Convention, Boston, MA. October 29, 2023. *(Presentation)*
28. Kim, A., Van Roijen, E. & **S.A. Miller**, (2023) “The environmental impacts of transitioning from fossil-based to agricultural-based feedstocks for cement” 11th International Conference on Industrial Ecology (ISIE2023), Leiden, Netherlands, July 4, 2023. *(Presentation)*
27. Van Roijen, E. & **S.A. Miller**, (2023) “Reducing Greenhouse Gas Emissions through Effective Waste Management in a 100% Bio-Based Plastic Market” 11th International Conference on Industrial Ecology (ISIE2023), Leiden, Netherlands, July 3, 2023. *(Presentation)*
26. **Miller, S.A.** (2023) “Engineering our way out of environmental harm” The University of California Washington Center Inaugural Change the World through Research Conference, Washington DC, June 21, 2023. *(Presentation)*
25. Kane, S., E. Van Roijen, **S.A. Miller**, & C. Ryan, (2022) “Biochar as a filler material in plastics: Reducing plastics environmental impacts and reusing waste.” The American Chemical Society Fall Meeting 2022, Chicago, IL, August 22, 2022. *(Poster)*
24. Kim, A. P.R. Cunningham, & **S.A. Miller**, (2022) “Environmental impacts of alkali-activated materials determined by adapting an open-source tool.” The American Ceramics Society (ACerS) Cements 2022, Irvine, CA, July 12, 2022. *(Presentation)*
23. **Miller, S.A.** (2021). “Concurrent engineering of food, energy, and material systems”, NSF-sponsored Convergence Accelerator workshop: Sustainable Systems Enabling Food Security in Extreme Environments and Food Deserts employing a Convergence of Food, Energy, Water and Systems, May 19–21, 2021. *(Remote Presentation)*.
22. **Miller, S.A.** (2021). “Life Cycle Environmental Impact Considerations for Structural Concrete in Transportation Infrastructure”, International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020, January 12, 2021. *(Remote Presentation)*.

21. **Miller, S.A.** (2020). "Creating an inclusive environment for fundamental undergraduate solid mechanics-based engineering courses", 2020 Scholarship of Teaching and Learning Conference, December 1, 2020. (*Remote Poster*).
20. **Miller, S.A.** (2020). "Mitigating greenhouse gas emissions from cement-based materials: Example strategies considered for California", Gordon Research Conference, Cutting-Edge Developments and Characterization of Cement-Based Materials, Ventura, California, February 25, 2020. (*Poster*).
19. **Miller, S.A.** (2018). "Quantifying the potential environmental impact benefits of bio-derived polymers in bio-based composites for construction." Society of Environmental Toxicology and Chemistry Annual Meeting. Sacramento, California, November 5–8, 2018. (*Presentation*)
18. **Miller, S.A.** (2018). "Quantifying the effects of mitigation strategies on reducing the environmental impacts of concrete." American Concrete Institute Convention, Las Vegas, Nevada. October 13–17, 2018. (*Presentation*)
17. **Miller, S.A.** (2017). "The role of energy decisions on the water consumption of concrete infrastructure." International Society of Industrial Ecology 9<sup>th</sup> Biennial Conference, Chicago, Illinois. June 25–29, 2017. (*Presentation*)
16. **Miller, S.A.** (2017). "Using structural design and applications to inform environmental impact assessments of infrastructure materials." Structures Congress, Structural Engineering Institute of the American Society of Civil Engineers. Denver, Colorado. April 6–8, 2017. (*Presentation*)
15. **Miller, S.A.** (2016). "How concrete design and durability can be used in life-cycle assessments to provide more robust quantification of environmental impacts." American Concrete Institute Convention. Philadelphia, Pennsylvania. October 23–27, 2016. (*Presentation*)
14. **Miller, S.A.** (2015). "Engineering sustainable infrastructure materials: how concrete design can influence global warming potential." University of California President's Postdoctoral Fellowship Program Retreat. Lake Arrowhead, California. April 23–25, 2015. (*Presentation*)
13. **Miller, S.A., S.L. Billington, & M.D. Lepech.** (2014). "Linking durability and environmental impact in material design." Gordon Research Conference: Transforming the Industrial Metabolism. Lucca, Italy. June 1–6, 2014. (*Poster – runner up for best poster*)
12. **Miller, S.A., M.D. Lepech, & S.L. Billington.** (2014). "Multi-criteria constituent selection in biobased composites for construction applications using creep properties." The 13<sup>th</sup> International Symposium on Bioplastics, Biocomposites & Biorefining. Guelph, Canada. May 19–24, 2014. (*Presentation*)
11. **Miller, S.A. & S.L. Billington.** (2013). "Effect of fiber-matrix compatibilization techniques on the creep behavior of PHBV/wood flour biobased composites." American Institute of Chemical Engineers Annual Meeting. San Francisco, CA. November 3–8, 2013. (*Presentation*)
10. **Miller, S.A., M.D. Lepech, & S.L. Billington.** (2013). "Prediction of creep behavior of biobased composites." Engineering Mechanics Institute Conference. Evanston, IL. August 4–7, 2013. (*Presentation*)
9. **Miller, S.A., M.D. Lepech, & S.L. Billington.** (2013). "Biobased composite design through multi-criteria material selection for reduced embodied energy." Conference on Energy Efficiency and Smart Energy. Stanford, CA. May 16, 2013. (*Poster*)
8. **Srubar III, W.V., S.A. Miller, & S.L. Billington.** (2013). "Service Life Prediction of Fully Biorenewable Wood-Plastic Composites: A Spatiotemporal Approach." Service Life Prediction of Polymeric Materials: Vision for the Future. Conference Presentation. Monterey, California, USA. 4 March 2013. (*Presentation*)
7. **Miller, S.A., M.D. Lepech, & S.L. Billington.** (2013). "Considering environmental impact in material design." Blume Earthquake Engineering Center Affiliates Meeting. Stanford, CA. February 1, 2013. (*Poster*)
6. **Miller, S.A. & S.L. Billington.** (2012). "Creep and aging of PHBV-natural fiber composites." American Institute of Chemical Engineers Annual Meeting. Pittsburgh, PA. Oct. 28–Nov. 2, 2012. (*Presentation*)



5. Billington, S.L., W.V. Srubar III, & **S.A. Miller**. (2012). "Predicting the Service Life of Biobased Composites for Green Construction." 20th BioEnvironmental Polymer Society Annual Meeting. Toronto, Ontario, Canada. 18 September 2012. (*Presentation*)
4. **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2012). "Application of industrial ecology principles to design materials for the built environment." Gordon Research Conference: The Role of Industrial Ecology in Addressing Sustainability Imperatives. Les Diablerets, Switzerland. June 17–22, 2012. (*Poster*)
3. **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2012). "Using industrial ecology principles to design materials for construction." Gordon Research Seminar: Addressing the Challenges of Sustainable Development. Les Diablerets, Switzerland. June 16–17, 2012. (*Presentation*)
2. Billington, S.L., **S.A. Miller**, & M.D. Lepech. (2012). "How green are biobased composites?" 12<sup>th</sup> International Conference on Biocomposites Niagara Falls, Ontario, Canada. May 6–8, 2012. (*Presentation*)
1. **Miller, S.A.**, M.D. Lepech, & S.L. Billington. (2012). "Closing the material loop: a teaching module for high school seniors and undergraduate students." Materials Education Symposia. San Luis Obispo, CA. March 29–30, 2012. (*Poster*)

## MENTORING & RESEARCH SUPERVISION

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### Post-doctoral scholars

Dr. Ning Zhang, *March 2025–ongoing*, postdoctoral research topic: "Electrification and circularity methods to reduce greenhouse gas emissions from cement-based composites."

Dr. Jin Fan, *July 2023–ongoing*, postdoctoral research topic: "Determining pathways to creating carbon sequestration in the built environment."

Dr. Seth Kane, *September 2022–ongoing*, postdoctoral research topic: "Using first-principles to determine life cycle inventories of novel materials in data-poor environments."

Dr. Sonoko Ichimaru, *March 2020–December 2020*, postdoctoral research topic: "Using structural design principles to inform material efficiency for reinforced concrete design."

### Ph.D. students

Asahi Amitani, *ongoing research*, doctoral research topic: "Integrating data science and life cycle assessment methods to assess alternative supplementary cementitious materials."

Kelli Knight, *ongoing research*, doctoral research topic: "A framework for understanding best-practice methodologies to mitigate environmental damages from building material production and use."

Josefine Olsson, *advanced to candidacy 2024*, doctoral research topic: "Integrating structural performance into environmental impact metrics to support comparison of building materials."

Alyson Kim, *graduated 2024*, doctoral research topic: "A Comprehensive Approach to Industrial Decarbonization Efforts Within the Building Materials Sector."

Elisabeth van Roijen, *graduated 2024*, doctoral research topic: "Developing a Framework for Achieving Global Carbon Dioxide Removal with Bio-Based Plastics."

Patrick Cunningham, *graduated 2024*, doctoral research topic: "A Framework for Considering Resource Availability, Experimental Performance, and Environmental Impacts to Advance Alternative Mineral Admixtures."

Kanatha Kamau-Devers, *graduated 2020*, doctoral research topic: "Advancing green design of bio-based composites through durability assessment and material modeling efforts."

### M.S. students

Mayzee Supak, *ongoing research*, research topic: "Performance characteristics of low-carbon non-structural building materials."

Julia Doyle-Uebel, *ongoing research*, research topic: “Circularity methods for construction materials to reduce greenhouse gas emissions.”

Camille King, *graduated 2024*, research topic: “Engineering bioplastics to mitigate environmental damages in growing plastics markets.”

Kristen Stilin, *graduated 2024*, research topic: “Embodied carbon in thermal barriers and novel insulation materials.”

Cameron Schulz, *graduated 2024*, research topic: “Using fiber-reinforcement to overcome performance-based and environmental impacts of cement-based materials.”

Asahi Amitani, *graduated 2024*, research topic: “Carbon-emissions and water consumption benefits from concrete aggregate gradation, mineral fillers, and chemical additives.”

Andres Martinez, *graduated 2024*, research topic: “Barriers and benefits to using geopolymers in data centers.”

Zerin Alam, *graduated 2023*, research topic: “Spatiotemporal and economic variation in implementation of decarbonization policy measures.”

Kelli Knight, *graduated 2022*, research topic: “Multi-objective optimization for concrete mixture proportioning to mitigate GHG emissions and other environmental burdens concurrently.”

Daniel Tran, *graduated 2022*, research topic: “Additive manufacturing methods for biocements.”

Alyson Kim, *graduated 2022*, research topic: “A systematic and unified method for determining the environmental impacts of concrete.”

Kati Sethares, *graduated 2022*, research topic: “Understanding how Environmental Product Declarations (EPDs) can be adapted or supported to inform policy measures for decarbonizing materials.”

Leah Brinkman, *graduated 2021*, research topic: “Production of industrial supplementary cementitious materials: Environmental impacts and environmental justice implications.”

Josefine Olsson, *graduated 2020*, research topic: “The role of engineering design decisions on mitigating GHG emissions from reinforced concrete structures.”

Patrick Cunningham, *graduated 2018*, research topic: “The environmental impacts of alkali-activated materials.”

Chao Fan, *graduated 2017*, research topic: “Reducing greenhouse gas emissions for prescribed concrete compressive strength.”

### **Undergraduate researchers**

Michael Dell'Aquila, *ongoing, expected graduation 2027*

Paikea Colligan, *ongoing, expected graduation 2026*

Rachel Reimer, *ongoing, expected graduation 2026*

Helena Kwon, *ongoing, expected graduation 2025*

Sarah Graessley, *ongoing, expected graduation 2025*

Melane Pham, *graduated 2024*

Gavin Chaboya, *graduated 2023*

Cameron Schultz, *graduated 2023*

Hang Yu, summer researcher (*degree from University of Illinois Champaign Urbana, graduated 2021*)

Justin Caverly, *graduated 2020*

Van Willem Peralta, *graduated 2020*

Audrey Florman, *graduated 2020*

Zachary Kortum, summer researcher (*degree from Rice University, graduated 2019*)

Angani Vigneswaran, *graduated 2020*

Haoting Pan, *graduated in 2019*

Jacob Newman, *graduated 2019*

Valerie Yanez, *graduated 2019*

Darren Easterling, *graduated 2017*

## GRANT SUPPORT

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Amount awarded: \$10.9 million; Amount awarded as lead or sole PI: \$5.5 million

**California Air Resources Board.** Technical Feasibility, Cost-effectiveness, and Policy Strategies for Reducing Embodied Carbon in Building Materials. Grant No. 23STC019, 06/01/24 – 05/31/26, \$608,000 (**Co-PI**; Lead-PI Arpad Horvath, UC Berkeley)

**Department of Transportation.** The Center for Emissions Reduction, Resiliency, and Climate Equity in Transportation (CERRCET). Grant No. A24-3016, 06/01/24 – 5/31/24, \$1,700,000 (**Co-I**; Lead-PI Kari Watkins, UC Davis)

**Carpet America Recovery Effort.** Recycled carpet-based aggregate: preliminary investigation of properties and environmental impacts. Grant No. CCSP-2ID24-001, 09/01/24 – 08/31/25, \$125,000 (**Lead PI**)

**Resnick Agricultural Innovation Research Fund.** Almond-Cem: Super low carbon binder for housing, pipelines and street applications. 05/01/2024 – 04/30/2025, \$519,726, (**Co-PI**; Lead-PI Somayeh Nassiri, UC Davis)

**Department of Defense, Environmental Security Technology Certification Program.** Life-Cycle Greenhouse Gas and Cost Modeling for Reducing Emissions in Defense Buildings. 03/01/24 – 02/28/27, \$2,213,690 (**Co-PI**; Lead-PI Jennifer Stokes-Draut, LBNL)

**University Transportation Center – California Department of Transportation.** Developing a framework for the assessment and implementation of innovative concrete construction materials. Grant No. 65A686 - TO 84, 01/1/2024 – 12/31/2024, \$100,000 (**Co-PI**; Lead-PI Somayeh Nassiri, UC Davis)

**Sandia National Laboratory.** Understanding Environmental Burdens and Unintended Consequences in the Production of Advanced Materials from Waste Resources. Grant No. TO: 2563522, 01/01/24 – 09/30/24, \$45,000 (**Sole PI**)

**Department of Defense, Army Engineer Research and Development Center.** Adaptable and Dynamic Models for the Carbonation of Concrete. Grant No. W912HZ239C015, 01/01/24 – 12/30/25, \$431,289 (**Sole PI**)

**National Center for Sustainable Transportation – California Department of Transportation.** Utilizing concrete at its end-of-life for direct air capture. Grant No. 65A0686 - TO 077, 06/01/23 – 05/31/24, \$119,414 (**Sole PI**)

**National Institute of Standards and Technology.** Life Cycle Assessment of Low Carbon Concrete. 04/01/23 – 08/31/24, \$100,009 (**Sole PI**)

**Resnick Agricultural Innovation Research Fund.** Demonstration of a Pathway to Construction Market for California's Almond Coproducts. 04/01/23 – 03/31/24, \$206,211 (**Co-PI**; Lead-PI Somayeh Nassiri, UC Davis)

**University of California Office of the President.** California Center for Green Buildings Research. Grant No. M23PL6005, 01/01/23 – 12/31/24, \$300,000 (**Co-PI**; Lead-PI Arpad Horvath, UC Berkeley)

**Google Inc.** GHG Reduction Potential in DC Building Materials. 10/01/22 – 12/31/24, \$543,924 (**Sole PI**)

**University of California Davis, New Research and Scholarship Initiatives and Collaborative Interdisciplinary Research.** Diatom-based Cement Composites coupled with Wastewater Remediation to Reduce CO<sub>2</sub> Emissions. 09/01/22 – 09/30/23, \$24,998 (**Co-PI**; Lead-PI Annaliese Franz, UC Davis)

**Department of Energy, ARPA-E.** Carbon Negative Materials Assessment (CaNMA). Grant No. DE-AR0001625, 09/01/22 – 09/30/24, \$1,602,564 (**Lead PI**)

**National Science Foundation.** CAREER: Engineering greenhouse gas-sequestering infrastructure materials through integrated life cycle and material performance analysis. Grant No. CBET-2143981, 07/01/22 – 06/30/27, \$508,304 (**Sole PI**)

*This is considered to be one of the most prestigious federally granted early career awards.*

**California Air Resources Board.** Study of barriers to cement sector net-zero emissions strategy to support SB-596 implementation. Grant No. 3900-21ISD012, 04/01/22 – 03/31/23, \$144,466 (**Sole PI**)

**ClimateWorks Foundation.** Science to Support Policy Pathways for Industrial Decarbonization of Cement and Concrete. 01/01/22 – 12/31/22, \$90,000 (**Sole PI**)

**US Endowment of Forestry and Communities.** Cellulose Nanocrystals as a Value-Based Additive for Low Carbon Footprint Concrete with Limestone. 01/01/22 – 12/31/22, \$70,745 (**Co-PI**; Lead-PI Jason Weiss, OSU)

**WiSTEM<sup>2</sup>D Scholars Award from the Johnson & Johnson Foundation.** Manufacturing methods to create carbon-sequestering plastics. 10/01/21 – 09/30/24, \$150,000 (**Sole PI**).

*This was an international call and grants were awarded to less than 1% of applicants*

**National Science Foundation.** NSF2026: EAGER: Carbon-sink infrastructure materials to create net-negative carbon emitting energy systems. Grant No. CBET- 2033966, 10/01/20 – 09/30/23, \$256,128 (**Lead PI**)

*Grants for this call were awarded to fewer than 3% of applicants*

**Natural Resources Defense Council and ClimateWorks Foundation.** Industrial Decarbonization: Technical & Policy Pathways for the Cement Sector. Grant No. A21-2618, 10/01/20 – 09/30/21, \$275,000 (**Lead PI**)

**US Endowment of Forestry and Communities.** Examining the use of cellulose nano-materials in slip formed concrete applications. Grant No. J2460A-A, 07/01/20 – 06/30/21, \$20,674 (**Co-PI**; Lead-PI Jason Weiss, OSU)

**Carpet America Recovery Effort.** The effects of minor treatments to CaCO<sub>3</sub> from recycled carpet on its feasibility for use in concrete. 04/01/20 – 09/30/21, \$113,420 (**Lead PI**)

**National Center for Sustainable Transportation – California Department of Transportation.** Transformation of Engineering Tools to Increase Material Efficiency of Concrete. Grant No. 654A0686 - TO 027, 01/01/20 – 09/30/21, \$94,554 (**Sole PI**)

**National Center for Sustainable Transportation – California Department of Transportation.** Benchmarking GHG Emissions from California Concrete Production and Readily Implementable Mitigation Methods. Grant No. 654A0686 - TO 026, 01/01/20 – 09/30/21, \$94,554 (**Sole PI**)

**Carpet America Recovery Effort.** Applications in Concrete of CaCO<sub>3</sub> from Recycled Carpet. 04/01/19 – 03/31/20, \$95,400 (**Lead PI**)

**American Public Works Association.** APWA Resilient Infrastructure Materials Laboratory. 01/01/19 – 12/31/19, \$25,000 (**Sole PI**)

**California Rice Research Board.** Comprehensive Feasibility Assessment for the Use of Rice Ash in Concrete. Grant No. RR19-7 RU-14, 06/30/18 – 12/31/23, \$156,589 (**Lead PI**)

**President's Postdoctoral Fellowship Program, University of California Office of the President.** 06/01/16 – 06/30/21, \$535,000 (**Sole PI**)

## TEACHING EXPERIENCE

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|  |           |
|--|-----------|
| <b>Professor, Cement Composites (ECI 235)</b><br><b>University of California, Davis</b><br>Elective graduate level course<br><i>enrollment: 5-20 students; average teaching effectiveness: 4.5/5</i>   | 2017–2024 |
| <b>Professor, Community Engagement and Sustainability in Engineering (ECI 189)</b><br><b>University of California, Davis</b><br>Elective undergraduate level course<br><i>enrollment: 10 students; average teaching effectiveness: 5.0/5</i>           | 2023      |
| <b>Professor, Structure and Properties of Civil Engineering Materials (ECI 133)</b><br><b>University of California, Davis</b><br>Elective undergraduate level course<br><i>enrollment: 50-70 students; average teaching effectiveness: 4.3/5</i>       | 2021–2023 |
| <b>Professor, Designing Materials for Sustainability (ECI 239)</b><br><b>University of California, Davis</b><br>Elective graduate level course<br><i>enrollment: 5-20 students; average teaching effectiveness: 4.8/5</i>                              | 2018–2023 |
| <b>Professor, Mechanics of Materials (ENG 104)</b><br><b>University of California, Davis</b><br>Required undergraduate level course for students in multiple departments<br><i>enrollment: 100-200 students; average teaching effectiveness: 4.1/5</i> | 2017–2020 |
| <b>Lecturer, Buildings and Sustainability (CEE 298)</b><br><b>University of California, Berkeley</b><br>Elective graduate level course<br><i>enrollment: 20 students; average teaching effectiveness: 4.8/5</i>  | 2015      |

## LEADERSHIP, SERVICE, AND SYNERGISTIC ACTIVITIES

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**Founding Director of the Materials Decarbonization and Sustainability Center:** In late 2023, I established a new research center at UC Davis focused on transforming scientific knowledge into actionable solutions for materials decarbonization and environmental sustainability. Structured to be funded by an industry consortium, the center collaborates with government agencies and non-profits to support decision-making and policy development. During this first year, I have actively engaged with stakeholders to secure support and expand awareness, I received specialized university training in building academic-industry partnerships, and I created new staff positions to advance the center's mission. My vision is to create an internationally recognized center that will focus on: (i) carbon dioxide removal; (ii) circularity; (iii) sustainable manufacturing; (iv) engineering food, energy, and materials systems; (v) resource scarcities and value chains; (vi) life cycle analysis.

### Editorial Boards, Committees, & Scientific Working Groups

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| Member, Office of the Special Presidential Envoy for Climate, U.S.-China Working Group on Enhancing Climate Action | 2024 |
| Conference co-organizer, Industrial Decarbonization Symposium  | 2024 |



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| Voting Member, American Concrete Institute Committee 323: Low Carbon Concrete Code   | 2023–present |
| Member, Building Transparency Carbonation Working Group<br><i>Developing a method to assess concrete carbonation with the group responsible for EC3</i>  | 2023–present |
| Institute of Physics (IOP): Environmental Research: Infrastructure and Sustainability<br><i>Executive Editorial Board Member</i>   | 2022–present |
| Voting Member, American Concrete Institute Committee 130: Sustainability of Concrete   | 2016–present |
| Working Group Member, United Nations Environment Programme<br><i>UNEP Sustainable Buildings and Climate Initiative Working Group on Low-CO<sub>2</sub> Eco-efficient Cement-based Materials</i>  | 2015–present |
| Associate Member, American Concrete Institute Committee 236: Materials Science of Concrete   | 2014–present |
| Session chair, American Ceramics Society: Advances in Cement-Based Materials in Irvine, July 11-13<br><i>Session title: Supplementary and Alternative Cementitious Materials, Part 2 of 3</i>    | 2022         |
| Session chair, The Corvallis Workshops: Concrete Fit for Purpose and Planet in Corvallis, June 22-24<br><i>Session title: Concrete/Pre-Cast</i>  | 2022         |
| Organizer, Greening Cement: A Primer on Technologies and Policies to Support California's Transition to Low-GHG Cement Workshop  | 2021         |
| Institute of Physics (IOP): Environmental Research: Infrastructure and Sustainability<br><i>Editorial Board Member</i>   | 2020–2022    |
| Session chair, Society of Environmental Toxicology and Chemistry in Sacramento, November 4-8<br><i>Session title: Advancements in Green Infrastructure Systems through Life Cycle Assessment</i> | 2018         |
| Session chair, American Concrete Institute Convention in Philadelphia October 23-27<br><i>Session title: Using service life in understanding environmental impacts</i>                           | 2016         |
| Associate Member, American Concrete Institute Committee 130: Sustainability of Concrete  | 2014–2016    |

### **Outreach & Promoting Inclusivity in STEM**

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|--|--------------|
| Graduate Students of Color (GSoC) Mentor<br><i>UC Davis program to support historically underrepresented graduate student populations</i>                  | 2020–present |
| LEADR Civil Engineering Lecturer<br><i>UC Davis, College of Engineering Leadership in Engineering Advancement, Diversity and Retention (LEADR) program</i> | 2019–present |
| STEM Highschool Teacher Training<br><i>Mathematics Engineering Science Achievement (MESA) Schools Program</i>  | 2019         |
| STEM Community College Engagement Workshop & Laboratory Tours<br><i>Mathematics Engineering Science Achievement (MESA) Schools Program</i>                 | 2019         |
| AvenueE Mentor<br><i>UC Davis, College of Engineering program for transfer students</i>  | 2018–present |
| Faculty reviewer for the UC President's Postdoctoral Fellowship Program  | 2017         |

### **Department, College, University, and UC System Service**

|  |              |
|--|--------------|
| Faculty Director for the Materials Decarbonization and Sustainability Center         | 2023–present |
| Department of Civil and Environmental Engineering Computer Committee                 | 2023–present |
| Construction Engineering & Management Minor advisor                                  | 2023–present |
| Department of Civil and Environmental Engineering Undergraduate Curriculum Committee | 2022–203     |

|  |              |
|--|--------------|
| Faculty Director for the Materials Decarbonization and Sustainability Program                      | 2023–present |
| Department of Civil and Environmental Engineering ad hoc committee for laboratory instructor staff | 2021         |
| Industrial Ecology Program faculty affiliate   | 2021–present |
| Guest lecturer for Transfer Transition Course at UC Davis  | 2019         |
| Guest lecturer for Buildings and Sustainability at UC Berkeley (CEE 298), 2 lectures               | 2018         |
| Sustainability in the Built Environment Minor advisor  | 2017–present |
| Guest lecturer for Civil Infrastructure and Society at UC Davis (ECI 3)                            | 2016         |
| Department of Civil and Environmental Engineering Computer Committee                               | 2016–2022    |

### **Reviewer of Scholarly Works**

|   |                        |
|---|------------------------|
| Peer reviewer for the Department of Energy  | 2023                   |
| Ad hoc reviewer for the Alfred P. Sloan Foundation  | 2022                   |
| Peer reviewer of technical reports for the World Resources Institute  | 2022                   |
| Peer reviewer for the National Science Foundation   | 2018, 2021, 2022, 2023 |
| Peer reviewer of technical reports for the ClimateWorks Foundation  | 2020                   |
| Peer reviewer for the International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020     | 2020                   |
| Peer reviewer for research funding by Instituto Serrapilheira, Brazil   | 2017                   |
| Peer reviewer for The Engineering and Physical Sciences Research Council funding agency of the United Kingdom | 2015                   |

### ***Journals Refereed:***

Nature  
 Environmental Science & Technology  
 Science  
 Proceedings of the National Academy of Sciences  
 Nature Review Materials  
 Sustainable Production and Consumption  
 Environmental Research: Infrastructure and Sustainability  
 Cement  
 Journal of Industrial Ecology  
 ASCE Journal of Materials in Civil Engineering  
 Nature Communications  
 Environmental Research Letters  
 Journal of Polymers and the Environment  
 International Journal of Life Cycle Assessment  
 Cement and Concrete Composites  
 Construction and Building Materials  
 Resources Conservation and Recycling  
 Journal of Renewable Materials  
 ASCE Journal of Infrastructure Systems  
 Journal of Cleaner Production

### **Membership in Professional Organizations**

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|-------------------------------------|--------------|
| American Society of Civil Engineers | 2014–present |
| American Concrete Institute         | 2014–present |

## Pro bono consulting

As part of my service efforts, I provide consulting free of charge to a variety of not-for-profit, state, and federal organizations as well as for some companies. These consulting hours are typically on methods to assess environmental impacts of producing building materials, feasibility of novel building materials, and industrial decarbonization pathways. I work with these groups on an as-needed basis and work with these groups is ongoing. Selected pro bono consulting efforts are listed below.

- Project 2030 – policy advocacy group working to encourage low-GHG technology transitions; the focus of my consulting on feasibility of mechanisms to achieve desired GHG emissions by target dates.
- California Nevada Cement Association – non-profit organization that promotes sustainability in western US cement production; the focus of my consulting is on mechanisms to reduce GHG emissions from cement production while limiting unintended consequences.
- California Energy Commission – state agency; the focus of my consulting has been to provide feedback and perspective on low-GHG emissions materials investment proposals for the State.
- United States Environmental Protection Agency (US EPA) Office of Policy – federal organization; the focus of my consulting on mechanisms to reduce GHG emissions through material selection without causing disproportionate impacts.
- State and Federal Representatives – several state and federal representatives interested in emissions from building materials production; the focus of my consulting has included discussions with climate staffers for US Senator Bernie Sanders, California State Senator Josh Becker, and California Assembly Member Chris Holden.
- World Resources Institute – non-governmental organization; the focus of my consulting has been on methods to perform industrial decarbonization for building materials production without compromising material performance.
- Natural Resources Defense Council – non-governmental organization; the focus of my consulting has been on methods to perform industrial decarbonization for building materials production and routes to benefit policy decisions.
- National Institute of Standards and Technology – federal organization; the focus of my consulting has been on methods to perform industrial decarbonization for building materials production.
- Rocky Mountain Institute – non-governmental organization; the focus of my consulting has been on methods to perform industrial decarbonization for building materials production and routes to benefit policy decisions.
- US Energy Information Administration, National Energy Modeling System (NEMS) Group – federal organization that models energy demands and greenhouse gas emissions associated with energy and industrial demands in the United States; the focus of my consulting has been on methods to assess emissions from cement production, scope boundaries for novel cements, and methods to decarbonize cement production.
- Breakthrough Energy Ventures – venture investment group initiated by Bill Gates to invest in technologies to meet net-zero GHG emissions; the focus of my consulting has been on feasibility of technology proposals to achieve desired material performance and/or lower GHG emissions.
- West Biofuels – bioenergy group that works to utilize woody biomass in electricity, methanation, and other fuel generation; the focus of my consulting has been on mechanisms to drive down environmental impacts of production, focusing on processes and hotspots, and the utilization of residual minerals and biochar to create uptake mechanisms.
- Brimestone – cement startup company that works on using non-limestone resources to produce cement; the focus of my consulting has been on the environmental impacts of current cement production and resource demands to give context for their differences.