

Cuihong Song, Ph.D.

Research Assistant Professor

Department of Civil and Environmental Engineering

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Education

2020	Ph.D.	Civil and Environmental Engineering, University of New Hampshire
2015	M.S.	Environmental Engineering, University of Shanghai for Science and Technology
2012	B.S.	Environmental Engineering, Yantai University

Academic Appointments

2025-present	Research Assistant Professor	University of New Hampshire
2023-2025	Associate Research Scholar	Princeton University
2021-2023	Post-doctoral Associate	Princeton University
2020-2021	Post-doctoral Associate	University of New Hampshire
2015-2020	Research Assistant	University of New Hampshire

Peer-reviewed Publications

- Song, C.H.**, Ponder, D., Peng, W., Ren, Z. J. (2026). Inconsistent national reports undercount wastewater emissions. *Nature Climate Change*. 16, (251–252). <https://doi.org/10.1038/s41558-026-02555-7>
- Song, C.H.**, Ponder, D., Peng, W., Ren, Z. J., (2026). Discrepancy of National Inventories Reveals Significant Emission Gap in the Wastewater Sector. *Nature Climate Change*. 16, (313–321). <https://doi.org/10.1038/s41558-025-02540-6>
 - Highlighted in Nature Research Highlights. *Nature* 651, 11 (2026). <https://doi.org/10.1038/d41586-026-00514-y>
- Moore, D.P., Li, N.P., **Song, C.H.**, Zhu, J.J., Sevostianov, V.I., Wendt, L.P., Rojas, N.R., Hopkins, F.M., Ren, Z. J., & Zondlo, M.A., (2025). Greater contribution of wastewater treatment to urban greenhouse gas emissions. *Nature Water*. 3 (1114–1124). <https://doi.org/10.1038/s44221-025-00490-z>
- Song, C.H.**, Zhu, J. J., Willis, J. L., Moore, D. P., Zondlo, M. A., & Ren, Z. J. (2024). Oversimplification and misestimation of nitrous oxide emissions from wastewater treatment plants. *Nature Sustainability*, 1-11. <https://doi.org/10.1038/s41893-024-01420-9>
- Song, C.H.**, Zhu, J. J., Yuan, Z., van Loosdrecht, M. C., & Ren, Z. J. (2024). Defining and achieving net-zero emissions in the wastewater sector. *Nature Water*, 1-9. <https://doi.org/10.1038/s44221-024-00318-2>
- Yan, Y.Q, **Song, C.H. (co-first author)**, Zhu, J.J., Abbadi, S.E., Stokes-Draut, J., & Ren, Z. J., (2025). Methodology Discrepancy and Data Comparability of Greenhouse Gas Monitoring from Water Resource Recovery Facilities. *Environmental Science & Technology*, 59(25), 12567-12583. <https://doi.org/10.1021/acs.est.5c00345>

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7. Li, X., **Song, C.H.**, Abbadi, S.E., Stokes-Draut, J., & Ren, Z. J., (2025). The impact of clean grid transition on greenhouse gas emissions of water resource recovery facilities. *Environmental Science & Technology Letters*, 12(2), 144-150. <https://doi.org/10.1021/acs.estlett.4c00893>
 8. Yan, Y., Zhu, J. J., May, H. D., **Song, C.H.**, Jiang, J., Du, L., & Ren, Z. J. (2024). Methanogenic Potential of Sewer Microbiomes and Its Implications for Methane Emission. *Environmental Science & Technology*, 58(45), 19990-19998. <https://doi.org/10.1021/acs.est.4c04005>
 9. **Song, C.H.**, Zhu, J. J., Willis, J. L., Moore, D. P., Zondlo, M. A., & Ren, Z. J. (2023). Methane emissions from municipal wastewater collection and treatment systems. *Environmental Science & Technology*, 57(6), 2248-2261. <https://doi.org/10.1021/acs.est.2c04388>
 10. Zheng, S., **Song, C.H.**, Curria, M. C., Ren, Z. J., & White, C. E. (2023). Ca-Based Layered Double Hydroxides for Environmentally Sustainable Carbon Capture. *Environmental Science & Technology*, 57(45), 17212-17224. <https://doi.org/10.1021/acs.est.3c03742>
 11. Moore, D. P., Li, N. P., Wendt, L. P., Castañeda, S. R., Falinski, M. M., Zhu, J. J., **Song, C.H.**, & Zondlo, M. A. (2023). Underestimation of sector-wide methane emissions from United States wastewater treatment. *Environmental Science & Technology*, 57(10), 4082-4090. <https://doi.org/10.1021/acs.est.2c05373>
 12. **Song, C.H.**, Diessner, N. L., Ashcraft, C. M., & Mo, W. (2021). Can science-informed, consensus-based stakeholder negotiations achieve optimal dam decision outcomes? *Environmental Development*, 37, 100602. <https://doi.org/10.1016/j.envdev.2020.100602>
 13. **Song, C.H.**, & Mo, W. (2021). A temporal perspective to dam management: influence of dam life and threshold fishery conditions on the energy-fish tradeoff. *Stochastic Environmental Research and Risk Assessment*, 35(1), 83-94. <https://doi.org/10.1007/s00477-019-01726-7>
 14. Bixler, T. S., **Song, C.H.**, & Mo, W. (2021). Comparing centralized and point-of-use treatments of per-and polyfluoroalkyl substances. *AWWA Water Science*, 3(6), e1265. <https://doi.org/10.1002/aws2.1265>.
 15. Feng, D., **Song, C.H.**, & Mo, W. (2021). Environmental, human health, and economic implications of landfill leachate treatment for per-and polyfluoroalkyl substance removal. *Journal of Environmental Management*, 289, 112558. <https://doi.org/10.1016/j.jenvman.2021.112558>
 16. Guglielmi, G., Mitchell, B., **Song, C.H.**, Kinsey, B. L., & Mo, W. (2021). Life Cycle Environmental and Economic Comparison of Water Droplet Machining and Traditional Abrasive Waterjet Cutting. *Sustainability*, 13(21), 12275. <https://doi.org/10.3390/su132112275>
 17. **Song, C.H.**, O'Malley, A., Zydlewski, J., & Mo, W. (2020). Balancing fish-energy-cost tradeoffs through strategic basin-wide dam management. *Resources, Conservation and Recycling*, 161, 104990. <https://doi.org/10.1016/j.resconrec.2020.104990>
 18. **Song, C.H.**, Omalley, A., Roy, S. G., Barber, B. L., Zydlewski, J., & Mo, W. (2019). Managing dams for energy and fish tradeoffs: what does a win-win solution take? *Science of the Total Environment*, 669, 833-843. <https://doi.org/10.1016/j.scitotenv.2019.03.042>
 19. **Song, C.H.**, Gardner, K. H., Klein, S. J., Souza, S. P., & Mo, W. (2018). Cradle-to-grave greenhouse gas emissions from dams in the United States of America. *Renewable and Sustainable Energy Reviews*, 90, 945-956. <https://doi.org/10.1016/j.rser.2018.04.014>

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20. Li, L., **Song, C.H.**, Huang, Y., & Zhou, Y. (2016). Investigation of BTEX removal efficiency using the electrolytic oxidation and Fenton's reaction. *Journal of Water Chemistry and Technology*, 38, 149-157. <https://doi.org/10.3103/S1063455X1603005X>
 21. Li, L., **Song, C.H.**, Huang, Y., & Zhou, Y. (2015). Enhanced electrolytic removal of ammonia from the aqueous phase with a zeolite-packed electrolysis reactor under a continuous mode. *Journal of Environmental Engineering*, 141(2), 04014056. [https://doi.org/10.1061/\(ASCE\)EE.1943-7870.0000890](https://doi.org/10.1061/(ASCE)EE.1943-7870.0000890)
 22. Huang, Y., **Song, C.H.**, Li, L., & Zhou, Y. (2014). The mechanism and performance of zeolites for ammonia removal in the zeolite packed electrolysis reactor. *Electrochemistry*, 82(7), 557-560. <https://doi.org/10.5796/electrochemistry.82.557>
 23. Huang, Y., Li, L., & **Song, C.H.**, (2013). Effect of nitrogen and phosphorus levels on the lipid production of *Chlorella vulgaris* and evaluation of ultrasound-assisted lipid extraction. *Fresenius Environmental Bulletin*, 22(10), 2848-2854.

Submitted manuscript

24. Zhu, J. J., Jiang, J.Y., Yang, M.Q., Lin, D., **Song, C.H.**, Iavelan V., Ren, Z. J., Knowledge-Infused Language Models for the Water and Sustainability Domain. Manuscript submitted to *Nature Water*.
25. Abbadi, S. E., Le, T., Hodson, A.R., Sherwin, E.D., Jamison, J., **Song, C.H.**, Ren, Z. J., Stokes-Draut, J., Evaluating economic opportunities and challenges for energy recovery from fugitive methane in wastewater treatment. Manuscript submitted to *Environmental Science & Technology*.

Grants

Internal at UNH (Lead PI)

Seed Funding for Sustainability-Related Research & Curriculum, “*AI-enabled, Data-Driven Assessment of Distributional Equity in Nature-Based Solution Deployment*”, 2025-2026

External (Co-Investigator)

Water Research Foundation, “*Developing a Greenhouse Gas Emissions Library for Unit Processes by Water Utilities and Decentralized Systems (Project #5255)*”, 2024-2027

Water Research Foundation, “*Advancing the Understanding of Nitrous Oxide Emissions Through Enhanced Whole-Plant Monitoring and Quantification (Project #5251)*”, 2024-2027

Teaching Experience

2025 Fall	University of New Hampshire	CEE 706/806 Environmental Life Cycle Assessment (lecturer)
2025 Spring	Princeton University	CEE599 Pathways to Water Sector Decarbonization (co-instructor)
2023 Spring	Princeton University	CEE599 Pathways to Water Sector Decarbonization (co-instructor)
2020 Spring	University of New Hampshire	CEE 907 System Analysis of the Environment (guest lecturer)
2019 Fall	University of New Hampshire	CEE 705/805 Intro Sustainable Engineering

		(guest lecturer)
2019 Summer	University of New Hampshire	Training: Graduate Certificate in Engineering Education (6-credit program focused on college teaching, learning more about research on teaching and learning, and developing teaching philosophies and materials)
2016 Fall	University of New Hampshire	ENE 743 Environmental Sampling and Analysis (teaching assistant)

Presentations (2 invited, 17 at national conferences as speaker)

(speaker listed first)

Invited Talks at Conferences/Seminars

1. **Song, C.H.**, Oversimplification and Over/Under Estimation of Greenhouse Gas Emissions from the Wastewater Sector. *New Light: Rising Stars in Energy and the Environment 2024 summer seminars*, Princeton, New Jersey, July 10, 2024
2. **Song, C.H.**, Data-driven Language Model Reveals the oversimplification and Over/Under Estimation of Greenhouse Gas Emissions from the Wastewater Sector, *AAEES Workshop - WRRFs Contributions to Advance United Nationals 2030 Sustainable Development Goals, New Jersey Water Environment Association*, Atlantic City, New Jersey, May 6, 2024.

Conference Presentations

1. **Song, C.H.**, Zhu, J.J., Ren, Z. J., Toward Net-Zero: Addressing Oversimplification and Misestimation of Greenhouse Gas Emissions from the Wastewater Sector. *Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference*, May 20-22, Durham, North Carolina, 2025.
2. **Song, C.H.**, Emerging and available quantification technologies for CH₄ emissions from wastewater treatment. *2024 Residuals and Biosolids Conference*, June 18-21, Oklahoma City, Oklahoma, 2024.
3. Zondlo, M.A., Moore, D.P., Li, N.P., **Song, C.H.**, Zhu, J.J., Ren, Z. J., Robles, N.R., Hopkins, F.M., Wastewater treatment sector nitrous oxide and methane emissions from facility-integrated measurements. *AGU Fall Meeting 2023*, December 11-15, San Francisco, California, 2023.
4. Moore, D.P., Li, N.P., **Song, C.H.**, Zhu, J.J., Robles, N.R., Hopkins, F.M., Ren, Z. J., Zondlo, M.A., Multi-method approach to quantifying sector-wide gaseous emissions from US dairy and wastewater treatment. *EPA 2023 International Emissions Inventory Conference*, September 26 - 29, Seattle, Washington, 2023.
5. **Song, C.H.**, Zhu, J.J., Ren, Z. J., Systematic and quantitative analysis of nitrous oxide emissions from municipal wastewater collection and treatment systems. *Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference*, June 20-23, Boston, Massachusetts, 2023.
6. **Song, C.H.**, Zhu, J.J., Willis, J., Moore, D.P., Zondlo, M.A., Ren, Z. J., Methane emissions from municipal wastewater collection and treatment systems. *Association of Environmental Engineering*

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- & Science Professors (AEESP) Research and Education Conference, June 28-30, St. Louis, Missouri, 2022.
7. Bixler, T.S., **Song, C.H.**, Mo, W., Sustainability advantage of treating PFAS at POU vs. Centralized Treatment”. *Water Quality Association Convention and Exposition*, April 6-8, Orlando, Florida, 2022.
 8. Bixler, T.S., **Song, C.H.**, Mo, W., A Comparative Analysis of Per- and Polyfluoroalkyl Substance Treatment Options. *The 2021 Water Quality Technology Conference (WQTC)*, November 7-10, Tacoma, Washington, 2021.
 9. Diessner, N.L., **Song, C.H.**, Ashcraft, C.M., Mo, W., Acting and Modeling the Future of Dams: Science-Based Role-Play Simulations as Mechanisms for Learning and Natural Resource Planning. *The American Association of Geographers Annual Meeting*, April 7-11, Virtual, 2020.
 10. **Song, C.H.**, Mo, W., Zydlewski, J., Omalley, A., Balancing energy-fish-cost tradeoffs through strategic basin-scale dam management. *International Symposium on Sustainable Systems and Technology Conference*, June 17 virtual meeting, 2020.
 11. **Song, C.H.**, Mo, W., Balancing hydropower, fish population and biodiversity through participatory system dynamics modeling. *International Symposium on Sustainable Systems and Technology Conference*, June 25-28, Portland, Oregon, 2019.
 12. Ashcraft, C.M., Diessner, N.L., Mo, W., **Song, C.H.**, Science-based Role-play Negotiation: Integrating knowledge and boundaries across researchers and stakeholders for sustainability science. *The American Association of Geographers Annual Meeting*, April 3-7, Washington, DC, 2019.
 13. **Song, C.H.**, Mo, W., Zydlewski, J., Omalley, A., System dynamics modeling of energy and fish tradeoffs under various dam decision scenarios. *International Symposium on Sustainable Systems and Technology Conference*, June 26-28, Buffalo, New York, 2018.
 14. Ashcraft, C.M., Diessner, N.L., Mo, W., **Song, C.H.**, System Dynamics and Role-Play Simulations: Acting and Modeling to Co-Produce Knowledge. *American Association of Geographers Annual Meeting*, April 5-9, Boston, Massachusetts, 2017.
 15. **Song, C.H.** Mo, W., Understanding Life Cycle Greenhouse Gas Emissions from Dams. *Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference*, June 20-22, Ann Arbor, Michigan, 2017.
 16. Souza, S. P., Gardner, K., Mo, W., **Song, C.H.**, Smith, S., Sediments Can Represent an Alarming Source of GHG Emissions in the Decommissioning of Dams. *Society of Ecological Restoration New England Regional Conference*, October 14-15, Durham, New Hampshire, 2016.

Poster Presentations

1. **Song, C.H.**, Zhu, J.J., Ren, Z. J., How Do We Define and Achieve Net-Zero Emissions in the Wastewater Sector. *AGU24 Annual Meeting*, December 9-13, Washington D.C., 2024.
2. **Song, C.H.**, Ren, Z. J., Recalibrating global GHG emissions from the wastewater sector in national inventories. *2024 Annual Meeting of the Andlinger Center for Energy and the Environment*, October 29, Princeton, New Jersey, 2024.

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3. **Song, C.H.**, Zhu, J.J., Ren, Z. J., Data-driven language model reveals the oversimplification and over/under estimation of greenhouse gas emissions from the wastewater sector. *AGU Fall Meeting 2023*, December 11-15, San Francisco, California, 2023.
 4. **Song, C.H.**, Zhu, J.J., Ren, Z. J., Nitrous oxide emissions from municipal wastewater treatment systems. *2022 Annual Meeting of the Andlinger Center for Energy and the Environment*, October 14, Princeton, New Jersey, 2022.
 5. Bixler, T.S., **Song, C.H.**, Mo, W., A Comparative Analysis of Centralized and Point of Use Treatment of Perand Polyfluoroalkyl Substances. *Out in Science Technology Engineering and Mathematics (oSTEM) Conference 2021*, October 28-30, Virtual, 2021.
 6. **Song, C.H.**, Mo, W., Omalley, A. Roy, S.G., Zydlewski, J., Barber, B.L. Managing dams for energy, fish, and cost tradeoffs: what does a win-win solution take? *The 18th Biannual Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference*, May 14-16, Tempe, Arizona, 2019.
 7. Diessner, N.L., **Song, C.H.**, Ashcraft, C.M., Mo, W., Role-play simulations and system dynamics for sustainability solutions around dams in New England. *The 18th Biannual Association of Environmental Engineering and Science Professors (AEESP) Education & Research Conference*, May 14-16, Tempe, Arizona, 2019.
 8. **Song, C.H.**, Mo, W. System dynamics modeling of hydropower generation under various dam decision scenarios. *The 35th International Conference of the System Dynamics Society*, July 11-20, Boston, Massachusetts, 2017.
 9. **Song, C.H.**, Mo, W. System dynamics modeling of hydropower generation under various dam decision scenarios. *Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference*, June 20-22, Ann Arbor, Michigan, 2017.
 10. **Song, C.H.**, Gardner, K., Klein, S., Souza, S. P., Mo, W. Moving Beyond Hydropower: Life Cycle Greenhouse Gas Emissions from Dams. *Society for Ecological Restoration-New England Conference*, Oct 14-15, Durham, New Hampshire, 2016.
 11. **Song, C.H.**, Gardner, K., Klein, S., Souza, S. P., Mo, W. Moving Beyond Hydropower: Life Cycle Greenhouse Gas Emissions from Dams. *International Symposium on Sustainable Systems and Technology Conference*, May 16-18, Phenix, Arizona, 2016.

Workshop Organization

Sep 11, 2019	Co-organizer	Organized a dam negotiation workshop to train fisheries, biologists, engineers, and attorneys from NOAA on using the tool I developed (https://ddc.unh.edu/dam-system-dynamics/) to support decision making at a National Hydropower Program meeting (~50 participants)
Jan-May, 2019	Co-organizer	Organized 4 dam negotiation workshops to foster dialogue among diverse stakeholders on the future of dam management decisions in New Hampshire (~50 participants) and Rhode Island (~15 participants).
2018-19	Co-organizer	Organized 2 pilot participatory system dynamics simulation workshops on dam decision-making at the University of New

Hampshire (~12 participants) and the AEESP conference (~8 participants)

Peer Review (Referee for more than 17 journals)

Nature Climate Change, Environmental Science & Technology, Water Research, Scientific Data, ACS ES&T Engineering, Communications Earth & Environment, Journal of Cleaner Production, Journal of Hydrology, Energies, Frontiers in Environmental Science, Sustainability, AWWA Water Science, Ecological Restoration, Carbon management, Journal of Environmental Engineering, Landscape Management, Sustainable Environment

Academic Awards

2016	Best Student Poster at 2016 Regional Conference: <i>Society for Ecological Restoration-New England</i> , Oct 14-15, Durham, New Hampshire
2013	Awarded the Second-class Scholarship of University of Shanghai for Science and Technology for 2012-2013 academic year
2012	Awarded Outstanding Undergraduate Student of Yantai University for the class of 2012
2011	Excellent Student Scholarship of Yantai University for 2010-2011 academic years
2010	Excellent Student Scholarship of Yantai University for 2009-2010 academic years

Outreach Activities

2023	Poster Judge	<i>Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference</i>
2022	Session chair committee	<i>International Symposium on Sustainable Systems and Technology Conference</i>
2012-13	Volunteer	Education outreach in the Environmental Science Workstation

In Public Media

Princeton University, “Wastewater sector emits nearly twice as much methane as previously thought”. <https://engineering.princeton.edu/news/2023/02/28/wastewater-sector-emits-nearly-twice-much-methane-previously-thought>

Princeton University, “Many nations underestimate greenhouse emissions from wastewater systems, but the lapse is fixable”. <https://engineering.princeton.edu/news/2026/02/25/many-nations-underestimate-greenhouse-emissions-wastewater-systems-lapse-fixable>