# David J. Farnham, Ph.D.

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## Industry Experience

2025–Present **Senior Director of Data Science** ClimateAi, San Francisco, CA (remote)

- Spearhead a dynamic team of 11 data scientists, physical scientists, and ML engineers at ClimateAi, managing 6 direct reports and driving the department's strategic direction.
- Enhance product marketability and customer engagement through roles in sales meetings and customer interactions, contributing to ClimateAi's business growth.
- Develop and implement a standardized career progression framework for the data science department, fostering professional growth and clear career pathways.
- Lead the technical vision and research & development initiatives at ClimateAi, ensuring cutting-edge scientific implementations and operational excellence.
- Champion customer-centric development by dedicating several hours per week to direct customer feedback collection, influencing product development priorities.

2024–2025 **Director of Data Science** ClimateAi, San Francisco, CA (remote)

2023–2024 **Lead Innovation Scientist** ClimateAi, San Francisco, CA (remote)

2021–2023 **Senior Innovation Scientist** ClimateAi, San Francisco, CA (remote)

## Education

2018 **Ph.D., Water Resources and Climate Risk Engineering, Columbia University** Earth and Environmental Engineering Department, Advisor: Dr. Upmanu Lall.
Thesis title: *Identifying and modeling spatio-temporal patterns in high dimensional climate and weather datasets with applications to water and energy resource management*

2015 **MS, Water Resources and Climate Risk Engineering, Columbia University** Earth and Environmental Engineering Department, Advisor: Dr. Upmanu Lall.
Thesis title: *Predictive Statistical Models Linking Antecedent Meteorological Conditions and Waterway Bacterial Contamination in Urban Waterways*

2012 **B.S., Civil Engineering, SUNY-Buffalo** Summa Cum Laude, Honors College member

**B.A., Mathematics, SUNY-Buffalo** Summa Cum Laude, Honors College member

## Research Experience

2018–2021 **Postdoctoral Research Scientist** Working with Dr. Ken Caldeira at Carnegie Science Department of Global Ecology, Stanford University, Stanford, CA

2012–2018 **Graduate Student Researcher** Working with Dr. Upmanu Lall at Columbia Water Center & Department of Earth and Environmental Engineering, Columbia University, New York, NY

2012 **Student Researcher** Working with Dr. Joe Atkinson at the Department of Civil and Environmental Engineering and the Ecosystem Restoration through Interdisciplinary Exchange, NSF IGERT REU, SUNY-Buffalo, Buffalo, NY

## Teaching Experience

2015
- **Teaching Assistant & Guest Lecturer** Environmental Data Analysis (Graduate level), Department of Earth and Environmental Engineering, Columbia University, New York, NY
- **Teaching Assistant** Better Planet By Design (Undergraduate level), Department of Earth and Environmental Engineering, Columbia University, New York, NY

2014–2016
- **Lead Module Developer** HydroViz Web Modules: Teleconnections Module `https://hydroviz.org` (HydroViz is a web-based, student-centered educational system designed to support active learning in the field of hydrology)

## Select Media Appearances

### Representing Industry Employer

April 22, 2025
- **Interviewed for and quoted in NIck Ferris': "How the climate crisis will push up prices for your Easter chocolate"**The Independent, `https://www.independent.co.uk/climate-change/easter-chocolate-prices-cocoa-climate-africa-b2735242.html`

December 5, 2023
- **Appeared on Scripp's News Networks Interactive Morning rush**

### In Academic Capacity

November 5, 2021
- **Work highlighted in: "Wind and solar could power the world's major countries most of the time"**, UCI News `https://news.uci.edu/2021/11/05/wind-and-solar-could-power-the-worlds-major-countries-most-of-the-time/`

September 3, 2021
- **Interviewed for and quoted in Aarian Marshall and Matt Simon's: "21st-Century Storms Are Overwhelming 20th-Century Cities"** Wired Magazine, `https://www.wired.com/story/21st-century-storms-overwhelming-20th-century-cities`

December 12, 2018
- **Work highlighted and quoted in Ines Kagubare's: "Study tracks climate variation's impact on green power"** E&E News, `https://www.eenews.net/climatewire/2018/12/12/stories/1060109407`

December 11, 2018
- **Work highlighted and quoted in Sarah Fecht's: "How climate impacts solar and wind power supply"** Earth Institute's State of the Planet blog *and* Phys.org `https://blogs.ei.columbia.edu/2018/12/11/climate-solar-wind-power-supply/` *and* `https://phys.org/news/2018-12-climate-impacts-solar-power.html`

September 20, 2017
- **Quoted in Renee Cho's: "What the U.S. Military is Doing About Climate Change"** Earth Institute, `https://phys.org/news/2018-12-climate-impacts-solar-power.html`

April 28, 2016
- **Quoted in Mike Hower's: "Sustainable Cities Summit tackles the challenges of urban sustainability"** Planet Forward, `https://www.planetforward.org/2016/04/28/sustainable-cities-summit-tackles-the-challenges-of-urban-sustainability`

April 27, 2016
- **Quoted in Mike Hower's: "The 5 toughest challenges tomorrow's cities face"** GreenBiz, `https://www.greenbiz.com/article/5-toughest-challenges-tomorrows-cities-face`

## Miscellaneous Experience

### Select Community Involvement and Awards

2023–2024 **Meal prep, meal serving, guest greeting, and dish washer volunteer** Sunday dinner at the Trinity Outreach Center, Indianapolis, IN

2017–2018 **Event set-up, take-down, and score keeping volunteer** We Run As One Summer Youth Basketball and cultural exchange, New York, NY

2014–2018 **High school student mentor volunteer** Student Sponsor Partners, New York, NY

2014, 2016, 2017 **Facilitator at Lamont Doherty Earth Observatory open house volunteer** International Research Institute for Climate and Society, New York, NY Facilitator at Lamont Doherty Earth Observatory open house

2013–2014 **Water quality sampling site coordinator volunteer** Citizen's Water Quality Testing Program, New York, NY

### Professional Affiliations

**Member**, *American Geophysical Union* and *American Meteorological Society*.

### Select Honors and Awards

2015 **National Science Foundation/National Research Foundation of Korea EAPSI Fellowship** National Science Foundation

**Graduate Research Fellowship Program Honorable Mention** National Science Foundation

2012–2018 **Integrated Graduate Education and Research Traineeship** National Science Foundation

2012 **Best Poster Presentation** 22nd Annual Great Lakes Research Consortium

**Garmen Scholarship, Robert P. Apmann Memorial Award, and Undergraduate Research Award** SUNY-Buffalo

## Student Advisement Experience

2020–2024 **Yash Amonkar (PhD student at Columbia University)**

2017–2019 **Zeyu Xue, Jianan Cao, Bingquan Wu (master's students at Columbia University)**

2016–2017 **Caroline Schwab (high school student)**

## Journal Reviewer Experience

2017–Present **Peer reviewer** Citizen Science: Theory and Practice, Climate Research, Environmental Research Letters, Geophysical Research Letters, Hydrology and Earth System Sciences, International Journal of Geographical Information Science, Journal of Hydrology, Science of the Total Environment, Water Research, and Water Resources Research, Weather, Climate, and Society

## Conference and Seminar Organizing Experience

2018–2021 **Seminar Committee Member** Department of Global Ecology, Helped plan and run weekly seminars

2019, 2020 **Outstanding Student Paper Award Judge** American Geophysical Union Fall Meeting

2019 **Chair & Convener** NH51A/NH53B: Emerging Needs and Approaches for Climate Services: Understanding and Developing Innovative Approaches to User-Oriented Climate Services, American Geophysical Union Fall Meeting, San Francisco, CA

## Conference and Seminar Organizing Experience (continued)

- **Chair & Convener** H12B/H13J: Advances in Integrated Data Collection, Analyses, and Flood Modeling of Complex Urban Systems, American Geophysical Union Fall Meeting, San Francisco, CA

## References

Available on Request

## Publications and Presentations

### Peer-reviewed Journal Articles

1. Y. Amonkar, D. J. Farnham, and U. Lall, "A k-nearest neighbor space-time simulator with applications to large-scale wind and solar power modeling," *Patterns*, vol. 3, no. 3, p. 100 454, 2022.
2. E. G. Antonini, T. H. Ruggles, D. J. Farnham, and K. Caldeira, "The quantity-quality transition in the value of expanding wind and solar power generation," *Iscience*, vol. 25, no. 4, p. 104 140, 2022.
3. P. T. Brown, D. J. Farnham, and K. Caldeira, "Meteorology and climatology of historical weekly wind and solar power resource droughts over western north america in ERA5," vol. 3, no. 10, Sep. 2021. DOI: 10.1007/s42452-021-04794-z.
4. J. Doss-Gollin, D. J. Farnham, U. Lall, and V. Modi, "How unprecedented was the february 2021 texas cold snap?" *Environmental Research Letters*, 2021. DOI: 10.1088/1748-9326/ac0278.
5. C. L. Henry, H. Eshraghi, O. Lugovoy, *et al.*, "Promoting reproducibility and increased collaboration in electric sector capacity expansion models with community benchmarking and intercomparison efforts," *Applied Energy*, vol. 304, p. 117 745, 2021, ISSN: 0306-2619. DOI: https://doi.org/10.1016/j.apenergy.2021.117745.
6. Y. Hui, D. J. Farnham, J. F. Atkinson, Z. Zhu, and Y. Feng, "Circulation in lake ontario: Numerical and physical model analysis," *Journal of Hydraulic Engineering*, vol. 147, no. 8, p. 05 021 004, 2021. DOI: 10.1061/(ASCE)HY.1943-7900.0001908.
7. D. Tong, D. J. Farnham, L. Duan, *et al.*, "Geophysical constraints on the reliability of solar and wind power worldwide," vol. 12, no. 1, Oct. 2021. DOI: 10.1038/s41467-021-26355-z.
8. J. Doss-Gollin, D. J. Farnham, M. Ho, and U. Lall, "Adaptation over Fatalism: Leveraging High-Impact Climate Disasters to Boost Societal Resilience," *Journal of Water Resources Planning and Management*, vol. 146, no. 4, p. 01 820 001, Apr. 2020, ISSN: 0733-9496. DOI: 10.1061/(ASCE)WR.1943-5452.0001190.
9. T. H. Ruggles†, D. J. Farnham†, D. Tong, and K. Caldeira, "Developing reliable hourly electricity demand data through screening and imputation," *Scientific Data*, vol. 7, no. 1, p. 155, 2020, ISSN: 2052-4463. DOI: 10.1038/s41597-020-0483-x.
10. P. Zeng, X. Sun, and D. J. Farnham, "Skillful statistical models to predict seasonal wind speed and solar radiation in a Yangtze River estuary case study," *Scientific Reports*, vol. 10, no. 1, p. 8597, 2020, ISSN: 2045-2322. DOI: 10.1038/s41598-020-65281-w.
11. J. Doss-Gollin, D. J. Farnham, S. Steinschneider, and U. Lall, "Robust Adaptation to Multiscale Climate Variability," *Earth's Future*, vol. 7, no. 7, pp. 734–747, 2019, ISSN: 23284277. DOI: 10.1029/2019EF001154.
12. D. J. Farnham, J. Doss-Gollin, and U. Lall, "Regional Extreme Precipitation Events: Robust Inference From Credibly Simulated GCM Variables," *Water Resources Research*, vol. 54, no. 6, pp. 3809–3824, 2018, ISSN: 19447973. DOI: 10.1002/2017WR021318.

13. A. Hamidi, D. J. Farnham, and R. Khanbilvardi, "Uncertainty analysis of urban sewer system using spatial simulation of radar rainfall fields: New York City case study," *Stochastic Environmental Research and Risk Assessment*, vol. 32, no. 8, pp. 2293–2308, 2018, ISSN: 14363259. DOI: 10.1007/s00477-018-1563-8.

14. C. B. Cooper, L. R. Larson, K. K. Holland, *et al.*, "Contrasting the Views and Actions of Data Collectors and Data Consumers in a Volunteer Water Quality Monitoring Project: Implications for Project Design and Management," *Citizen Science: Theory and Practice*, vol. 2, no. 1, pp. 1–14, 2017, ISSN: 2057-4991. DOI: 10.5334/cstp.82.

15. D. J. Farnham, S. Steinschneider, and U. Lall, "Zonal Wind Indices to Reconstruct CONUS Winter Precipitation," *Geophysical Research Letters*, vol. 44, no. 24, pp. 12, 236–12, 243, Nov. 2017, ISSN: 19448007. DOI: 10.1002/2017GL075959.

16. D. J. Farnham, R. A. Gibson, D. Y. Hsueh, *et al.*, "Citizen science-based water quality monitoring: Constructing a large database to characterize the impacts of combined sewer overflow in New York City," *Science of The Total Environment*, 2016, ISSN: 00489697. DOI: 10.1016/j.scitotenv.2016.11.116.

17. D. J. Farnham and U. Lall, "Predictive statistical models linking antecedent meteorological conditions and waterway bacterial contamination in urban waterways," *Water Research*, vol. 76, pp. 143–159, 2015, ISSN: 00431354. DOI: 10.1016/j.watres.2015.02.040.

"†" indicates equal contribution

## Conference Presentations, Posters, and Non-peer-reviewed Papers

1. Y. V. Amonkar, D. J. Farnham, and U. Lall, "Joint spatio-temporal simulation of gridded hourly wind-solar fields across texas," in *AGU Fall Meeting 2021*, AGU, 2021.

2. E. Antonini, T. Ruggles, D. J. Farnham, and K. Caldeira, "Strategic site selection of wind and solar power plants in deep decarbonization scenarios for electricity systems," in *AGU Fall Meeting 2021*, AGU, 2021.

3. E. G. Antonini, T. H. Ruggles, D. J. Farnham, and K. Caldeira, "Meeting electricity demand with distributed wind and solar generation: System flexibility drives optimal siting," in *ASME International Mechanical Engineering Congress and Exposition*, American Society of Mechanical Engineers, vol. 85604, 2021, V006T06A025.

4. D. J. Farnham, L. Duan, and K. Caldeira, "Wind and solar supplied global power grid," in *AGU Fall Meeting 2021*, AGU, 2021.

5. U. Lall, Y. V. Amonkar, D. J. Farnham, V. Modi, and J. Doss-Gollin, "The risks of energy shortfalls considering temperature extremes, wind and solar energy for the texas energy grid using a novel space-time simulation model," in *AGU Fall Meeting 2021*, AGU, 2021.

6. P. T. Brown and D. J. Farnham, "Wind and Solar Droughts over western North America," in *AGU Fall Meeting*, 2020.

7. K. Caldeira, N. Lewis, K. Rinaldi, *et al.*, "A Macro Energy Modeling Framework For Transparent Investigation Of Fundamental Energy System Properties," in *AGU Fall Meeting*, 2020.

8. T. Ruggles, D. J. Farnham, C. Henry, *et al.*, "Electrofuels and curtailment of wind and solar power," in *AGU Fall Meeting*, 2020.

9. K. Caldeira, D. J. Farnham, S. J. Davis, *et al.*, "A simple energy modeling framework for transparent investigation of fundamental energy system properties," in *AGU Fall Meeting 2019*, AGU, 2019.

10. D. J. Farnham and K. Caldeira, "Availability of solar and wind energy during extreme high heat events," in *AGU Fall Meeting 2019*, AGU, 2019.

11. D. J. Farnham, K. Caldeira, S. J. Davis, *et al.*, "The macro energy model: Characterization and utility of an extremely simple energy model," in *OpenMod workshop*, NREL, 2019.

12 D. J. Farnham, S. J. Davis, N. Lewis, T. Ruggles, and K. Caldeira, "Constraining projections under deep uncertainty: The future of us electricity generation," in *AGU Fall Meeting 2019*, AGU, 2019.

13 C. Henry, J. DeCarolis, D. J. Farnham, *et al.*, "Generating a framework for inter-model comparisons in electricity dispatch modeling," in *AGU Fall Meeting 2019*, AGU, 2019.

14 K. Rinaldi, L. Duan, D. J. Farnham, T. Ruggles, K. Caldeira, and N. Lewis, "Evaluating a near-zero emissions electricity system for california with a simple energy model," in *AGU Fall Meeting 2019*, AGU, 2019.

15 T. Ruggles, K. Caldeira, L. Duan, D. J. Farnham, C. Henry, and R. Peer, "Electric grid reliability implications for a near-zero emissions energy system," in *AGU Fall Meeting 2019*, AGU, 2019.

16 D. Tong, K. Caldeira, D. J. Farnham, L. Duan, N. Lewis, and S. J. Davis, "Geophysical constraints on the reliability of solar and wind electricity systems worldwide," in *AGU Fall Meeting 2019*, AGU, 2019.

17 J. Doss-Gollin, D. J. Farnham, S. Steinschneider, and U. Lall, "Robust Adaptation to Multi-Scale Climate Variability," in *American Geophsyical Union Fall Meeting*, Washington, DC, Dec. 2018. DOI: 10.13140/RG.2.2.28447.20649.

18 D. Faranda, G. Messori, J. Doss-Gollin, D. J. Farnham, U. Lall, and P. Yiou, "Dynamics and Thermodynamics of weather extremes: a dynamical systems approach," in *European Geosciences Union General Assembly*, 2018.

19 D. J. Farnham and U. Lall, "Climate induced decadal variations in wind/solar energy generation potential and heating/cooling energy demand," in *AGU Fall Meeting*, Washington, DC, 2018.

20 J. Cao, D. J. Farnham, and U. Lall, "Spatial-temporal wind field prediction by artificial neural networks," vol. abs/1712.05293, 2017. arXiv: 1712.05293. URL: http://arxiv.org/abs/1712.05293.

21 J. Doss-Gollin, D. J. Farnham, and U. Lall, "Designing and operating infrastructure for nonstationary flood risk management," in *AGU Fall Meeting*, New Orleans, LA, 2017.

22 D. Faranda, G. Messori, J. Doss-Gollin, D. J. Farnham, U. Lall, and P. Yiou, "Dynamics and Thermodynamics of weather extremes: a dynamical systems approach," in *AGU FAll Meeting*, New Orleans, LA, 2017.

23 D. J. Farnham, J. Doss-Gollin, and U. Lall, "Regional intense precipitation: inference from credibly simulated GCM variables," in *North East Graduate Student Water Symposium*, Amherst, Mass, 2017.

24 D. J. Farnham, S. Steinschneider, and U. Lall, "Zonal wind indices to reconstruct United States winter precipitation during El Ni\
{n}o," in *AGU Fall Meeting*, New Orleans, LA, 2017.

25 E. Gawthrop, D. J. Farnham, F. Fiondella, *et al.*, "Media Analysis: Communication of the 2015/16 El Niño in Kenya," in *97th American Meterological Society Annual Meeting*, Seattle, WA, 2017.

26 J. Doss-Gollin, D. J. Farnham, and U. Lall, "Global-Local Interactions Modulate Tropical Moisture Exports to the Ohio River Basin," in *AGU Fall Meeting*, San Francisco, CA, 2016.

27 D. J. Farnham, J. Doss-Gollin, and U. Lall, "Seasonal climate signals and synoptic circulation patterns associated with regional daily intense precipitation in the Ohio River Basin," in *Workshop on Sub-Seasonal to Seasonal Predictability of Extreme Weather and Climate*, Columbia University, 2016.

28 D. J. Farnham, J. Doss-Gollin, and U. Lall, "Space-time characteristics and statistical predictability of extreme sub-weekly precipitation events in the Ohio River Basin," in *AGU Fall Meeting*, San Francisco, CA, 2016.

29 E. Habib, D. Tarboton, M. Deshotel, and D. J. Farnham, "Development of Student-centered Modules to Support Active Learning in Hydrology," in *ASEE Annual Conference & Exposition*, New Orleans, LA, 2016.

30. L. R. Larson, C. B. Cooper, K. Krafte, *et al.*, "Characterizing citizen scientists based on project engagement: Data generators, data users, and "onlooker effects."," in *Southeastern Recreation Research Conference*, Asheville, NC, 2016.

31. D. J. Farnham, U. Lall, H.-H. Kwon, and J. Doss-Gollin, "Moisture Transport and Extreme Precipitation in Mid-latitudes," in *AGU Fall Meeting*, San Francisco, CA, 2015.

32. D. J. Farnham, E. Habib, and U. Lall, "HydroViz: A Web-based Climate Teleconnection Module for Undergraduate and Graduate Water Engineering Students," in *AGU Fall Meeting*, San Francisco, CA, 2015.

33. E. Habib, M. Bodin, D. Taboton, M. Merck, and D. J. Farnham, "Stimulating Active Learning in Hydrology Using Research-Driven, Web-based Learning Modules," in *ASEE Annual Conference & Exposition*, Seattle, WA, 2015.

34. D. Y. Hsueh, D. J. Farnham, R. A. Gibson, *et al.*, "NYC URBAN WATER QUALITY: MONITORING THE FLOW OF CSOS WITH CITIZEN SCIENTISTS," in *Aquatic Sciences Meeting*, Granada, Spain, 2015.

35. D. Hsueh, D. J. Farnham, R. Gibson, *et al.*, "Advancing the Potential of Citizen Science for Urban Water Quality Monitoring: Exploring Research Design and Methodology in New York City," in *AGU Fall Meeting*, San Francisco, CA, 2015.

36. D. J. Farnham and J. F. Atkinson, "Flow visualization study: Understanding water circulation in Lake Ontario through physical modeling," in *The 22nd Annual Great Lakes Research Consortium Student-Faculty Conference*, Oswego, NY, 2012.

## Invited Presentations

1. *Climate-related risks and opportunities for 21st century energy systems*, Environmental, Water Resources, Coastal Engineering seminar series, Department of Civil, Construction, and Environmental Engineering. North Carolina State University, Virtual, 2021.

2. *Bronx Sewershed Water Quality and Citizen Science (with W. McGillis and D. Hsueh)*, Interdisciplinary Workshop on Urban Green Infrastructure: Reports on Monitoring, Modeling, Performance & Design Work. Columbia University, New York, NY, USA, 2015.

3. *Extreme Rainfall Mechanisms, Prediction, and Simulation at Chonbuk National University in Summer 2015*, NSF EAPSI closing ceremony presentation series at the National Research Foundation of Korea. Seoul, South Korea, 2015.

4. *NYC Urban Water Quality: Monitoring the Flow of CSOs with Citizen Scientists (with R. Gibson and D. Hsueh)*, Citizens Advisory Committee, New York-New Jersey Harbor & Estuary Program meeting. New York, NY, USA, 2015.

5. *Water Quality Monitoring: 2013 Citizens' Water Quality Testing Program*, New York City Department of Environmental Protect and New York City Department of Health. New York, NY, USA, 2014.

6. *Understanding Climate Risks in an Urban Environment (with M. Haraguchi)*, NSF IGERT, Solving Urbanization Challenges by Design summer workshop series. Columbia University, New York, NY, USA, 2013.

7. *Urban Water Cycle Responses to Climate*, NSF IGERT, Solving Urbanization Challenges by Design Brown Bag seminar series. Columbia University, New York, NY, USA, 2013.

## Invited Panel Participation

1. *2016 Planet Forward Sustainable Cities Summit: Rethinking Water: Solutions for a 21st Century Infrastructure*, George Washington University, Washington DC, USA, 2016.

2. *Earth Institue Sustainable Development Seminar Series: The Monster El Niño Of 2015-16: What Was Expected? And, What Was Done?* Columbia Univeristy, New York, NY, USA, 2016.