Lijing Wang

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Professional Experience

University of Connecticut

Assistant Professor, Department of Earth Sciences — 2024/08 - Present

Lawrence Berkeley National Laboratory (LBNL)

Affiliate Faculty, Climate & Ecosystem Science Division — 2024/08 - Present
Postdoctoral Fellow, Climate & Ecosystem Science Division — 2023/04 - 2024/08

Education

Stanford University

Ph.D. in Geological Sciences — 2017/09 - 2023/04
(Now Earth and Planetary Sciences)
Ph.D. minor in Computer Science — 2021/09 - 2023/04
Dissertation title: *Integrating data and models for sustainable decision-making in hydrology*
Committee: Jef Caers (Primary advisor), Kate Maher, Tapan Mukerji, Peter Kitanidis, Mykel Kochenderfer

Peking University

B.S. in Space Physics and Applied Mathematics — 2013/09 - 2017/07

Research Interests

Model-data Integration for Hydrology, ML for Uncertainty Quantification, Watershed Hydrology, Groundwater-Surface Water Interactions, Decision Making for Hydrology

Books

[1] L. Wang, Z. Yin, J. Caers, Data Science for the Geosciences, *Cambridge University Press*, 2023

Manuscripts Under Review and in Preparation

[20] L. Wang, S. Warix, R. Callahan, P. Sullivan, K. Singha, Data-model integration to unravel critical zone dynamics: challenges, successes, and future directions, *WIREs Water* (In Review)

[19] L. Wang, Z. Xu, C. Wang, R. Thibaut, C. Ulrich, M. Sprenger, Y. Wu, E. King, H. Wainwright, R. W. H. Carroll, C. Beutler, K. H. Williams, B. Dafflon, The Role of Snowmelt and Subsurface Heterogeneity in Headwater Hydrology of a Mountainous Catchment in Colorado: A Model-Data Integration Approach, *Water Resources Research* (In Review)

[18] L. Wang, T. Babey, Z. Perzan, S. Pierce, M. Briggs, K. Boye, K. Maher, Quantifying Groundwater Response and Uncertainty in Beaver-influenced Mountainous Floodplains using Machine Learning-based Model Calibration, *Water Resources Research* (In Review)

Journal Publications

[**17**] Z. Yin, A. Miltenberger, M. Topinka, **L. Wang**, T. Mukerji, J. Caers, Quantifying model misrepresentation in geophysical inversion for critical mineral exploration, *IEEE Transactions on Geoscience and Remote Sensing*, 2025

[**16**] C. Scheidt, L. Mathieu, Z. Yin, **L. Wang**, J. Caers, Masked Autoregressive Flow for Geochemical Anomaly Detection with Application to Li–Cs–Ta Pegmatites Exploration of the Superior Craton, Canada, *Natural Resources Research*, 2025

[**15**] T. Babey, Z. Perzan, S. Pierce, D.B. Rodgers, **L. Wang**, R. Carroll, J.R. Bargar, K. Boye, K. Maher, Mountainous floodplain connectivity in response to hydrological transitions, *Water Resources Research*, 2024

[**14**] T. Kurihana, I. Mastilovic, **L. Wang**, A. Meray, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Identifying climate patterns using clustering autoencoder techniques, *Artificial Intelligence for the Earth Systems*, 2024

[**13**] X. Wei, Z. Yin, C. Scheidt, K. Darnell, **L. Wang**, J. Caers, Constructing priors for geophysical inversions constrained by surface and borehole geochemistry, *Surveys in Geophysics*, 2024

[**12**] A. Ayoub, H. Wainwright, **L. Wang**, G. Sansavini, An enhanced fourier neural operator surrogate for radioactive plume transport forecasting, *Stochastic Environmental Research and Risk Assessment*, 2024.

[**11**] A. Meray*, **L. Wang***, T. Kurihana, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Physics-informed surrogate modeling for supporting climate resilience at groundwater contamination sites, *Computers & Geosciences*, 2024
* co-first authors

[**10**] **L. Wang**, L. Peeters, E.J. MacKie, Z. Yin, J. Caers, Unraveling the uncertainty of geological interfaces through data-knowledge-driven trend surface analysis, *Computers & Geosciences*, 2023

[**9**] E.J. MacKie, M. Field, **L. Wang**, Z. Yin, N. Schoedl, M. Hibbs, A. Zhang, GStatSim V1.0: a Python package for geostatistical interpolation and simulation, *Geoscientific Model Development*, 2023

[**8**] **L. Wang**, H. Kim, A. V. Christiansen, B. Hansen, T. N. Vilhelmsen, J. Caers, Statistical modeling of 3D redox architecture from non-colocated redox borehole and transient electromagnetic data, *Hydrogeology Journal (SI: Geostatistics and Hydrogeology)*, 2023

[**7**] **L. Wang**, F. Joncour, P. Barrallon, T. Harribey, L. Castanie, S. Yousfi, S. Guillon, Semi-supervised semantic segmentation for seismic interpretation, *Geophysics*, 2023

[**6**] T. Hall, C. Scheidt, **L. Wang**, Z. Yin, T. Mukerji, J. Caers, Sequential value of information for subsurface exploration drilling, *Natural Resources Research*, 2022

[5] **L. Wang**, P. Kitanidis, J. Caers, Hierarchical Bayesian inversion of global variables and large-scale spatial fields, *Water Resources Research*, 2022

[4] J. Caers, C. Scheidt, Z. Yin, **L. Wang**, T. Mukerji, K. House, Efficacy of information in mineral exploration drilling, *Natural Resources Research*, 2022

[3] A. Miltenberger, S. Uhlemann, T. Mukerji, K. Williams, B. Dafflon, **L. Wang**, H. Murakami-Wainwright, Probabilistic evaluation of geoscientific hypotheses with geophysical data: application to electrical resistivity imaging of a fractured bedrock zone, *Journal of Geophysical Research - Solid Earth*, 2021

[2] E. C. Johnston, F. Davenport, **L. Wang**, J. Caers, S. Muthukrishnan, M. Burke, N. S. Diffenbaugh, Quantifying the influence of precipitation intensity on landslide hazard in urbanized and non-urbanized areas, *Geophysical Research Letters*, 2021

[1] Q. Li, **L. Wang**, Z. Perzan, J. Caers, G. Brown, J. Bargar, K. Maher, Global sensitivity analysis of a reactive transport model for mineral scale formation during hydraulic fracturing, *Environmental Engineering Science*, 2021

Preprints

[1] A. Miltenberger, **L. Wang**, T. Mukerji, J. Caers, Formulating and solving the data-consistent geophysical inverse problem for subsurface modeling applications, EarthArXiv, 2023

Conference Publications

[2] **L. Wang**, T. Kurihana, A. Meray, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Murakami-Wainwright, Multi-scale Digital Twin: Developing a fast and physics-infused surrogate model for groundwater contamination with uncertain climate models, *Machine Learning and the Physical Sciences Workshop at the 36th conference on Neural Information Processing Systems*, 2022

[1] R. M. Rustowicz, R. Cheong, **L. Wang**, S. Ermon, M. Burke, D. Lobell, Semantic segmentation of crop type in Africa: A novel dataset and analysis of deep learning methods, *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, 2019

Research Grants

[4] National Science Foundation, Collaborative Research, Water, Landscape, and Critical Zone Processes (WaLCZ): Quantifying how groundwater modulates streamflow response to hydrologic extremes, Sara Warix (PI), **Lijing Wang** (co-PI), Laura Rademacher (co-PI), $698,947 ($172,951 to UConn)	2025 - 2028
[3] CLAS Strategic Initiative for Multidisciplinary Research, UCHI′s Human-Centered AI Team, key faculty, $2,000	2025
[2] Baseflow resilience to climate disturbances in mountainous headwater streams, NERSC AY 2025 DOE Mission Science Allocation Award	2025
[1] Developing a benchmark hydrologic dataset and a fast AI surrogate model for assessing climate impacts on mountainous hillslopes, the National Artificial Intelligence Research Resource (NAIRR) Pilot awarded projects	2024

Mentoring

Ph.D. Student:
Primary Advisor:

- Yeonju Kim, Department of Earth Sciences, University of Connecticut, 2024
- Victor Oladoja, Department of Earth Sciences, University of Connecticut, 2024
  - CUAHSI National Water Center Innovators Program Summer Institute Fellowship, 2025

Associated Advisor:

- Noah Kravette, Department of Earth Sciences, University of Connecticut, 2023
- Joshua Lee, Department of Earth Sciences, University of Connecticut, 2024

Undergraduate Student:

- Adam Argiro, Department of Earth Sciences, University of Connecticut, 2025. Current Position: Master of Applied Science, Civil Engineering at Dalhousie University.

Teaching

Introduction to Groundwater Hydrology (ERTH 4735/5735, NRE 4135)
University of Connecticut — Fall 2024, 2025

Machine Learning and Numerical Modeling in Hydrology (ERTH 4745/5720)
University of Connecticut — Spring 2026

Machine Learning in Geosciences
Guest Lecture, University of Texas at Arlington — Feb 2024

- Machine learning applications in geosciences
- Introduction to geostatistics

Data Science for Geoscience (GEOLSCI 6, GEOLSCI 240)
Teaching Assistant, Stanford University 2019 - 2022

- Taught both graduate level ($\sim$ 40 students) and undergraduate level ($\sim$ 15 students) classes
- Developed new course materials including geoscientific data case studies, python notebooks and homework
- Mentored students to apply data science tools to their own geoscientific problems
- Designed a new textbook: Data Science for the Geosciences

Honors and Awards

2025 PROSE book awards of Association of American Publishers, Earth Science Category Winner	2025
Andrei Borisovich Vistelius Research Award, International Association for Mathematical Geosciences	2024
Early Career Geoscience Faculty Workshop Travel Fund ($1,600), Saint Paul, MN	2024
Outstanding Graduate Student Award ($1,000): In recognition of exceptional scholarship and research accomplishments in the Department of Earth and Planetary Sciences, Stanford University	2023
Unexpected Discovery Innovation Award, Frontier Development Lab: Using sensitivity analysis to improve physical simulations' accuracy	2022
Stanford Data Science Scholars Program Fellowship ($100,000): Awarded to Stanford Ph.D. students who are involved in the challenging use of data science at the frontiers of their research, 11 awardees out of 151 applications	2020 - 2022
Geological Sciences Department Travel Fund	2021, 2022
Society for Industrial and Applied Mathematics (SIAM) Travel Awards	2021
Harriet Benson Fellowship Award ($5,000): honors exceptional scholarship and research accomplishments by graduate students in the Department of Geological Sciences, Stanford University	2020
2nd Prize in Stanford Big Earth Hackathon	2018
Meritorious in COMAP's Mathematical Contest in Modeling	2016
Houston BAA Scholarship	2016
Guanghua Scholarship	2014, 2015
Dean's list in School of Science, HKUST	2014

Service

Graduate and DEI Committee: UConn Earth Sciences	2025 - 2026
Primary convener/session chair: Machine Learning and Data Assimilation for Terrestrial Hydrologic Modeling and Discovery, *AGU Fall Meeting*	2022 - 2025
Editorial Board, Applied Computing and Geosciences	2025 - present
Search, Award and DEI Committee: UConn Earth Sciences	2024 - 2025
Grant Reviewer (Adhoc and Panel): National Scientific Foundation	2023 - 2025
Core Knowledge and Skills Working Group (>250 Hydrogeologists): Hydrogeologist Modeling Group 2 Lead	2024 - 2025
AGU Hydrologic Uncertainty Technical Committee	2023 - 2025
Reviewer: Water Resources Research, Advanced in Water Resources, Journal of Hydrology, Journal of Geophysical Research: Machine Learning and Computation, Hydrology and Earth System Sciences, Hydrogeology Journal, Computers & Geosciences, Mathematical Geosciences, Engineering Geology, Geophysics, Scientific Reports, Transport in Porous Media, Applied Computing and Geosciences	
Grant Reviewer (Adhoc): United States Geological Survey	2024
Grant Reviewer (Panel): NASA Water and Energy Cycle Program	2024
Convener: Diagnostics, Sensitivity, and Uncertainty Analysis of Earth and Environmental Models, *AGU Fall Meeting*	2024
Mentor (3 mentees), 2024 Data-Model Integration Meeting at Mines	2024
Guest Associate Editor, Special Issue: Advances in Geostatistical Learning, Frontiers in Applied Mathematics and Statistics	2024
Organizing committee, AI for Scientific Discovery: From Theory to Practice, *Neural Information Processing Systems Workshop (NeurIPS 2023)*	2023
Stanford Data Science Scholar Blog: Introduction to Spatial Data Analysis	2022
Student DEI leader representative, Stanford Earth	2021 - 2022
Technical mentor, Data Science for Social Good Summer Program, Stanford University	2021
Graduate panelist for Stanford Earth IDEAL (Inclusion, Diversity, Equity, and Access) faculty search	2021
Co-president in Association of Chinese Students and Scholars at Stanford	2019 - 2020
Student organizing committee, Women in Data Science (WiDS) at Stanford Earth	2019

Invited Talks

Stony Brook University | Department of Geosciences Colloquium — Apr 2025

Early Career Critical Zone Research Coordination Network Workshop — Mar 2025

Society of Exploration Geophysicists | Workshop: Improving Understanding and Treatment of Uncertainty in Groundwater Science and Management — Feb 2025

University of Connecticut | Global Environmental Remote Sensing Laboratory, Department of Natural Resources and the Environment — Oct 2024

University of Arizona | Department of Hydrology and Atmospheric Sciences Seminar — Apr 2023

SLAC National Accelerator Laboratory | Environmental Geochemistry Group Research Talk — Mar 2023

University of Connecticut | Department of Earth Sciences Seminar — Feb 2023

University of Florida | Department of Geological Sciences Seminar — Jan 2023

Presentation and Poster

* Graduate Student

[34] L. Wang, Z. Xu, C. Wang, R. Thibaut, C. Ulrich, M. Sprenger, Y. Wu, E. King, H. Wainwright, R. W. H. Carroll, C. Beutler, K. H. Williams, B. Dafflon, The Role of Snowmelt and Subsurface Heterogeneity in Headwater Hydrology of a Mountainous Catchment in Colorado: A Model-Data Integration Approach, *Gordon Research Conference, Catchment Science: Interactions of Hydrology, Biology and Geochemistry* [Poster]

[33] V. Oladoja*, **L. Wang**, Using Temporal Graph Neural Networks to Enhance Understanding of Subsurface Properties' Controls on Headwater Streams, *NAIRR Pilot Annual Meeting 2025* [Poster]

[32] M. Field, E. Mackie, A. Muto, **L. Wang**, N.Shao, Probabilistic Gravity Inversion of Sub-ice-shelf Bathymetry in West Antarctica for Improved Uncertainty Quantification, *American Geophysical Union, Fall Meeting 2024* [Poster]

[31] E. King, H. Wainwright, M. Newcomer, **L. Wang**, N. Falco, E. Brodie, From Bedrock to Canopy: Investigating Impacts of Trait Co-variability on Hydrologic-Biogeochemical Processes Across Two Contrasting Rocky Mountain Watersheds, *American Geophysical Union, Fall Meeting 2024* [Poster]

[30] L. Wang, T. Babey, Z. Perzan, S. Pierce, K. Boye, K. Maher, The Influence of Floodplain Architecture on Groundwater Responses to Beaver-Induced Inundation, *American Geophysical Union, Fall Meeting 2024* [Oral]

[29] L. Wang, Z. Xu, C. Wang, R. Thibaut, C. Ulrich, M. Sprenger, S. Uhlemann, Y. Wu, E. King, H. Wainwright, B. Dafflon, Quantifying the Impacts of Snow Dynamics

and Subsurface Structure on Hydrology in Mountainous Hillslopes Through Field and Modeling Investigations, *American Geophysical Union, Fall Meeting 2024* [Poster]

[28] L. Wang, T. Babey, Z. Perzan, S. Pierce, K. Boye, K. Maher, the Influence of Floodplain Structure on Local and Regional Hydrologic Responses to Beaver-Induced Inundation, *ModFlow and More 24* [Oral]

[27] L. Wang, Z. Xu, C. Wang, R. Thibaut, C. Ulrich, M. Sprenger, S. Uhlemann, Y. Wu, E. King, H. Wainwright, B. Dafflon, Identifying Representative Traits in Mountainous Hillslopes through Hydrologic Modeling and Data Integration, *ModFlow and More 24* [Oral]

[26] L. Stolze*, **L. Wang***, Z. Xu, B. Dafflon, B. Arora, D. Dwivedi, C. Steefel, R. Thibaut, M. Sprenger, S. Uhlemann, C. Wang, Y. Wu, H. Wainwright, K. Boye, N. Falco, C. Ulrich, W. Dong, M. Bill, C. Beutler, B. Gilbert, K. Williams, M. Newcomer, Model-based interpretation of hydrological and biogeochemical functional traits of hillslopes in a mountainous watershed, *Principal Investigators Meeting of the Department of Energy's Environmental System Science (ESS) Program, 2024 (ESS PI Meeting)* [Poster]

[25] L. Wang, T. Babey, Z. Perzan, S. Pierce, K. Boye, K. Maher, Modeling the impact of engineered ponding on floodplain hydrologic flow paths and solute transport, *Principal Investigators Meeting of the Department of Energy's Environmental System Science (ESS) Program, 2024 (ESS PI Meeting)* [Poster]

[24] L. Wang, Z. Xu, R. Thibaut, C. Wang, M. Sprenger, S. Uhlemann, E. Smith, C. Ulrich, Y. Wu, H. Wainwright, K. Williams, B. Dafflon, Towards scaling up watershed modeling: Identifying representative traits in mountainous hillslopes through hydrologic modeling and data integration, *American Geophysical Union, Fall Meeting 2023* [Poster]

[23] K. Maher, T. Babey, **L. Wang**, K. Boye, Scaling water and nutrient exchanges across floodplain interfaces in headwater catchments, *American Geophysical Union, Fall Meeting 2023* [Oral]

[22] E.J. MacKie, M. Field, N. Schoedl, **L. Wang**, Z. Yin, A. Zhang, M. Gravey, GStatSim: a FAIR geostatistics software package in Python, *American Geophysical Union, Fall Meeting 2023* [Oral]

[21] S. Praveen, Z. Xu, H. Wainwright, **L. Wang**, A. Meray, Tackling Environmental Challenges with 3D Surrogate Models: Groundwater Contamination Prediction, *American Geophysical Union, Fall Meeting 2023* [Poster]

[20] X. Wei, Z. Yin, C. Scheidt, K. Darnell, **L. Wang**, J. Caers, Quantifying uncertainty for sediment-hosted mineral deposits using multiple geoscientific observations and Bayesian evidential learning, *American Geophysical Union, Fall Meeting 2023* [Poster]

[19] **L. Wang**, T. Kurihana, A. Meray, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Physics-informed surrogate modeling for supporting climate resilience at groundwater contamination sites, Technical Session: Artificial Intelligence/Machine Learning-Empowered Digitization of Environmental Systems, *RemPlex 2023 Global Summit* [Oral]

[18] **L. Wang**, T. Kurihana, A. Meray, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Physics-informed surrogate modeling for supporting climate resilience at groundwater contamination sites, *HydroML 2023 symposium* [Plenary eLightning Talk]

[17] **L. Wang**, C. Scheidt, Z. Yin, K. Maher, J. Caers, Parameter inversion with sequential neural density estimators: an enhanced machine learning-based inversion, *American Geophysical Union, Fall Meeting 2022* [Poster]

[16] **L. Wang**, T. Kurihana, A. Meray, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Physics-informed surrogate modeling for supporting climate resilience at groundwater contamination sites, *American Geophysical Union, Fall Meeting 2022* [Poster]

[15] E.J. MacKie, **L. Wang**, Z. Yin, A. Zhang, N. Schoedl, GlacierStats geostatistical software for modeling ice sheet conditions, *American Geophysical Union, Fall Meeting 2022* [Poster]

[14] Q. Li, K. Maher, **L. Wang**, J. Caers, A shale-water interaction model and its sensitivity to each input parameter over the entire domain, *American Geophysical Union, Fall Meeting 2022* [Oral]

[13] **L. Wang**, T. Kurihana, A. Meray, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Multi-scale Digital Twin: Developing a fast and physics-infused surrogate model for groundwater contamination with uncertain climate models, *Machine Learning and the Physical Sciences Workshop at the 36th conference on Neural Information Processing Systems* [Poster]

[12] **L. Wang**, T. Kurihana, A. Meray, I. Mastilovic, S. Praveen, Z. Xu, M. Memarzadeh, A. Lavin, H. Wainwright, Physics-informed surrogate modeling for supporting climate resilience at groundwater contamination sites, *Frontier Development Lab 2022 Live Showcase* [Oral]

[11] **L. Wang**, Z. Perzan, T. Babey, M. Briggs, S. Pierce, B. Rogers, J. Bargar, K. Maher, Uncertainty quantification of water exchanges due to beaver-induced inundation, *American Geophysical Union, Fall Meeting 2021* [Oral]

[10] E.J. MacKie, **L. Wang**, D.M. Schroeder, C. Zuo, Z. Yin, J. Caers, M. Hibbs, The parallel worlds of DEMOGORGN Greenland, *American Geophysical Union, Fall Meeting 2021* [Oral]

[9] T. Babey, Z. Perzan, B. Rogers, **L. Wang**, S. Pierce, J. Bargar, K. Maher,

Hydro-biogeochemical response of oxic-anoxic interfaces to beaver dam construction in a simulated floodplain aquifer, *American Geophysical Union, Fall Meeting 2021* [Poster]

[8] L. Wang, L. Peeters, J. Caers, Quantifying uncertainty of non-stationary geological interfaces: Metropolis-Hasting sampling of implicit level sets, *SIAM Conference on Mathematical & Computational Issues in the Geosciences, 2021* [Oral]

[7] L. Wang, T. N. Vilhelmsen, J. Caers, Local decision making through understanding of multi-scale uncertainty: Application to well catchment protections in Denmark *Computational Methods in Water Resources, 2020* [Oral]

[6] L. Wang, L. Peeters, J. Caers, Uncertainty assessment of hydrogeological structures combining geophysical survey and geological knowledge: A stochastic level set optimization framework, *American Geophysical Union, Fall Meeting 2020* [Oral]

[5] L. Wang, T. N. Vilhelmsen, J. Caers, Direct forecasting of local hydraulic conductivity using combined geophysical and hydrological data: Application to well catchment predictions in Danish aquifer system, *American Geophysical Union, Fall Meeting 2019* [Poster]

[4] L. Wang, T. N. Vilhelmsen, J. Caers, Joint Uncertainty Quantification on Spatial and Global Hydrogeological Models: An Application to Danish Groundwater Management, *American Geophysical Union, Fall Meeting 2018* [Poster]

[3] E. C. Johnston, J. Caers, **L. Wang**, F. Davenport, S. Muthukrishnan, N. S. Diffenbaugh, Multi-scale signatures of climate change on landslide susceptibility: a case study for the Pacific Coast of the United States, *American Geophysical Union, Fall Meeting 2018* [Poster]

[2] L. Wang, O. Grujic, J. Caers, Reconstruction and Forecasting Oil Rates Using Functional Data Analysis and Universal Co-Kriging, *NGI Industrial Affiliates Meeting, Stanford University, 2017* [Poster]

[1] L. Wang, O. Grujic, J. Caers, Statistical Learning on Incomplete Production Profiles of Unconventional Reservoirs, *NGI Industrial Affiliates Meeting, Stanford University, 2016* [Poster]