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James Doss-Gollin

James Doss-Gollin

APPOINTMENTS

Rice University
Assistant Professor, Department of Civil & Environmental Engineering 2021–
The Pennsylvania State University
Postdoctoral Scholar, Earth & Environmental Systems Institute 2020

EDUCATION

Columbia University
Ph.D in Earth & Environmental Engineering. 2020
M.S. in Earth & Environmental Engineering. 2016
Yale University
B.S. in Mechanical Engineering. 2015

AWARDS

Outstanding Reviewer Award, Earth's Future. 2023
Nickolas and Liliana Themelis Fellowship, Fu Foundation School of Engineering and Applied Science, Columbia University. 2018
Graduate Research Fellowship, Climate and Large-Scale Atmospheric Dynamics, National Science Foundation. 2017
Presidential Distinguished Fellowship, Fu Foundation School of Engineering and Applied Science, Columbia University. 2015
Distinction in Major, Department of Mechanical Engineering and Materials Science, Yale University. 2015
Legacy Award, New Haven Promise. 2015
Larry Coben '79 Fellowship, Yale University. 2014
Vance-Carter Travel Award, Yale University. 2013
Thomas C. Barry Travel Award, Yale University. 2012

GRANTS AND CONTRACTS

Amounts reflect Rice portion for collaborative grants and subawards; total amount for direct awards.

National Science Foundation: Confronting Hazards, Impacts and Risks for a Resilient Planet (CHIRRP). "RAISE: Flood resilience in rural Texas communities." **co-PI** (PI: Avantika Gori). **$999,986**. 2025–2028
Consortium for Enhancing Resilience and Catastrophe Modeling (CERCAT). "A Nonstationary Joint Probability Method for Tropical Cyclone Hazard Assessment." **Lead PI**. **$75,000**. 2025–2026
NVIDIA. "Computing Infrastructure for AI-enhanced Climate Risk and Resilience at Rice." **co-PI** (PI: Arlei Lopes da Silva). **$0**. 2025–2025
Ken Kennedy Institute at Rice University. "Advancing AI for Climate Risk and Urban Resilience." **Lead PI**. **$160,000**. 2024–2025
National Science Foundation. "IUCRC Planning Grant Rice University: Center for Climate, Equity and Resilience in Catmodeling (CERCat)." **co-PI** (PI: Jamie Padgett). **$20,000**. 2024–2025
Texas Water Development Board (via Texas A&M University). "Developing Future Rainfall Frequency Grids for the State of Texas." **Subaward PI**. **$77,750**. 2022–2025
National Science Foundation: Strengthening America's Infrastructure. "EAGER: Participatory Design for Water Quality Monitoring of Highly Decentralized Water Infrastructure Systems." **PI** (PI: Alicia Cooperman). **$104,684**. 2022–2025

National Science Foundation: Climate and Large-Scale Dynamics. "Collaborative Research: Evaluating the Past and Future of Mississippi River Hydroclimatology to Constrain Risk via Integrated Climate Modeling, Observations, and Reconstructions." **co-PI**. **$472,024**. 2022–2025

Rice University: Sustainable Futures Fund. "Leveraging Earth System Observations at Multiple Scales to Improve Stormwater Management in Houston." **Lead PI**. **$50,000**. 2022–2023

100,000 Strong in the Americas Innovation Fund. "IFCE-Rice-SENAI Program on Artificial Intelligence for Urban Sustainability and Resilience to Natural Disasters in the Americas." **co-PI** (PI: Arlei Lopes da Silva). **$50,000**. 2022–2023

Energy Foundation. "Synthesis of Texas Electricity Research from Rice University." **co-PI** (PI: Daniel Cohan). **$24,928**. 2022–2023

JOURNAL ARTICLES

† **denotes Rice advisee publication.** Google Scholar 🎓 *citations*: 568, *h-index*: 11, *i10-index*: 13.

IN PREP. / UNDER REVIEW

Baer, J., Sebastian, A., Grimley, L. E., **Doss-Gollin, J.**, Wright, D. B., and Hussain, M. A. *Neglecting Spatiotemporal Rainfall Variability Underestimates Flood Hazard and Risk*.

Hancock, C. L., Dee, S. G., Haider, M. R., **Doss-Gollin, J.**, Lehner, F., Murphy, K., and Munoz, S. E. *Robust 21st Century Hydrological Trends in the Mississippi River Basin from CMIP6: West-Gets-Drier, East-Gets-Wetter*.

O'Donnell, M., Murphy, K., **Doss-Gollin, J.**, Dee, S., and Munoz, S. *Evaluation of Hydroclimatic Biases in the Community Earth System Model (CESM1) within the Mississippi River Basin*. DOI: 10.5194/hess-2024-153.

Pollack, A., Auermuller, L., Burleyson, C., Campbell, J. E., Condon, M., Cooper, C., Coronese, M., Dangendorf, S., **Doss-Gollin, J.**, Hegde, P., Helgeson, C., Kopp, R., Kwakkel, J., Leaf, A., Lesk, C., Mankin, J., Nicholas, R. E., Rice, J. S., Roth, S., Scheeler, M., Srikrishnan, V., Tuana, N., Vernon, C., Zhao, M., and Keller, K. *Unlocking the Benefits of Transparent and Reusable Science for Climate-Risk Management*. DOI: 10.31219/osf.io/29nhv.

Pollack, A., **Doss-Gollin, J.**, Srikrishnan, V., and Keller, K. *UNSAFE: An UNcertain Structure And Fragility Ensemble Framework for Property-Level Flood Risk Estimation*. DOI: 10.31219/osf.io/jb9ta.

PUBLISHED

Haider, M. R., Dee, S. G., **Doss-Gollin, J.**, Dunne, K. B. J., and Muñoz, S. E. **2025**. "Impact of 21st Century Climate Change on Mississippi River Basin Discharge in CESM2 Large Ensemble Projections". *Global and Planetary Change*, DOI: 10.1016/j.gloplacha.2025.104742.

Liu, C., Kowal, D. R., **Doss-Gollin, J.**, and Vannucci, M. **2025**. "Bayesian Functional Graphical Models with Change-Point Detection". *Computational Statistics & Data Analysis*, DOI: 10.1016/j.csda.2024.108122.

Liu, Y., **Doss-Gollin, J.**, Dai, Q., Veeraraghavan, A., and Balakrishnan, G. **2025**. "Downscaling Extreme Precipitation with Wasserstein Regularized Diffusion". *IEEE Transactions on Geoscience and Remote Sensing*, DOI: 10.1109/TGRS.2025.3611872.

Lu, Y.†, Seiyon Lee, B., and **Doss-Gollin, J. 2025**. "Bayesian Spatiotemporal Nonstationary Model Quantifies Robust Increases in Daily Extreme Rainfall across the Western Gulf Coast". *Environmental Research: Climate*, DOI: 10.1088/2752-5295/adf56e.

Kazadi, A., **Doss-Gollin, J.**, Sebastian, A., and Silva, A. **2024**. "FloodGNN-GRU: A Spatio-Temporal Graph Neural Network for Flood Prediction". *Environmental Data Science*, DOI: 10.1017/eds.2024.19.

Murphy, K., Dee, S., **Doss-Gollin, J.**, Dunne, K. B. J., O'Donnell, M., and Muñoz, S. **2024**. "Competing Influences of Land Use and Greenhouse Gas Emissions on Mississippi River Basin Hydroclimate Simulated Over the Last Millennium". *Paleoceanography and Paleoclimatology*, DOI: 10.1029/2024PA004902.

Singh, D., Bekris, Y. S., Rogers, C. D. W., **Doss-Gollin, J.**, Coffel, E. D., and Kalashnikov, D. A. **2024**. "Enhanced Solar and Wind Potential during Widespread Temperature Extremes across the U.S. Interconnected Energy Grids". *Environmental Research Letters*, DOI: 10.1088/1748-9326/ad2e72.

Amonkar, Y., **Doss-Gollin, J.**, Farnham, D. J., Modi, V., and Lall, U. **2023**. "Differential Effects of Climate Change on Average and Peak Demand for Heating and Cooling across the Contiguous USA". *Communications Earth & Environment*, DOI: 10.1038/s43247-023-01048-1.

Amonkar, Y., **Doss-Gollin, J.**, and Lall, U. **2023**. "Compound Climate Risk: Diagnosing Clustered Regional Flooding at Inter-Annual and Longer Time Scales". *Hydrology*, DOI: 10.3390/hydrology10030067.

Doss-Gollin, J., Amonkar, Y., Schmeltzer, K., and Cohan, D. **2023**. "Improving the Representation of Climate Risks in Long-Term Electricity Systems Planning: A Critical Review". *Current Sustainable/Renewable Energy Reports*. DOI: 10.1007/s40518-023-00224-3.

Doss-Gollin, J. and Keller, K. **2023**. "A Subjective Bayesian Framework for Synthesizing Deep Uncertainties in Climate Risk Management". *Earth's Future*. DOI: 10.1029/2022EF003044.

Garcia, M., Juan, A., **Doss-Gollin, J.**, and Bedient, P. **2023**. "Leveraging Mesh Modularization to Lower the Computational Cost of Localized Updates to Regional 2D Hydrodynamic Model Outputs". *Engineering Applications of Computational Fluid Mechanics*, DOI: 10.1080/19942060.2023.2225584.

Wutich, A., Thomson, P., Jepson, W., Stoler, J., Cooperman, A. D., **Doss-Gollin, J.**, Jantrania, A., Mayer, A., Nelson-Nuñez, J., Walker, W. S., and Westerhoff, P. **2023**. "MAD Water: Integrating Modular, Adaptive, and Decentralized Approaches for Water Security in the Climate Change Era". *WIREs Water*, DOI: 10.1002/wat2.1680.

Zhou, X., Duenas-Osorio, L., **Doss-Gollin, J.**, Liu, L., Stadler, L., and Li, Q. **2023**. "Mesoscale Modeling of Distributed Water Systems Enables Policy Search". *Water Resources Research*. DOI: 10.1029/2022WR033758.

Doss-Gollin, J., Farnham, D. J., Lall, U., and Modi, V. **2021**. "How Unprecedented Was the February 2021 Texas Cold Snap?" *Environmental Research Letters*. DOI: 10.1088/1748-9326/ac0278.

Doss-Gollin, J., Farnham, D. J., Ho, M., and Lall, U. **2020**. "Adaptation over Fatalism: Leveraging High-Impact Climate Disasters to Boost Societal Resilience". *Journal of Water Resources Planning and Management*. DOI: 10.1061/(asce)wr.1943-5452.0001190.

Doss-Gollin, J., Farnham, D. J., Steinschneider, S., and Lall, U. **2019**. "Robust Adaptation to Multiscale Climate Variability". *Earth's Future*, DOI: 10.1029/2019ef001154.

Rözer, V., Kreibich, H., Schröter, K., Müller, M., Sairam, N., **Doss-Gollin, J.**, Lall, U., and Merz, B. **2019**. "Probabilistic Models Significantly Reduce Uncertainty in Hurricane Harvey Pluvial Flood Loss Estimates". *Earth's Future*. DOI: 10.1029/2018ef001074.

Doss-Gollin, J., Muñoz, Á. G., Mason, S. J., and Pastén, M. **2018**. "Heavy Rainfall in Paraguay during the 2015-2016 Austral Summer: Causes and Sub-Seasonal-to-Seasonal Predictive Skill". *Journal of Climate*, DOI: 10.1175/jcli-d-17-0805.1.

Farnham, D. J., **Doss-Gollin, J.**, and Lall, U. **2018**. "Regional Extreme Precipitation Events: Robust Inference from Credibly Simulated GCM Variables". *Water Resources Research*. DOI: 10.1002/2017wr021318.

Doss-Gollin, J., de Souza Filho, F. d. A., and da Silva, F. O. E. **2015**. "Analytic Modeling of Rainwater Harvesting in the Brazilian Semiarid Northeast". *Journal of the American Water Resources Association*, DOI: 10.1111/1752-1688.12376.

PEER-REVIEWED CONFERENCE PROCEEDINGS

Kazadi, A., **Doss-Gollin, J.**, and Silva, A. **2024**. "Pluvial Flood Emulation with Hydraulics-Informed Message Passing". *Forty-First International Conference on Machine Learning*.

Kazadi, A. N., **Doss-Gollin, J.**, Sebastian, A., and Silva, A. **2022**. "Flood Prediction with Graph Neural Networks". *Climate Change AI*. NeurIPS 2022 Workshop on Tackling Climate Change with Machine Learning. Climate Change AI.

Araújo Júnior, L. M., de Souza Filho, F. d. A., da Silva Silveira, C., Aragão Dias, T., and **Doss-Gollin, J. 2014**. "Análise dos eventos de seca no Nordeste Setentrional Brasileiro com base no índice de precipitação normalizada". *XII Simpósio de Recursos Hídricos Do Nordeste*. Natal, Rio Grande do Norte, Brasil: Associação Brasileira de Recursos Hídricos (ABRH). DOI: 10.13140/rg.2.1.4610.7685.

Doss-Gollin, J., de Souza Filho, F. d. A., and da Silva, F. O. E. **2014**. "Considerações sobre a sustentabilidade hídrica de cisternas para captação de chuva no Semiárido Brasileiro". *XII Simpósio de Recursos Hídricos Do Nordeste*. Natal, Rio Grande do Norte, Brasil: Associação Brasileira de Recursos Hídricos (ABRH). DOI: 10.13140/rg.2.1.4086.4807.

INVITED TALKS

"Advancing Urban Flood Risk Management through Physics-informed, Data-Driven Hazard Assessment". Earth, Marine, and Environmental Science Seminar, **University of North Carolina**, Chapel Hill, NC. 2024

"Quantifying and characterizing uncertain climate hazards to enable adaptive resilience". Atmospheric Sciences Seminar, **Texas A&M University**, College Station, TX. 2022

"Unprecedented impacts don't require unprecedented weather". Post-Harvey Climate & Flood Impacts on the Built Environment, **Severe Storm Prediction, Education, & Evacuation from Disasters Center**, Houston, TX. 2022

"Revisiting our design criteria: What hazards should we design for in a changing climate?". Hydrologic Sciences and Water Resources Engineering Seminar, **University of Colorado Boulder**, Remote Presentation. 2022

"Adapting Engineering Design Criteria to a Changing Climate: Insights from House Elevation ". Technical Webinar, **ASCE Central New Jersey Branch**, Remote Presentation. 2022

"Panelist". Extreme Weather: How To Report on a World That's Warmer, Colder, Wetter, Drier and Weirder, **31st Annual Conference of the Society of Environmental Journalists**, Houston, TX. 2022

"Extreme Impacts Don't Require Extreme Weather: Lessons from the February 2021 Texas Blackouts". Outreach Event: Science is for Everyone, **American Meteorlogical Society**, Remote Presentation. 2022

"Extreme Impacts Don't Require Extreme Weather: Lessons from the February 2021 Texas Blackouts". Compound Events Working Group, **Risk KAN (Knowledge Action Networks)**, Remote Presentation. 2021

"Panelist". Tail events: Prediction, Planning, and Performance, **Harvard Electricity Policy Group**, Remote Presentation. 2021

"Towards Adaptive Resilience: Managing Flood Risks in a Changing World". Technical Webinar, **ASCE Central New Jersey Branch**, Remote Presentation. 2021

"Prediction and Implications of Structured Climate Risk for Sequential Adaptation under Deep Uncertainty". Center for Climate Risk Management CLIMA Seminar, **the Pennsylvania State University**, State College, PA. 2020

"Prediction and Implications of Structured Climate Risk for Sequential Adaptation under Deep Uncertainty". Department of Civil and Environmental Engineering Seminar, **Rice University**, Houston, TX. 2020

"Prediction and Implications of Structured Climate Risk for Sequential Adaptation under Deep Uncertainty". Complex Systems Simulation and Optimization Group, **National Renewable Energy Laboratory**, Golden, CO. 2020

"Drivers of Extreme Rainfall: Atmospheric Circulation Patterns and Regional Intense Rainfall in the Ohio River". European Flood Awareness System Group, **European Centre for Medium Range Weather Forecasting**, Reading, England. 2016

"Understanding the Physical Drivers of Extreme Rainfall for Flood Prediction". Oxford Water Network, **Oxford University**, Oxford, England. 2016

WORKSHOP PRESENTATIONS

Presenter names in blue indicate advisee presentations.

"Robust Trends in Extreme Rainfall Probabilities in Texas". **2025 Texas Climate Conference**, *Rice University and Texas A&M University*, Houston, TX [*Talk*]. 2025

"Use-inspired tools for climate hazard assessment". **Nature-Based Solutions for a Resilient Gulf Coast Workshop**, *Rice University*, Houston, TX [*Talk*]. 2025

"Advancing Urban Flood Hazard Characterization through Machine Learning: Challenges and Opportunities". **American Geophysical Union Fall Meeting 2024**, *AGU*, Washington, DC [*Talk*]. 2024

Yuchen Lu: "TxRAIN-Observational: A Hierarchical Bayesian Spatial Framework to Assess Nonstationary Rainfall Intensity, Frequency, and Duration in Texas". **American Geophysical Union Fall Meeting 2024**, *AGU*, Washington, DC [*Talk*]. 2024

"Assessing and Managing Climate Risks to Electricity Systems in an Era of Climate Change and Energy Transition". **American Geophysical Union Fall Meeting 2024**, *AGU*, Washington, DC [*Talk*]. 2024

Yuchen Lu: "Nonstationary Extreme Precipitation Probabilities in Texas". **Fall Meeting**, *Consortium for Enhancing Resilience and Catastrophe Modeling (CERCat)*, Bethlehem, PA [*Poster*]. 2024

"Leveraging Machine Learning to Advance Urban Flood Hazard Assessment: Challenges and Opportunities". **Data-driven and physics-based machine learning methods for forecasting and knowledge discovery of surface hydrology**, *Conference on Computational Methods in Water Resources*, Tucson, AZ [*Talk*]. 2024

Yuchen Lu: "Spatially Varying and Duration Dependent Covariate Model: A Hierarchical Bayesian Framework for Multi-duration Extreme Precipitation Frequency Analysis in Texas". **World Environmental & Water Resources Congress 2024**, *Environmental & Water Resources Institute (EWRI) - ASCE*, Milwaukee, WI [*Talk*]. 2024

Yuchen Lu: "H21T-1602: Spatially Varying Covariate Model: A Hierarchical Bayesian Framework for Precipitation Frequency Analysis in the Gulf Coast". **American Geophysical Union Fall Meeting 2023**, *AGU*, San Francisco, CA [*Talk*]. 2023

"NH14B-07: Linking Robust Trends in Observations and Models to Develop Nonstationary Rainfall Frequency Grids for the State of Texas". **American Geophysical Union Fall Meeting 2023**, *AGU*, San Francisco, CA [*Talk*]. 2023

"A Bayesian Spatial Hierarchical Framework for Process-Informed Nonstationary Analysis of Precipitation Frequencies". **13th International Workshop on Statistical Hydrology**, *International Association of Hydrological Sciences*, Boston, MA [*Talk*]. 2023

Yuchen Lu: "H42E-1333: Nonstationary GEV with Hierarchical Spatial Pooling: A Spatiotemporal Bayesian Framework for Nonstationary Extreme Precipitation Frequency Analysis in the Gulf Coast". **American Geophysical Union Fall Meeting 2022**, *AGU*, Chicago, IL [*Talk*]. 2022

"H35F-07: Near-term Predictability Lowers Long-Term Adaptation Costs". **American Geophysical Union Fall Meeting 2022**, *AGU*, Chicago, IL [*Talk*]. 2022

"H25U-1265: Operationalizing Bayesian Model Checking for Robust Decision Making: Insights from House Elevation". **American Geophysical Union Fall Meeting 2021**, *AGU*, New Orleans, LA [*Poster*]. 2021

"A14H-03: How Unprecedented Was the February 2021 Texas Cold Snap?". **American Geophysical Union Fall Meeting 2021**, *AGU*, New Orleans, LA [*Talk*]. 2021

"Valuing Flexibility and Soft Instruments for Sequential Decision Problems". **2020 Annual Meeting**, *Society for Decision Making under Deep Uncertainty*, [*Remote Presentation*]. 2020

"H11G-07: Towards Adaptive Resilience: Managing Uncertainties and Exploiting Predictability across Timescales". **American Geophysical Union Fall Meeting 2019**, *AGU*, San Francisco, CA [*Talk*]. 2019

"Adaptive Resilience through Real Options and Deep Reinforecement Learning". **Doctoral Consortium on Computational Sustainability**, *Carnegie Mellon University*, Pittsburgh, PA [*Talk*]. 2019

"Evaluating Staged Investments in Critical Infrastructure for Climate Adaptation". **2019 Interdisciplinary Ph.D. Workshop in Sustainable Development**, *Columbia University*, New York, NY [*Talk*]. 2019

"H52F-05: Robust Adaptation to Cyclical Climate Risk". **American Geophysical Union Fall Meeting 2018**, *AGU*, Washington, DC [*Talk*]. 2018

"Robust Adaptation to Multi-Scale Climate Variability". **The Nexus of Climate Data, Insurance, and Adaptive Capacity**, Asheville, NC [*Poster*]. 2018

"A31H-0135: Causes and Model Skill of the Persistent Intense Rainfall and Flooding in Paraguay during the Austral Summer 2015-2016". **American Geophysical Union Fall Meeting 2017**, *AGU*, New Orleans, LA [*Talk*]. 2017

"H22B-02: Designing and Operating Infrastructure for Nonstationary Flood Risk Management". **American Geophysical Union Fall Meeting 2017**, *AGU*, New Orleans, LA [*Talk*]. 2017

"Extreme Rainfall in Paraguay during the 2015-16 Austral Summer: Causes and Predictive Skill". **North East Graduate Student Water Symposium**, *University of Massachusetts Amherst*, Amherst, MA [*Talk*]. 2017

"Regional Intense Precipitation: Inferences From GCM Atmospheric Circulation Fields". **Modeling Research in the Cloud**, *National Center for Atmospheric Research*, Boulder, CO [*Poster*]. 2017

"Statistical-Dynamical Analysis of Climate Projections for Flood Infrastructure Design". **Interdisciplinary Ph.D. Workshop in Sustainable Development 2017**, *Columbia University*, New York, NY [*Talk*]. 2017

"Causes and Model Skill of the Persistent Intense Rainfall and Flooding in Paraguay during the Austral Summer 2015-2016". **Workshop on Subseasonal to Seasonal Predictability of Extreme Weather and Climate**, *Columbia University*, New York, NY [*Poster*]. 2016

MEDIA HIGHLIGHTS

"Historic Texas Flooding." **KEYE-AUS (CBS)** [*recorded video interview*]. 2025

"Houston's Morning Show." **Fox26 Houston** [*live video interview*]. 2025

"Breaking down the force of water in the Texas floods." **AP News** — Michael Phillis [*print*]. 2025

"Here are some things you can do to be better prepared for major flooding." **Associated Press** — Caleigh Wells [*print*]. 2025

"ABC13-Luke Jones speaks with James Doss-Gollin, an assistant professor of Civil and Environmental Engineering at Rice University, about the key differences between flooding in Houston and central Texas.." **ABC13** — Luke Jones [*recorded video interview*]. 2025

"After deadly flooding in Central Texas, state lawmakers look to prevent similar tragedies." **KVUE** — Daniel Perreault [*recorded video interview*]. 2025

"New Flood Warning System Greenlit Shortly Before Deadly Texas Disaster." **The Wall Street Journal** — Joseph De Avila [*print*]. 2025

"Questions arise on how emergency warning systems work after Central Texas flood." **ABC13** — Tom Abrahams [*print*]. 2025

"Bajo la Amenaza del Golfo (Under the Threat of the Gulf)." **Telemundo Houston** [*recorded video interview*]. 2025

"Will Texas become too hot for humans?." **BBC Future** — Sarah Griffiths [*print*]. 2023

"Climate change has sent temperatures soaring in Texas." **The Texas Tribune** — Erin Douglas, Yuriko Schumacher and Alex Ford [*print*]. 2023

"Texas could have foreseen 2021 cold-wave disaster, new study concludes." **Texas Climate News** — Bob Henson [*print*]. 2022

"Opinion: The risks of climate change are great - so are the rewards of solving it." **Houston Chronicle** — Andrew Dessler, James Doss-Gollin, and Katherine Hayhoe [*print*]. 2021

"The False Comfort of Higher Seawalls." **The New Republic** — Paola Rosa-Aquino [*print*]. 2019

"New Study Shows Promise for Long-Term Weather Forecasts in South America." **State of the Planet** — Elisabeth Gawthrop [*print*]. 2018

TEACHING

Rice University

CEVE 421/521: *Climate Risk Management*. Instructor. Spring 2024
CEVE 421/521: *Climate Risk Management*. Instructor. Spring 2023
CEVE 543: *Environmental Data Science*. Instructor. Spring 2022
CEVE 543: *Statistical-Physical Methods for Hydroclimate Extremes and Catastrophes*. Instructor. Fall 2025
CEVE 101: *Fundamentals of Civil and Environmental Engineering*. Instructor. Fall 2024
CEVE 543: *Data Science Methods for Climate Hazard Assessment*. Instructor. Fall 2023
CEVE 101: *Fundamentals of Civil and Environmental Engineering*. Instructor. Fall 2021

Columbia University

EAEEE 4257: *Environmental Data Analysis and Modeling*. Teaching Assistant. Spring 2018

ADVISING

GRADUATE STUDENTS

True Furrh: *Ph.D. in Civil and Environmental Engineering*, Rice University. **Committee Member**.

Dongwook Kim: *Ph.D. in Civil and Environmental Engineering*, Rice University. **Primary Advisor**.

Yuchen Lu: *Ph.D. in Civil and Environmental Engineering*, Rice University. **Primary Advisor**.

Kelsey Murphy: *Ph.D. in Earth, Environmental, and Planetary Sciences*, Rice University. **Committee Member**.

Jonah Schaechter: *Ph.D. in Civil and Environmental Engineering*, Rice University. **Primary Advisor**.

Valeriia Sobolevskaia: *Ph.D. in Earth, Environmental, and Planetary Sciences*, Rice University. **Committee Member**.

Karan Jakhar: *Ph.D. in Mechanical Engineering*, Rice University. Thesis: "Equation Discovery and Deep Learning for Geophysical Turbulence". **Committee Member**. 2025

Kyle Ostlind: *M.S. in Civil and Environmental Engineering*, Rice University. Thesis: "Evaluating Runoff Response to Nature-Based Solutions under Varying Development Scenarios in Upper Cypress Creak near Houston, Texas". **Committee Member**. 2025

Katlyn Schmeltzer: *MCEE in Civil and Environmental Engineering*, Rice University. Thesis: "Pre-Trained Long Short-Term Memory Network Performance for Streamflow Prediction in the Brazos River Basin". **Primary Advisor**. 2025

John A. Baer: *M.S. in Earth, Marine and Environmental Sciences*, University of North Carolina at Chapel Hill. Thesis: "Quantifying Precipitation-Induced Uncertainty in Flood Hazard Assessment in a Coastal Urban Area". **Committee Member**. 2024

Kendall Capshaw: *Ph.D. in Civil and Environmental Engineering*, Rice University. Thesis: "Modeling Coastal Petrochemical Infrastructure Risk, Resilience, and Cascading Community Consequences". **Committee Member**. 2024

Xinyue Luo: *Ph.D. in Earth, Environmental and Planetary Sciences*, Rice University. Thesis: "Characterizing the El Niño-Southern Oscillation and its North American Teleconnections over the Last Millennium". **Committee Member**. 2024

Anibal Tafur Gutierrez: *Ph.D. in Civil and Environmental Engineering*, Rice University. Thesis: "Methods and Tools for Risk-informed Resilience Enhancement of Coastal Intermodal Freight Networks". **Committee Member**. 2024

Matthew Garcia: *Ph.D. in Civil and Environmental Engineering*, Rice University. Thesis: "Novel Urban Floodplain Modeling Methods for Applications in Coupling Surrogate Machine Learning Methods". **Committee Member**. 2023

Mia Peeples: *M.S. in Civil and Environmental Engineering*, Rice University. Thesis: "Modeling Flood Reduction of Nature-Based Channel Modifications in Houston, TX". **Committee Member**. 2023

Xiangnan Zhou: *Ph.D. in Civil and Environmental Engineering*, Rice University. Thesis: "Resilience Planning for Water Distribution Systems". **Committee Member**. 2023

Raychel Bahnick: *M.S. in Civil and Environmental Engineering*, Rice University. Thesis: "Assessing Land Use Change and Subsidence Impact on Inland Flooding". **Committee Member**. 2022

Alyssa Graham: *M.S. in Civil and Environmental Engineering*, Rice University. Thesis: "Water Supply Vulnerability Testing and Robust Planning Analysis with Exploratory Modeling under Deep Uncertainty". **Committee Member**. 2022

Elizabeth Hoffmann: *M.S. in Civil and Environmental Engineering*, Rice University. Thesis: "Mapping Dynamic Watershed Response Under Increasing Development Using HEC-RAS 2D: A Case Study of the Big Creek Watershed in Fort Bend County". **Committee Member**. 2022

Chunshan Liu: *Ph.D. in Statistics*, Rice University. Thesis: "Bayesian Graphical Models for Multivariate Time Series". **Committee Member**. 2022

Xiaoyu (Toby) Li: *M.S. in Civil and Environmental Engineering*, Rice University. Thesis: "Evaluating the Effects of Project Brays Mitigation Using Unsteady HEC-RAS Hydraulic Modeling: Application to Meyerland in Houston, TX". **Committee Member**. 2021

UNDERGRADUATE RESEARCH ASSISTANTS

Zain Rahman: *B.S. in Computer Science*, Rice University. 2027
Kyle Olcott: *B.S. in Civil and Environmental Engineering*, Rice University. 2025
Sophia Prieto: *B.S. in Statistics*, Rice University. 2023
John Cook: *B.S. in Civil and Environmental Engineering*, Rice University. 2022

ADVISEE AWARDS

Karen and John Huff Graduate Fellowship in Civil and Environmental Engineering, **Dongwook Kim**. 2025
H.W. Reeves Endowed Scholarship, **Yuchen Lu**. 2022

SESSIONS ORGANIZED

Co-Organizer. *Nature-Based Solutions for a Resilient Gulf Coast Workshop* at **Rice University**, Houston, TX. 2025

Primary Convener. *H31G - Integrating Social, Scientific, and Engineering Approaches to Identify and Address Gaps in Water Infrastructure and Household Water Security* at **American Geophysical Union Fall Meeting**, San Francisco, CA. 2023

Convener. *NH41C - Hybrid Modeling and Digital Twin Systems for Flood Hazard Prediction and Risk Assessment at Different Spatial Scales* at **American Geophysical Union Fall Meeting**, Washington, DC. 2023

Chair. *H44G – Water and Society: Interdisciplinary Perspectives on Hydroclimatic Forecasting for Water Resources Decision Making* at **American Geophysical Union Fall Meeting**, New Orleans, LA. 2021

Primary Convener. *NH53 – Emerging Needs and Approaches for Climate Services: Understanding and Developing Innovative Approaches to User-Oriented Climate Services* at **American Geophysical Union Fall Meeting**, San Francisco, CA. 2019

Student Organizer. *Earth and Environmental Engineering Student Research Symposium* at **Columbia University**, New York, NY. 2018

Student Organizer. *Earth and Environmental Engineering Student Research Symposium* at **Columbia University**, New York, NY. 2017

PEER REVIEW

Journals: AGU Advances; Climate Risk Management; Climatic Change; Communications Earth and Environment; Earth's Future; Energy Technology; Environmental Data Science; Environmental Research Letters; Geophysical Research Letters; Hydrology and Earth System Sciences; Joule; Journal of Applied Meteorology and Climatology; Journal of Hydrology; Journal of Water Resources Management and Planning; Oxford Journal of Development Studies; Water Resources Research; Water Security; Weather, Climate, and Society.

Funding Agencies: Department of Energy (BER); National Science Foundation.

Other: Electric Power Research Institute (EPRI); Texas Water Development Board (TWDB).

ADDITIONAL EXPERIENCE

Social and Behavioral Research - Basic/Refresher — *CITI program*. 2025–2028

Panel Fellow — *NSF CMMI's Game Changer Academies for Advancing Research Innovation*. 2021

Visiting Graduate Researcher — *Lamontagne Research Group, Department of Civil and Environmental Engineering, Tufts University, Medford, MA*. 2019–2020

Graduate Research Fellow — *Columbia Water Center, Department of Earth and Environmental Engineering, Columbia University, New York, NY*. 2015–2020

Summer School Participant — *Fluid Dynamics of Sustainability and the Environment, Cambridge University, Cambridge, England*. 2016

Education Policy Intern — *Elm City Communities / New Haven Housing Authority, New Haven, CT*. 2015

President (2014), Design Lead (2013), Member (2012, 2015) — *Engineers Without Borders, Yale Student Chapter, New Haven, CT*. 2012–2015

Undergraduate Research Assistant — *Lab of Jaehong Kim, Department of Chemical and Environmental Engineering, Yale University, New Haven, CT*. 2014–2015

Visiting Undergraduate Researcher — *Water and Climate Risk Lab, Department of Hydraulic and Environmental Engineering, Universidade Federal do Ceará, Fortaleza, Brazil*. 2014

Mechanical Design Intern — *Slingshot Team, DEKA Research \& Development, Manchester, NH*. 2013

Undergraduate Research Assistant — *Lab of Jan Schroers, Department of Mechanical Engineering and Materials Science, Yale University, New Haven, CT*. 2012

Ikatú Agua Intern — *Fundación Paraguaya, Asunción, Paraguay*. 2012