

Rice University  
Department of Civil and Environmental Engineering  
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jdossgollin   
James Doss-Gollin 

## James Doss-Gollin

### research interests

Climate risk management and adaptation  
Decision-making under uncertainty  
Dynamics and spatiotemporal clustering of hydroclimate extremes  
Probabilistic modeling and uncertainty quantification

### appointments

#### Rice University

*Assistant Professor*, Department of Civil & Environmental Engineering, 2021–present.  
*Adjunct Professor*, Department of Civil & Environmental Engineering, 2020.

#### The Pennsylvania State University

*Postdoctoral Scholar*, Earth & Environmental Systems Institute, 2020.  
adviser: Klaus Keller

### education

#### Columbia University

*Ph.D.*, Earth & Environmental Engineering, 2020.  
*M.S.*, Earth & Environmental Engineering, 2016.  
adviser: Upmanu Lall

#### Yale University

*B.S.*, Mechanical Engineering, 2011.

### awards

**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

**Co-PI**, “Evaluating the Past and Future of Mississippi River Hydroclimatology to Constrain Risk via Integrated Climate Modeling, Observations, and Reconstructions”. *NSF: Atmospheric & Geospace Sciences*, \$441,342. 2022–2025.

**Co-PI**, “EAGER: Participatory Design for Water Quality Monitoring of Highly Decentralized Water Infrastructure Systems”. PI: Alicia Cooperman. *NSF: Strengthening America's Infrastructure*, \$85,046 (total: \$300,000). 2022–2023.

**PI**, “Blending Observations of Extreme Precipitation across Space and Time to Improve Stormwater Management in Houston”. *Rice University Sustainable Futures Fund*, \$50,000. 2022–2023.

### journal articles

**Doss-Gollin, James**, Farnham, David J., Lall, Upmanu, and Modi, Vijay. 2021. “How Unprecedented Was the February 2021 Texas Cold Snap?” In: *Environmental Research Letters*. DOI: 10.1088/1748-9326/ac0278.

- Doss-Gollin, James**, Farnham, David J., Ho, Michelle, and Lall, Upmanu. 2020. "Adaptation over Fatalism: Leveraging High-Impact Climate Disasters to Boost Societal Resilience". In: *Journal of Water Resources Planning and Management* 146.4. DOI: 10.1061/(asce)wr.1943-5452.0001190.
- Rözer, Viktor, Kreibich, Heidi, Schröter, Kai, Müller, Meike, Sairam, Nivedita, **Doss-Gollin, James**, Lall, Upmanu, and Merz, Bruno. 2019. "Probabilistic Models Significantly Reduce Uncertainty in Hurricane Harvey Pluvial Flood Loss Estimates". In: *Earth's Future* 7.4. DOI: 10.1029/2018ef001074.
- Doss-Gollin, James**, Farnham, David J., Steinschneider, Scott, and Lall, Upmanu. 2019. "Robust Adaptation to Multiscale Climate Variability". In: *Earth's Future* 7.7, pp. 734–747. DOI: 10.1029/2019ef001154.
- Doss-Gollin, James**, Muñoz, Ángel G, Mason, Simon J, and Pastén, Max. 2018. "Heavy Rainfall in Paraguay during the 2015-2016 Austral Summer: Causes and Sub-Seasonal-to-Seasonal Predictive Skill". In: *Journal of Climate* 31.17, pp. 6669–6685. DOI: 10.1175/jcli-d-17-0805.1.
- Farnham, David J, **Doss-Gollin, James**, and Lall, Upmanu. 2018. "Regional Extreme Precipitation Events: Robust Inference from Credibly Simulated GCM Variables". In: *Water Resources Research* 54.6. DOI: 10.1002/2017wr021318.
- Doss-Gollin, James**, de Souza Filho, Francisco de Assis, and da Silva, Francisco Osny Enéas. 2015. "Analytic Modeling of Rainwater Harvesting in the Brazilian Semiarid Northeast". In: *Journal of the American Water Resources Association* 52.1, pp. 129–137. DOI: 10.1111/1752-1688.12376.

dissertation

- Doss-Gollin, James**. 2020. "Sequential Adaptation through Prediction of Structured Climate Risk". Columbia University. DOI: 10.7916/d8-p9ha-a055.

invited talks

- "Extreme Impacts Don't Require Extreme Weather: Lessons from the February 2021 Texas Blackouts"**, Outreach Event: Science is for Everyone, *American Meteorological Society*. Remote Presentation, 2022-01-25.
- "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, 2021-12-09.
- "Panelist"**, Tail events: Prediction, Planning, and Performance, *Harvard Electricity Policy Group*. Remote Presentation, 2021-09-28.
- "Towards Adaptive Resilience: Managing Flood Risks in a Changing World"**, Technical Webinar, *ASCE Central Jersey Branch*. Remote Presentation, 2021-04-28.
- "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, 2020-01-29.
- "Prediction and Implications of Structured Climate Risk for Sequential Adaptation under Deep Uncertainty"**, Department of Civil and Environmental Engineering Seminar, *Rice University*. Houston, TX, 2020-01-27.
- "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, 2020-01-07.
- "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, 2016-09-02.
- "Understanding the Physical Drivers of Extreme Rainfall for Flood Prediction"**, Oxford Water Network, *Oxford University*. Oxford, England, 2016-08-26.

conference  
proceedings

- Geldner, Nathan, **Doss-Gollin, James**, Keller, Klaus, and Johnson, David R. 2021. "Characterization of the Equity-Efficiency Tradeoff in Targeted Residential Coastal Protection Projects". In: 2021 Annual Meeting of the Society for Risk Analysis. Virtual.

- Zhou, Xiangnan, Duenas-Osorio, Leonardo, Liu, Lu, Stadler, Lauren, **Doss-Gollin, James**, Getachew, Bezawit, and Li, Qilin. 2021. "Distributed Water and Wastewater Infrastructure System for Climate Change Adaption: A Case Study in the City of Lumberton, NC". In: *American Geophysical Union Fall Meeting*. AGU.
- Doss-Gollin, James**, Farnham, David J., Lall, Upmanu, and Modi, Vijay. 2021. "How Unprecedented Was the February 2021 Texas Cold Snap?" In: *AGU Fall Meeting 2021*. AGU.
- Lall, Upmanu, Amonkar, Yash Vijay, Farnham, David J, Modi, Vijay, and **Doss-Gollin, James**. 2021. "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: *American Geophysical Union Fall Meeting*. New Orleans, LA.
- Doss-Gollin, James** and Keller, Klaus. 2021. "What Scenario Should We Design for? Insights from Home Elevation for the Multiple PDF Problem". In: *American Geophysical Union Fall Meeting*. New Orleans, LA.
- Lall, Upmanu, Arumugam, Sankar, Cioffi, Francesco, Devineni, Naresh, **Doss-Gollin, James**, Kwon, Hyun-Han, and Rajagopalan, Balaji. 2020. "America's Water: Multiscale Forecasting and Innovation in Infrastructure Design & Management Instruments Is Critical for Climate Adaptation". In: *American Geophysical Union Fall Meeting*. New Orleans, LA.
- Amonkar, Yash Vijay, **Doss-Gollin, James**, and Lall, Upmanu. 2019. "Preserving Long-Term Variability in Simulation of Multisite Streamflow Extremes". In: *American Geophysical Union Fall Meeting*. San Francisco, CA. DOI: 10.6084/m9.figshare.11444238.v1.
- Doss-Gollin, James**, Lall, Upmanu, and Lamontagne, Jonathan. 2019. "Towards Adaptive Resilience: Managing Uncertainties and Exploiting Predictability across Timescales". In: *American Geophysical Union Fall Meeting*. San Francisco, CA. DOI: 10.6084/m9.figshare.11397936.v1.
- Doss-Gollin, James**, Farnham, David J, Steinschneider, Scott, and Lall, Upmanu. 2018. "Robust Adaptation to Cyclical Climate Risk". In: *American Geophysical Union Fall Meeting*. Washington, DC. DOI: 10.13140/rg.2.2.28447.20649.
- Rözer, Viktor, Kreibich, Heidi, Schröter, Kai, **Doss-Gollin, James**, Lall, Upmanu, and Merz, Bruno. 2017. "BN-FLEMOps Pluvial - A Probabilistic Multi-Variable Loss Estimation Model for Pluvial Floods". In: *American Geophysical Union Fall Meeting*. New Orleans, LA.
- Doss-Gollin, James**, Muñoz, Ángel G, Mason, Simon J, and Pastén, Max. 2017. "Causes and Model Skill of the Persistent Intense Rainfall and Flooding in Paraguay during the Austral Summer 2015-2016". In: *American Geophysical Union Fall Meeting*. New Orleans, LA. DOI: 10.13140/rg.2.2.20146.30406.
- Doss-Gollin, James**, Farnham, David J, and Lall, Upmanu. 2017. "Designing and Operating Infrastructure for Nonstationary Flood Risk Management". In: *American Geophysical Union Fall Meeting*. New Orleans, LA. DOI: 10.13140/rg.2.2.16110.46403.
- Faranda, Davide, Messori, Gabriele, **Doss-Gollin, James**, Farnham, David J, Lall, Upmanu, and Yiou, Pascal. 2017. "Dynamics and Thermodynamics of Weather Extremes: A Dynamical Systems Approach". In: *American Geophysical Union Fall Meeting*. New Orleans, LA.
- Spence, Caitlin M, Brown, Casey, and **Doss-Gollin, James**. 2016. "Exploiting Synoptic-Scale Climate Processes to Develop Nonstationary, Probabilistic Flood Hazard Projections". In: *American Geophysical Union Fall Meeting*. San Francisco, CA.
- Doss-Gollin, James**, Farnham, David J, and Lall, Upmanu. 2016. "Global-Local Interactions Modulate Tropical Moisture Exports to the Ohio River Basin". In: *American Geophysical Union Fall Meeting*. San Francisco, CA. DOI: 10.13140/rg.2.2.36009.19044.
- Farnham, David J, **Doss-Gollin, James**, and Lall, Upmanu. 2016. "Space-Time Characteristics and Statistical Predictability of Extreme Daily Precipitation Events in the Ohio River Basin". In: *American Geophysical Union Fall Meeting*. San Francisco, CA.

Farnham, David J, Lall, Upmanu, Kwon, Hyun-Han, and **Doss-Gollin, James**. 2015. "Moisture Transport and Extreme Precipitation in Mid-Latitudes". In: *American Geophysical Union Fall Meeting*. San Francisco, CA.

Araújo Júnior, Luiz Martins, de Souza Filho, Francisco de Assis, da Silva Silveira, Cleiton, Aragão Dias, Tyhago, and **Doss-Gollin, James**. 2014. "Análise dos eventos de seca no Nordeste Setentrional Brasileiro com base no índice de precipitação normalizada". In: *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, James**, de Souza Filho, Francisco de Assis, and da Silva, Francisco Osny Enéas. 2014. "Considerações sobre a sustentabilidade hídrica de cisternas para captação de chuva no Semiárido Brasileiro". In: *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.

workshop  
presentations

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

**"Adaptive Resilience through Real Options and Deep Reinforcement Learning"**, Doctoral Consortium on Computational Sustainability, *Carnegie Mellon University*. Pittsburgh, PA. Oral Presentation. Oct. 2019.

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

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

**"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. Oral Presentation. Sept. 2017.

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

**"Statistical-Dynamical Analysis of Climate Projections for Flood Infrastructure Design"**, Interdisciplinary Ph.D. Workshop in Sustainable Development 2017, *Columbia University*. New York, NY. Oral Presentation. Apr. 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 Presentation. Dec. 2016.

teaching

**Columbia University**

Environmental Data Analysis and Modeling. Teaching Assistant. Spring 2018.

**Rice University**

Environmental Data Science. Instructor. Spring 2022.

Fundamentals of Civil and Environmental Engineering. Instructor. Fall 2021.

advising

**Committee Member** for Matthew Garcia, *Ph.D. in Civil and Environmental Engineering*, Rice University. 2022 (Anticipated).

**Committee Member** for Chunshan Liu, *Ph.D. in Statistics*, Rice University. 2022 (Anticipated).

**Committee Member** for Toby Li, *M.S. in Civil and Environmental Engineering*, Rice University. 2021.

**Adviser** for Kristina Cibor, *Ph.D. in Civil and Environmental Engineering*, Rice University. 2021–Present.

**Adviser** for Yuchen Lu, *Ph.D. in Civil and Environmental Engineering*, Rice University. 2021–Present.

media coverage	<p>The False Comfort of Higher Seawalls, <i>Paola Rosa-Aquino</i>, <b>The New Republic</b>, 2019-10-29.</p> <p>New Study Shows Promise for Long-Term Weather Forecasts in South America, <i>Elisabeth Gawthrop</i>, <b>State of the Planet</b>, 2018-08-06.</p>
opinion	<p>Opinion: The risks of climate change are great - so are the rewards of solving it, <i>Andrew Dessler, James Doss-Gollin, and Katherine Hayhoe</i>, <b>Houston Chronicle</b>, 2021-09-01.</p>
workshops and sessions organized	<p><b>Chair</b>, H44G – <i>Water and Society: Interdisciplinary Perspectives on Hydroclimatic Forecasting for Water Resources Decision Making</i>, American Geophysical Union Fall Meeting, New Orleans, LA. 2021-12-16.</p> <p><b>Primary Convenor</b>, NH53 – <i>Emerging Needs and Approaches for Climate Services: Understanding and Developing Innovative Approaches to User-Oriented Climate Services</i>, American Geophysical Union Fall Meeting, San Francisco, CA. 2019-12-23.</p> <p><b>Student Organizer</b>, <i>Earth and Environmental Engineering Student Research Symposium</i>, Columbia University, New York, NY. 2018-10-12.</p> <p><b>Student Organizer</b>, <i>Earth and Environmental Engineering Student Research Symposium</i>, Columbia University, New York, NY. 2017-10-27.</p>
peer review	<p>AGU Advances</p> <p>Climatic Change</p> <p>Earth's Future</p> <p>Environmental Research Letters</p> <p>Geophysical Research Letters</p> <p>Hydrology and Earth System Sciences</p> <p>Joule</p> <p>Journal of Applied Meteorology and Climatology</p> <p>Journal of Hydrology</p> <p>Journal of Water Resources Management and Planning</p> <p>Oxford Journal of Development Studies</p> <p>Water Resources Research</p> <p>Water Security</p> <p>Weather, Climate, and Society</p> <p>National Science Foundation</p>
additional experience and training	<p><b>Social &amp; Behavioral Research - Basic/Refresher (record #46214890)</b>, CITI program. 2022–2025.</p> <p><b>Social and Behavioral Responsible Conduct of Research (record #46214894)</b>, CITI program. 2022.</p> <p><b>Panel Fellow</b>, NSF CMMI's Game Changer Academies for Advancing Research Innovation. 2021.</p> <p><b>Visiting Graduate Researcher</b>, Lamontagne Research Group, Department of Civil and Environmental Engineering, Tufts University, Medford, MA. 2019–2020.</p> <p><b>Graduate Research Fellow</b>, Columbia Water Center, Department of Earth and Environmental Engineering, Columbia University, New York, NY. 2015–2020.</p> <p><b>Summer School Participant</b>, Fluid Dynamics of Sustainability and the Environment, Cambridge University, Cambridge, England. 2016.</p> <p><b>Education Policy Intern</b>, Elm City Communities / New Haven Housing Authority, New Haven, CT. 2015.</p> <p><b>Undergraduate Research Assistant</b>, Lab of Jaehong Kim, Department of Chemical and Environmental Engineering, Yale University, New Haven, CT. 2014–2015.</p> <p><b>President (2014), Design Lead (2013), Member (2012, 2015)</b>, Engineers Without Borders, Yale Student Chapter, New Haven, CT. 2012–2015.</p>

**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.