

# James Doss-Gollin

## Education

- Present **Ph.D. Candidate**, *Department of Earth and Environmental Engineering*, Columbia University, New York, NY.  
○ NSF Graduate Research Fellow  
○ Columbia University Presidential Fellow
- 2016 **M.S.**, *Department of Earth and Environmental Engineering*, Columbia University, New York, NY.
- 2015 **B.S.**, *Department of Mechanical Engineering*, Yale University, New Haven, CT.  
○ Graduated *Cum Laude*  
○ Distinction in major

## Research Experience

- 2015–Present **Graduate Research Fellow**, *Columbia Water Center*, Department of Earth and Environmental Engineering, Columbia University.
- 2019–2020 **Visiting Student Researcher**, *Lamontagne Research Group*, Department of Civil and Environmental Engineering, Tufts University.
- 2014–2015 **Undergraduate Research Assistant**, *Lab of Jaehong Kim*, Department of Chemical and Environmental Engineering, Yale University.
- 2014–2015 **Visiting Student Researcher**, *Water and Climate Risk Lab*, hydraulic and Environmental Engineering Department, Universidade Federal do Ceará, Fortaleza, Brazil.
- 2013 **Mechanical Design Intern**, *Slingshot Team*, DEKA Research and Development, Manchester, NH.
- 2012 **Undergraduate Research Assistant**, *Lab of Jan Schroers*, Department of Mechanical Engineering and Materials Science, Yale University.
- 2012 **Summer Intern**, *Ikatú Agua Project*, Fundación Paraguaya, Asunción, Paraguay.

## Honors and Awards

- 2018 **Nickolas and Liliana Themelis Fellowship**, *Fu Foundation School of Engineering and Applied Science*, Columbia University.
- 2017 **Graduate Research Fellowship**, *Climate and Large-Scale Atmospheric Dynamics*, National Science Foundation.
- 2015 **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 **B.S. Cum Laude**, Yale University.
- 2014 **Larry Coben '79 Fellowship**, Yale University.
- 2013 **Vance-Carter Travel Award**, Yale University.
- 2012 **Vance-Carter Travel Award**, Yale University.

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## Publications and Presentations

### Peer-Reviewed Journal Articles

- [6] **James Doss-Gollin**, David J. Farnham, Michelle Ho, and Upmanu Lall. “Adaptation over Fatalism: Leveraging High-Impact Climate Disasters to Boost Societal Resilience”. *Journal of Water Resources Planning and Management* 146.4 (2020). DOI: 10 . 1061 / (ASCE) WR . 1943 - 5452 . 0001190.
- [5] **James Doss-Gollin**, David J. Farnham, Scott Steinschneider, and Upmanu Lall. “Robust Adaptation to Multiscale Climate Variability”. *Earth’s Future* 7.7 (2019). DOI: 10 . 1029 / 2019EF001154.
- [4] Viktor Rözer, Heidi Kreibich, Kai Schröter, Meike Müller, Nivedita Sairam, **James Doss-Gollin**, Upmanu Lall, and Bruno Merz. “Probabilistic Models Significantly Reduce Uncertainty in Hurricane Harvey Pluvial Flood Loss Estimates”. *Earth’s Future* 7.4 (2019). DOI: 10 . 1029 / 2018EF001074.
- [3] **James Doss-Gollin**, Ángel G Muñoz, Simon J Mason, and Max Pastén. “Heavy Rainfall in Paraguay during the 2015-2016 Austral Summer: Causes and Sub-Seasonal-to-Seasonal Predictive Skill”. *Journal of Climate* 31.17 (2018). DOI: 10 . 1175 / JCLI - D - 17 - 0805 . 1.
- [2] David J Farnham, **James Doss-Gollin**, and Upmanu Lall. “Regional Extreme Precipitation Events: Robust Inference from Credibly Simulated GCM Variables”. *Water Resources Research* 54.6 (2018). DOI: 10 . 1002 / 2017wr021318.
- [1] **James Doss-Gollin**, Francisco de Assis de Souza Filho, and Francisco Osny Enéas da Silva. “Analytic Modeling of Rainwater Harvesting in the Brazilian Semiarid Northeast”. *Journal of the American Water Resources Association* 52.1 (2015). DOI: 10 . 1111 / 1752 - 1688 . 12376.

### Conference Papers and Presentations

- [13] Yash Vijay Amonkar, **James Doss-Gollin**, and Upmanu Lall. “Preserving Long-Term Variability in Simulation of Multisite Streamflow Extremes”. *American Geophysical Union Fall Meeting*. San Francisco, CA, 2019. DOI: 10 . 6084 / m9 . figshare . 11444238 . v1.
- [12] **James Doss-Gollin**, Upmanu Lall, and Jonathan Lamontagne. “Towards Adaptive Resilience: Managing Uncertainties and Exploiting Predictability across Timescales”. *American Geophysical Union Fall Meeting*. San Francisco, CA, 2019. DOI: 10 . 6084 / m9 . figshare . 11397936 . v1.
- [11] **James Doss-Gollin**, David J Farnham, Scott Steinschneider, and Upmanu Lall. “Robust Adaptation to Cyclical Climate Risk”. *American Geophysical Union Fall Meeting*. Washington, DC, 2018. DOI: 10 . 13140 / RG . 2 . 2 . 28447 . 20649.
- [10] **James Doss-Gollin**, David J Farnham, and Upmanu Lall. “Designing and Operating Infrastructure for Nonstationary Flood Risk Management”. *American Geophysical Union Fall Meeting*. New Orleans, LA, 2017. DOI: 10 . 13140 / RG . 2 . 2 . 16110 . 46403.
- [9] **James Doss-Gollin**, Ángel G Muñoz, Simon J Mason, and Max Pastén. “Causes and Model Skill of the Persistent Intense Rainfall and Flooding in Paraguay during the Austral Summer 2015-2016”. *American Geophysical Union Fall Meeting*. New Orleans, LA, 2017. DOI: 10 . 13140 / RG . 2 . 2 . 20146 . 30406.
- [8] Davide Faranda, Gabriele Messori, **James Doss-Gollin**, David J Farnham, Upmanu Lall, and Pascal Yiou. “Dynamics and Thermodynamics of Weather Extremes: A Dynamical Systems Approach”. *American Geophysical Union Fall Meeting*. New Orleans, LA, 2017.

- [7] Viktor Rözer, Heidi Kreibich, Kai Schröter, **James Doss-Gollin**, Upmanu Lall, and Bruno Merz. “BN-FLEMOps Pluvial - A Probabilistic Multi-Variable Loss Estimation Model for Pluvial Floods”. *American Geophysical Union Fall Meeting*. New Orleans, LA, 2017.
- [6] **James Doss-Gollin**, David J Farnham, and Upmanu Lall. “Global-Local Interactions Modulate Tropical Moisture Exports to the Ohio River Basin”. *American Geophysical Union Fall Meeting*. San Francisco, CA, 2016. DOI: 10.13140/RG.2.2.36009.19044.
- [5] David J Farnham, **James Doss-Gollin**, and Upmanu Lall. “Space-Time Characteristics and Statistical Predictability of Extreme Daily Precipitation Events in the Ohio River Basin”. *American Geophysical Union Fall Meeting*. San Francisco, CA, 2016.
- [4] Caitlin M Spence, Casey Brown, and **James Doss-Gollin**. “Exploiting Synoptic-Scale Climate Processes to Develop Nonstationary, Probabilistic Flood Hazard Projections”. *American Geophysical Union Fall Meeting*. 2016.
- [3] David J Farnham, Upmanu Lall, Hyun-Han Kwon, and **James Doss-Gollin**. “Moisture Transport and Extreme Precipitation in Mid-Latitudes”. *American Geophysical Union Fall Meeting*. San Francisco, CA, 2015.
- [2] Luiz Martins Araújo Júnior, Francisco de Assis de Souza Filho, Cleiton da Silva Silveira, Tyhago Aragão Dias, and **James Doss-Gollin**. “Análise dos eventos de seca no Nordeste Setentrional Brasileiro vom case no índice de precipitação normalizada”. *XII Simpósio de Recursos Hídricos Do Nordeste*. Natal, Rio Grande do Norte, Brasil: Associação Brasileira de Recursos Hídricos (ABRH), 2014. DOI: 10.13140/RG.2.1.4610.7685.
- [1] **James Doss-Gollin**, Francisco de Assis de Souza Filho, and Francisco Osny Enéas da Silva. “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), 2014. DOI: 10.13140/RG.2.1.4086.4807.

#### Manuscripts Accepted, Under Review, and In Preparation

- [2] Yash Vijay Amonkar, **James Doss-Gollin**, and Upmanu Lall. “Diagnosis, Simulation and Prediction of Inter-Annual and Longer Variations of Multi-Site, Annual Maximum Streamflow at a Regional Scale in the Ohio River Basin”.
- [1] **James Doss-Gollin**, Upmanu Lall, and Timothy A Cohn. “Nonparametric Estimation of Autocorrelation Functions and Spectra of Irregularly Sampled Data”.

#### Workshop Presentations

- 2019-10-18 **Adaptive Resilience Through Real Options and Deep Reinforcement Learning**, *Doctoral Consortium on Computational Sustainability*, Carnegie Mellon University, Pittsburgh, PA, talk.
- 2019-04-13 **Evaluating staged investments in critical infrastructure for climate adaptation**, *Interdisciplinary Ph.D. Workshop in Sustainable Development 2019*, Columbia University, New York, NY, talk.
- 2018-11-08 **Robust Adaptation to Multi-Scale Climate Variability**, *The Nexus of Climate Data, Insurance, and Adaptive Capacity*, Asheville, NC, poster.
- 2017-09-10 **Extreme Rainfall in Paraguay During the 2015-16 Austral Summer**, *North East Graduate Student Water Symposium*, University of Massachusetts Amherst, Amherst, MA, talk.
- 2017-05-31 **Regional Intense Precipitation: Inferences From GCM Atmospheric Circulation Fields**, *Modeling Research in the Cloud*, NCAR, Boulder, Colorado, poster.

- 2017-04-21 **Statistical-Dynamical Analysis of Climate Projections for Flood Infrastructure Design**, *Interdisciplinary Ph.D. Workshop in Sustainable Development 2017*, Columbia University, New York, NY, talk.
- 2016-12-07 **Physical Mechanisms and Subseasonal-To-Seasonal Predictability of Persistent Intense Rainfall and Paraguay River Flooding During the Austral Summer 2015/2016**, *Workshop on Subseasonal to Seasonal Predictability of Extreme Weather and Climate*, Columbia University, New York, NY, poster.
- [Invited Talks](#)
- 2020-01-29 **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, talk.
- 2020-01-27 **Ibid**, *Department of Civil and Environmental Engineering*, Rice University, Houston, TX, talk.
- 2020-01-07 **Ibid**, *Complex Systems Simulation and Optimization Group*, National Renewable Energy Laboratory, Golden, CO, talk.
- 2016-09-02 **Drivers Of Extreme Rainfall: Atmospheric Circulation Patterns And Regional Intense Rainfall In The Ohio River Basin**, *European Flood Awareness System Group*, European Centre for Medium Range Weather Forecasting, Reading, England, talk.
- 2016-08-26 **Understanding The Physical Drivers Of Extreme Rainfall For Flood Prediction**, *Oxford Water Network*, Oxford University, Oxford, England, talk.

## Teaching Experience

### Columbia University

- 2018 **Teaching assistant**, *Environmental Data Modeling and Analysis*.
- Wrote and graded problem sets for 40 masters-level students
  - Held regular office hours and gave two lectures: Introduction to R and RStudio and Introduction to Bayesian Methods
- 2017 **Guest Lecturer**, *Water Systems Analysis*.
- Gave lecture: Using Climate Information for Water Systems Analysis

### Non-Academic

- 2019 **Python and Data Science Facilitator**, *Oliver Wyman Group*.
- Led multiple weeklong courses to teach fundamentals of Python and data science to over 100 consultants at multinational company.

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## Community Engagement

Peer Reviewer A verified record of reviews is available on Publons

- Journal of Applied Meteorology and Climatology
- Journal of Hydrology
- Journal of Water Resources Management and Planning
- Natural Hazards and Earth System Sciences
- Oxford Journal of Development Studies
- Water Resources Research
- Water Security

Professional Memberships Society for Decision Making under Deep Uncertainty (DMDU), American Society of Civil Engineers (ASCE), American Geophysical Union (AGU), American Meteorological Society (AMS)

### Media Coverage

2019-10-29 **The False Comfort of Higher Seawalls**, *The New Republic*.

2018-08-06 **New Study Shows Promise for Long-Term Weather Forecasts in South America**, *State of the Planet*.

### Conferences and Workshops Organized

2019-12-13 **Primary Convener**, *H51A 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.

2018-10-12 **Student Organizer**, *Earth and Environmental Engineering Student Research Symposium*, Columbia University, New York, NY.

2017-10-27 **Student Organizer**, *Earth and Environmental Engineering Student Research Symposium*, Columbia University, New York, NY.

### Public Presentations

2019-09-21 **Liquid Futures: Envisioning a World with Water for All**, *Lenfest Center for the Arts*.

### Outreach and Volunteering

2016–2017 **Volunteer**, *Youth Career Connect*, New York City Department of Education, New York, NY. Mentored New York high school juniors and seniors interested in STEM careers.

2015 **Summer Intern**, *Education Policy Initiative*, New Haven Housing Authority / Elm City Communities, New Haven, CT.  
Developed summer curriculum and researched policy interventions to support literacy and youth engagement and reduce multi-generational poverty.

2012–2015 **Founder and President**, *New Haven REACH*, None, New Haven, CT.  
Founded and led a program to support New Haven high school seniors applying to college Recruited, trained, and coordinated over 50 volunteer mentors from Yale.

2012–2015 **President**, *Engineers Without Borders*, Yale University Chapter, New Haven, CT.  
As president (2014), design lead (2013), and member (2012, 2015), coordinated design of water supply system in village of 1500 in northwestern Cameroon.

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## Skills

### Computer

lang Python (and PyData/Pangeo ecosystem), R (and Tidyverse), bash, Matlab, C++  
ML stan, PyMC3, tensorflow, keras, openAI gym

doc Markdown, pandoc, RMarkdown,  $\LaTeX$ , jupyter, jekyll, pelican

SWE Docker, git, conda, make, pytest

### Languages

English Native Speaker

Spanish Full professional proficiency

Portuguese Professional working proficiency

French Elementary proficiency

Italian Elementary proficiency

Guaraní Basic