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# 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.
- Senior Project: "Adapting UVC-LEDs for Portable Water Purification"'
- Graduated *Cum Laude*
- Distinction in major

## Research Experience

2015–Present **Graduate Research Fellow**, *Columbia Water Center*, Department of Earth and Environmental Engineering, Columbia 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, Paraguaya.

## 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.

## Publications and Presentations

## Peer-Reviewed Journal Articles

[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 Geophsyical Union Fall Meeting*. San Francisco, CA, 2019.

[12] **James Doss-Gollin**, Upmanu Lall, and Jonathan Lamontagne. "Towards Adaptive Resilience: Managing Uncertainties and Exploiting Predictability across Timescales". *American Geophsyical 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 Geophsyical 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 Geophsyical 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 Geophsyical 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 Geophsyical 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 Geophsyical 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 Geophsyical 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 Geophsyical 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*. San Francisco, CA. 2016.

[3] David J Farnham, Upmanu Lall, Hyun-Han Kwon, and **James Doss-Gollin**. "Moisture Transport and Extreme Precipitation in Mid-Latitudes". *American Geophsyical 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 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), 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

[4] 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".

[3] **James Doss-Gollin**, David J Farnham, Michelle Ho, and Upmanu Lall. "Adaptation over Fatalism: Leveraging High-Impact Climate Disasters to Boost Societal Resilience". Editorial. Accepted to Journal of Water Resources Planning and Management.

[2] **James Doss-Gollin**, Upmanu Lall, and Timothy A Cohn. "Nonparametric Estimation of Autocorrelation Functions and Spectra Of Irregularly Sampled Data".

[1] **James Doss-Gollin**, Upmanu Lall, and Jonathan R Lamontagne. "Towards Adaptive Resilience: Managing Multiple Uncertainties with Real Options and Deep Reinforcement Learning".

### 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

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.

## Community Engagement

2017-Present **Peer Reviewer**.
*A verified record of reviews is available at* `https://publons.com/a/1468228/`
- Journal of Applied Meteorology and Climatology
- Journal of Hydrology
- Natural Hazards and Earth System Sciences
- Oxford Journal of Development Studies
- 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)

### 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.

### Outreach and Volunteering

2016–2017 **Volunteer**, *Youth Career Connect*, 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*, 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.

2011–2015 **President**, *Engineers Without Borders*, Yale Student Chapter.
As member (2011-2012, 2015), design lead (2013) and president (2014) led student team in design and construction of water supply system for rural community of 1500 in Northwestern Cameroon.

## Skills

### Computer

| | |
|---|---|
| lang | Python (and PyData 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 |

### Language

| | |
|---|---|
| English | Native speaker |
| Spanish | Full professional proficiency |
| Portuguese | Professional working proficiency |
| French | Elementary proficiency |
| Italian | Elementary proficiency |
| Guaraní | Basic |