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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

Peer Reviewer A verified record of reviews is available on Publons

- 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 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 leteracy 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.

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

Languages

English Native Speaker

Spanish Full professional proficiency

Portuguese Professional working proficiency

French Elementary proficiency

Italian Elementary proficiency

Guaraní Basic