Curriculum Vitae

Danielle Touma, Ph.D.

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Education

2018	Stanford University, Earth System Science, Ph.D.
2011	North Carolina State University, Civil Engineering, M.S.
2009	North Carolina State University, Civil Engineering, B.S.

Academic Appointments

2023-	Research Associate, University of Texas Institute for Geophysics, Austin, TX
2021-2023	Advanced Study Program (ASP) Postdoctoral Fellow, National Center for Atmospheric Research, Boulder, CO
2022-2023	Research Scientist II, Colorado State University, Fort Collins, CO
2019-2021	Postdoctoral Scholar, University of California, Santa Barbara, Santa Barbara, CA
2020-2021	Visiting Researcher, National Center for Atmospheric Research, Boulder, CO
2013-2018	Graduate Research Assistant, Stanford University, Stanford, CA
2012-2013	Postmaster's Researcher, Oak Ridge National Laboratory, Oak Ridge, TN
2009-2011	Graduate Research Assistant, North Carolina State University, Raleigh, NC

Publications

In review

Pisor, A., **Touma, D.**, Singh, D., & Jones, J.H., To understand climate change adaptation we must characterize climate variability. Here's how. *in second review in One Earth* (preprint: https://osf.io/r382h/)

Ficklin, D.L., **Touma., D.,** Cook, B.I., Wang, L., Robeson, S.M., Hwang, T., Scheff., J, Vegetation greening mitigates the impacts of increasing extreme rainfall on runoff events. *in first review in PNAS.*

Published

Touma, D. Hurrell, J.W., Tye, M., & Dagon, K., 2023, The impact of stratospheric aerosol injection on extreme fire weather risk, *Earth's Future,* 11, e2023EF003626. doi:10.1029/2023EF003626

Kalashnikov, D.A., Abatzoglou, J.T., Nauslar, N.J., Swain, D.L., **Touma, D.,** & Singh, D., 2022, Meteorological and geographical factors associated with dry lightning in central and northern California, *Environmental Research: Climate*, 1(2). doi: 10.1088/2752-5295/ac84a0

Touma, D., Stevenson, S., Swain, D.L., Singh, D., Kalashnikov, D.A., & Huang, X., 2022. Climate change increases the risk of extreme rainfall after wildfire in the western United States, *Science Advances, 8(13).* doi: 10.1126/sciadv.abm0320

Niu, Y., **Touma, D.,** Ting, M., Camargo, S.J., & Chen, R., 2022. Assessing heavy precipitation risk associated with tropical cyclones in China, *Journal of Applied Meteorology and Climatology*, 61 (5), 577-591. doi: 10.1175/JAMC-D-21-0166.1

Stevenson, S., Coats S., **Touma, D.,** Cole, J., Lehner, F., Fasullo, J., & Otto-Bliesner, B., 2022. 21st century hydroclimate: a new normal, with more frequent extremes, *Proc. Natl. Acad. Sci*., 119(12). doi: 10.1073/pnas.2108124119

Touma, D., Stevenson, S., Lehner, F. & Coats, S., 2021. Human-driven greenhouse gas and aerosol emissions cause distinct regional impacts on extreme fire weather, *Nature Communications, 12*(212). doi: 10.1038/s41467-020-20570-w

Rastogi, D., **Touma, D.**, Evans, K., & Ashfaq, M., 2020. Shift towards intense and widespread precipitation events over the United States by mid 21st century, *Geophys. Res. Lett.,* doi: 10.1029/2020GL089899

Swain, D.L., Singh, D., **Touma, D.,** & Diffenbaugh, N.S., 2020. Attributing extreme events to climate change: A new frontier in a warming world. *One Earth, 2*(6), doi: 10.1016/j.oneear.2020.05.011

Touma, D., Stevenson, S., Camargo, S.J., Horton, D.E. & Diffenbaugh, N.S., 2019. Variations in the intensity and spatial extent of tropical cyclone precipitation. *Geophys. Res. Lett.*, doi: 10.1029/2019GL083452.

Sarhadi, A., Ausín, M. C., Wiper, M. P., **Touma, D.** & Diffenbaugh, N. S., 2018. Multidimensional risk in a nonstationary climate: Joint probability of increasingly severe warm and dry conditions. *Science Advances*, *4*(11), doi: 10.1126/sciadv.aau3487

Touma, D., Michalak, A.M., Swain, D.L. & Diffenbaugh, N.S., 2018. Characterizing the spatial scales of extreme precipitation over the US in the recent past. *J. Clim*., 31, 8023–8037. doi:10.1175/JCLI-D-18-0019.1.

Diffenbaugh, N. S., Singh, D., Mankin, J. S., Horton, D. E., Swain, D. L. **Touma, D**., Charland, A., Liu, Y., Haugen, M., Tsiang, M. & Rajaratnam, B., 2017. Quantifying the influence of global warming on unprecedented extreme climate events. *Proc. Natl. Acad. Sci*., 114(19), 4881-4886. doi: 10.1073/pnas.1618082114

Ashfaq, M., Rastogi, D., Mei, R., Kao, S.-C., Gangrade, S., Naz, B.S. & **Touma, D.**, 2016. High-resolution ensemble projections of near-term regional climate over the continental United States *J. Geophys. Res. Atmos*. 121, 9943-9963. doi:10.1002/2016JD025285

Ashfaq, M., Rastogi, D., Mei, R., **Touma, D.** & Leung, L.R., 2016. Sources of errors in the simulation of south Asian summer monsoon in the CMIP5 GCMs, *Clim. Dyn.* doi:10.1007/s00382-016-3337-7

Alden, C. B., Miller, J. B., Gatti, L. V., Gloor, M. M., Guan, K., Michalak, A. M., van der Laan-Luijkx, I. T., **Touma, D**., Andrews, A., Basso, L. S., Correia, C. S. C., Domingues, L. G., Joiner, J., Krol, M. C., Lyapustin, A. I., Peters, W., Shiga, Y. P., Thoning, K., van der Velde, I. R., van Leeuwen, T. T., Yadav, V. & Diffenbaugh, N. S., 2016. Regional atmospheric CO2 inversion reveals seasonal and geographic differences in Amazon net biome exchange. *Glob Change Biol*. doi:10.1111/gcb.13305

Diffenbaugh, N.S., Swain, D.L. & **Touma, D**., 2015. Anthropogenic warming has increased drought risk in California. *Proc. Natl. Acad. Sci*. doi:10.1073/pnas.1422385112

Touma, D., Ashfaq, M., Nayak, M.A., Kao, S.-C., Diffenbaugh, N.S., 2015. A multi-model and multi-index evaluation of drought characteristics in the 21st century. *J. Hydrol.* doi:10.1016/j.jhydrol.2014.12.011

Ashfaq, M., Ghosh, S., Kao, S.-C., Bowling, L.C., Mote, P., **Touma, D**., Rauscher, S.A. & Diffenbaugh, N.S., 2013. Near-term acceleration of hydroclimatic change in the western U.S. *J. Geophys. Res. Atmos.* 118, 10,676–10,693. doi:10.1002/jgrd.50816

Grants

Awarded

2019-2022 NSF PREEVENTS, Track 2: Collaborative Research, "COEXIST: COnnected EXtremes In Space and Time" (Co-Investigator), PI: James Done, NCAR ($719,232)

2016-2017 National Socio-Environmental Synthesis Center (SESYNC) Graduate Pursuit project, "Data-driven drought effect estimation"

Invited Presentations

2023 American Geophysical Union Fall Meeting (upcoming)
2022 Atmospheric Science Colloquium, Colorado State University
2022 Meteorology Seminar, Florida State University
2022 Ocean and Climate Physics Seminar, Lamont-Doherty Earth Observatory
2022 Institute for Geophysics Seminar, University of Texas at Austin
2021 American Geophysical Union Fall Meeting
2021 Department of Physical Oceanography, Woods Hole Oceanographic Institution
2021 Science & Engineering Council of Santa Barbara
2021 NCAR Climate and Global Dynamics
2021 Earth Research Institute, UC Santa Barbara
2021 Department of Geography, University of Connecticut
2020 Stanford Atmosphere/Energy, Stanford University
2020 Risk KAN: Compound Events
2020 The Bren School of Environmental Science and Management, UC Santa Barbara
2020 Department of Environmental Sciences, University of Virginia

2019 Workshop on Risk Analysis for Extremes in the Earth System, Lawrence Berkeley Lab
2018 American Geophysical Union Fall Meeting
2018 Geophysical Fluid Dynamics Laboratory
2017 Climate Brown-Bag Seminar, Lawrence Berkeley Lab
2016 American Geophysical Union Fall Meeting

Selected Contributed Presentations

2023 WCRP Open Science Conference (oral and poster; upcoming)
2023 CESM Climate Variability and Change Working Group Meeting (oral)
2022 American Geophysical Union Fall Meeting (poster)
2022 CCIS Climate Intervention Scenario Design Workshop (oral)
2022 IAWF Fire and Climate Conference (oral)
2022 CESM Climate Variability and Change Working Group Meeting (oral)
2021 WCRP Workshop on Extremes in Climate Prediction Ensembles (ExCPEns) (oral)
2021 International Detection Attribution Group Seminar, virtual (oral)
2021 CESM Virtual Workshop, Fire Cross Working Group Session (poster)
2021 Workshop on Compound Weather and Climate Events, virtual (oral)
2020 American Geophysical Union Fall Meeting, virtual (oral)
2020 CESM Climate Variability and Change Working Group Workshop (oral)
2020 American Meteorological Society Annual Meeting, Boston, MA (oral)
2019 American Geophysical Union Fall Meeting, San Francisco, CA (oral)
2019 US CLIVAR Large Ensembles Workshop, Boulder, CO (poster)
2018 American Geophysical Union Fall Meeting, Washington, DC (oral)
2017 American Geophysical Union Fall Meeting, New Orleans, LA (oral)
2016 Graduate Climate Conference, Forest Pack, WA (poster)
2016 School of Earth, Energy and Environmental Sciences Review, Stanford, CA (poster)
2016 Severe Convection and Climate Workshop, Columbia University, New York, NY (poster)
2015 American Geophysical Union Fall Meeting, San Francisco, CA (poster)
2014 Fourth Workshop on Understanding Climate Change from Data, Boulder, CO (poster)
2014 American Geophysical Union Fall Meeting, San Francisco, CA (poster)
2013 American Geophysical Union Fall Meeting, San Francisco, CA (poster)
2013 European Geosciences Union General Assembly, Vienna, Austria (oral)

Selected Research Coverage in Media

2022 "UCSB Scientists See the End of 'Normal' Climate", *Santa Barbara Independent*; "Fires, Then Floods: Risk of Deadly Climate Combination Rises", *New York Times*; "Fire and rain: West to get more one-two extreme climate hits", *Associated Press*; "Double Disaster: Wildfires Followed by Extreme Rainfall Are More Likely with Climate Change", *Scientific American*; "'A year after year disaster:' The American West could face a 'brutal' century under climate change", *USA Today*; "Climate change raises risk of destructive combination of fire and floods: study", *CBC News: The National*; "Studies show increase in flood and wildfires in Colorado", *9News (KUSA)*

2021 "Extreme Fire Weather", *The Current (UCSB)*

2020 "In the eastern U.S., tropical storms that were once major hurricanes pose greatest threat of extreme rain", *Climate.gov (NOAA)*

2019 "Wind and Water", *The Current (UCSB)*; "Damaging Rains from Hurricanes Can Be More Intense after Winds Subside", *State of the Planet (Columbia University)*

Science Communication

2023 Expert Guidance, Canadian Forest Fire Weather Index (FWI), *NCAR Climate Data Guide*
2023 Expert Guidance, CHIRPS: Climate Hazards InfraRed Precipitation with Station data, *NCAR Climate Data Guide*
2020-2023 Science Contributor: "Extreme Wildfires Make Their Own Weather", *AGU EOS;* "Western wildfires are making far away storms more dangerous", *NPR*; "The drought in the western U.S.

could last until 2030", *National Geographic;* "Melting Arctic sea ice linked to 'worsening fire hazards' in western US", *CarbonBrief* ; "As 'mudslides on steroids' threaten, Santa Cruz Mountain dwellers ponder new normal", *Lookout Santa Cruz*

2022 Panelist, Understanding Climate Change Through the Science of Water: Hydrology and Climatology, AARP-California & WELL Virtual Water Symposium

2021 Panelist, State on Fire: Exploring Links Between California's Fires and Climate Change, Washington, D.C. Columbia Alumni Association.

2020 Podcast Guest, *Ocean Solutions: a NOISE Lab podcast*

2019 Panelist, Amazon and California Fires Media Availability, AGU Fall Meeting

Leadership and Service

2021- Guest Editor, RMetS Atmospheric Science Letters, Special Issue: Novel data science approaches to evaluate weather and climate extremes

2022-2023 NCAR ASP Lecture Series Committee & Professional Development Committee

2022-2023 Primary session convener, AGU Fall Meeting

2021 Session co-convener, AGU Fall Meeting

2019-2022 Judge and Session Liaison, Outstanding Student Poster Award, AGU Fall Meeting

2020 Session co-convener, American Meteorological Society (AMS) Annual Meeting

2016-2017 Faculty Search Committee Student Representative, Atmospheric Dynamics Faculty Search, Department of Earth System Science, Stanford University

2015-2016 Rising Environmental Leaders Program, Stanford Woods Institute for the Environment

2014-2016 Graduate Student Advisory Committee, School of Earth, Energy and Environmental Sciences, Stanford University

2014-2021 K-12 Educator on Science and Climate Change, Multiple locations and programs in California

Teaching and Mentoring

2022 Guest Lecturer, Colorado College, Colorado Springs, CO
Course: *Atmospheric Dynamics*

2020 Guest Lecturer (virtual), Indiana University, Bloomington, IN
Course: *Current and Future Trends in Extreme Weather*

2020 Research Mentor for two Master's students, University of California, Santa Barbara

2019-2020 Mentor, Women in STEM Mentorship Program, University of California, Santa Barbara

2016-2018 Graduate Student Mentor, Enhancing Diversity in Graduate Education (EDGE) Doctoral Fellowship Program, Stanford University

2014-2017 Graduate Teaching Assistant, Stanford University
Courses: *The Global Warming Paradox, Climate and Society*

2007-2011 Undergraduate and Graduate Teaching Assistant, North Carolina State University
Courses: *Civil Engineering Systems, Civil Engineering Computing, Mechanics of Solids, Engineering Economics*

Awards

2021 AGU Editors' Citation for Excellence in Refereeing

2017 Outstanding Student Paper Award, AGU Fall Meeting

2017 Certificate of Achievement in Mentoring, Stanford University

Peer Review

Journals: Nature, Nature Climate Change, Nature Communications, Nature Food, Geophysical Research Letters, Journal of Climate, Science Advances, Earth's Future, Journal of Geophysical Research – Atmospheres, Climate Dynamics, Journal of Applied Meteorology and Climatology, Journal of Hydrology, Environmental Research Letters, Journal of Hydrometeorology, Water Resources Research, Scientific Reports, npj Climate and Atmospheric Science, International Journal of Climatology

Grant proposals: NSF CAREER, NASA ROSES (panel reviewer), French National Research Agency, NOAA MAPP (panel reviewer)