

Daniel L. Swain

Assistant Research Scientist, Institute of the Environment & Sustainability
University of California, Los Angeles, CA

Research Fellow, Capacity Center for Climate and Weather Extremes
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The Nature Conservancy of California, Sacramento, CA

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Research interests

Dynamics & impacts of regional climate change, hydroclimate extremes, wildfires & climate, extreme event detection/attribution, natural hazard risk, climate adaptation, science writing & communication

Education

- Ph.D., Earth System Science, Stanford University** 2016
Dissertation: “Character and causes of changing North Pacific climate extremes”
Advisor: Dr. Noah Diffenbaugh
- B.S., Atmospheric Science, University of California, Davis (Highest Honors)** 2011

Selected honors and awards

- Vice Magazine “Human of the Year” 2020
- National Academy of Sciences Kavli Fellow 2019
- Finalist, AAAS Early Career Award for Public Engagement with Science 2018
- NatureNet Postdoctoral Fellowship, Nature Conservancy/University of California 2016-2018
- ARCS Fellowship, Achievement Rewards for College Scientists Foundation 2015-2016
- Switzer Environmental Fellowship, Robert and Patricia Switzer Foundation 2015-2016
- Graduate Student Award for Scholarly & Research Achievement, Stanford University 2015
- Fellow, Rising Environmental Leaders Program, Stanford Woods Inst. for the Environment 2013
- Centennial Teaching Assistant Award, School of Earth Sciences, Stanford University 2013
- College Medal, College of Agricultural & Environmental Sciences, Univ. of California, Davis 2011
- Departmental Citation, Atmospheric Science, University of California, Davis 2011
- Regents Scholarship, University of California, Davis 2009-2011
- American Meteorological Society Undergraduate Scholar 2007-2009
- NASA Ames/AIAA Galileo Memorial Scholarship 2007

Grants

- Principal Investigator, California Department of Water Resources Grant: “Developing plausible extreme storm and flood scenarios for disaster resilience planning and emergency” 2021-2023

response exercises in California,” **Award total: \$140,000**

Co-Principal Investigator, National Science Foundation Prediction of and Resilience against Extreme Events (NSF PREEVENTS) Program, Track 2: “COEXIST: COnnected EXtremes In Space and Time,” Award ID: 1854761, **Award total: \$345,446** (UCLA portion) 2019-2023

Principal Investigator, Yuba Water Agency grant: “Developing California Megastorm Scenarios for ARkStorm 2.0,” **Award total: \$60,000** 2021-2022

Publications

34. Gonzales, K.R., **Swain, D.L.**, Roop, H.A., and N.S. Diffenbaugh. Quantifying the Relationship Between Atmospheric River Origin Conditions and Landfall Temperature. *Geophysical Research Letters*, 127, e2022JD037284, doi: 10.1029/2022JD037284, 2022. 2022
33. ****Huang, X.Y.** and ****D.L. Swain.** Climate change is increasing the risk of a California Megaflood. *Science Advances*, 8, 32, doi: 10.1126/sciadv.abq0995, 2022. 2022
(Equal Contributions / Co-first authors)
32. Kalashnikov, D.A., Abatzoglou, J.T., Nauslar, N.J., **Swain, D.L.**, Touma, D., & D. Singh. Meteorological factors and elevation dependence of dry lightning in central and northern California. *Environmental Research: Climate*, 1, 025001, doi: 10.1088/2752-5295/ac84a0, 2022. 2022
31. Touma, D., Stevenson, S., **Swain, D.L.**, Singh, D., Kalashnikov, D., and X.Y. Huang. Climate change increases risk of extreme rainfall following wildfire in the western United States. *Science Advances*, 8, eabm0320, doi: 10.1126/sciadv.abm0320, 2022. 2022
30. Fish, M.A., Done, J., **Swain, D.L.**, Wilson, A.M., Michaelis, A.C., Gibson, P.B., and F. Martin Ralph. Large-scale environments of successive atmospheric river events leading to compound precipitation extremes in California. *Journal of Climate*, 35, 1515–1536, doi: 10.1175/JCLI-D-21-0168.1, 2022. 2022
29. Kalashnikov, D., Schnell, J.L., Abatzoglou, J.T., **Swain, D.L.** and D. Singh. Increasing co-occurrence of fine particulate matter and ground-level ozone extremes in the western United States. *Science Advances*, 8, eabi9386, doi: 10.1126/sciadv.abi9386, 2022. 2022
28. Brunner, M.I., **Swain, D.L.**, Wood, R.R., Willkofer, F., Done, J.M., Gilleland, E., and R. Ludwig. An extremeness threshold determines the regional response of floods to changes in rainfall extremes. *Communications Earth and Environment*, 2, doi: 10.1038/s43247-021-00248-x, 2021. 2021
27. Goldenson, N., Thackeray, C.W., Hall, A., **Swain, D.L.**, and N. Berg. Using large ensembles to identify regions of systematic biases in moderate to heavy daily precipitation. *Geophysical Research Letters*, 48, e2020GL092026, doi: 10.1029/2020GL092026, 2021. 2021
26. †**Swain, D.L.** A shorter, sharper rainy season amplifies California wildfire risk. *Geophysical Research Letters*, 48, e2021GL092843, doi: 10.1029/2021GL092843, 2021. 2021
25. Brunner, M.I., **Swain, D.L.**, Gilleland, E., and A. Wood. Increasing importance of temperature as a driver of streamflow drought spatial extent. *Environmental Research Letters*, 16, 024038, doi: 10.1088/1748-9326/abd2f0, 2021. 2021
24. Gonzales, K.R., **Swain, D.L.**, Barnes, E.A., and N.S. Diffenbaugh. Moisture vs. Wind- 2020

Dominated Flavors of Atmospheric Rivers. *Geophysical Research Letters*, 47, e2020GL090042, doi: 10.1029/2020GL090042, 2020.

23. Swain, D.L., Wing, O.E.J., Bates, P.D., Done, J.M., Johnson, K.A., and D.R. Cameron. 2020
Increased flood exposure due to climate change and population growth in the United States. *Earth's Future*, 8, e2020EF001777, doi: 10.1029/2020EF001778, 2020.

22. Persad, G.G., Swain, D.L., Kouba, C., and J.P.O. Partida. 2020
Projected Shifts in California Hydroclimate Characteristics Critical to Water Management. *Climatic Change*, 162, 1493–1513, doi: 10.1007/s10584-020-02882-4, 2020.

21. Abatzoglou, J., Smith, C., Swain, D.L., Ptak, T., and C. Kolden. 2020
Population exposure to pre-emptive de-energization aimed at averting wildfires in Northern California. *Environmental Research Letters*, 15, 094046, doi: 10.1088/1748-9326/aba135, 2020.

20. *Goss, M., Swain, D.L., Sarhadi, A., Kolden, C.A., Abatzoglou, J.T., Williams, A.P., and N.S. Diffenbaugh. 2020
Climate change is increasing the risk of extreme autumn wildfire conditions across California. *Environmental Research Letters*, 15 (9), 094016, doi: 10.1088/1748-9326/ab83a7, 2020.

[Named “Best Article of 2020” by *Environmental Research Letters* Editorial Board]

19. Huang, X., Swain, D.L., and A. Hall. 2020
Large ensemble downscaling of extreme atmospheric River storms in California reveals large increase in fine-scale precipitation. *Science Advances*, 6, eaba1323, doi: 10.1126/sciadv.aba1323, 2020.

18. Brunner, M.I., Gilleland, E., Wood, A., Swain, D.L., and M. Clark. 2020
Spatial dependence of floods shaped by spatiotemporal variations in meteorological and land-surface processes. *Geophysical Research Letters*, 47, e2020GL088000, doi: 10.1029/2020GL088000, 2020.

17. †Swain, D.L., Singh, D., Touma, D., and N.S. Diffenbaugh. 2020
Attributing extreme events to climate change: A new frontier in a warming world. *One Earth*, 2, 522-527, doi: 10.1016/j.oneear.2020.05.011, 2020.

16. Huang, X., Swain, D.L., Walton, D.B., Berg, N., Stevenson, S., and A. Hall, Simulating and Evaluating Atmospheric River-Induced Precipitation Extremes along the U.S. Pacific Coast: Case Studies from 1980-2017. *Journal of Geophysical Research: Atmospheres*, 125, e2019JD031554, doi: 10.1029/2019JD031554, 2020.

15. Gibson, P.B., Waliser, D.E., Guan, B., DeFlorio, M.J., and D.L. Swain. 2020
Ridging associated with drought in western and southwestern United States: characteristics, trends and predictability. *Journal of Climate*, 33, 2485-2408, doi: 10.1175/JCLI-D-19-0439.1, 2020.

14. Gonzales, K.R., Swain, D.L., Barnes, E.A., K. Nardi, and N.S. Diffenbaugh. 2019
Recent warming of landfalling atmospheric rivers along the West Coast of the United States. *Journal of Geophysical Research: Atmospheres*, 124, 6810-6826, doi: 10.1029/2018JD029860, 2019.

13. †Swain, D.L., 2019. Is society ready for precipitation whiplash?, In: “Toward a Resilient Global Society: Air, Sea Level, Earthquakes, and Weather.” *Earth's Future*, 7, 854-864, doi: 10.1029/2019EF001242, 2019.

12. Thackeray, C.W., A.M. DeAngelis, A. Hall, D.L. Swain, and X. Qu. 2018
On the Connection Between Global Hydrologic Sensitivity and Regional Wet Extremes. *Geophysical Research Letters*, 45, doi: 10.1029/2018GL079698, 2018.

11. Touma, D., A. M. Michalak, **D.L. Swain**, and N.S. Diffenbaugh. Characterizing the spatial characteristics of extreme precipitation over the United States. *Journal of Climate*, 31, 8023-8037, doi: 10.1175/JCLI-D-18-0019.1, 2018.
10. ***Swain, D.L.**, B. Langenbrunner, J.D. Neelin, and A. Hall. Increasing precipitation volatility in twenty-first-century California. *Nature Climate Change*, 8, 427-433, doi: 10.1038/s41558-018-0140-y., 2018.
9. **Swain, D.L.**, D. Singh, D.E. Horton, J.S. Mankin, T. Ballard, and N.S. Diffenbaugh. Remote linkages to anomalous winter atmospheric ridging over the northeastern Pacific. *Journal of Geophysical Research: Atmospheres*, 122, 12,194-12,209, doi: 10.1002/2017JD026575, 2017.
8. *Diffenbaugh, N.S., Singh, D., Mankin, J.S., Charland, A., Horton, D.E., Haugen, M., **Swain, D.L.**, Rajaratnam, B., and Touma, D. Quantifying the influence of global warming on unprecedented extreme climate events. *Proceedings of the National Academy of Sciences*, 114, 4881-4886, doi: 10.1073/pnas.1618082114, 2017.
7. Singh, D., **D. L. Swain**, J.S. Mankin, D.E. Horton, L.N. Thomas, B. Rajaratnam, and N.S. Diffenbaugh. Recent amplification of the North American winter temperature dipole. *Journal of Geophysical Research: Atmospheres*, 121, 9911-9928, doi: 10.1002/2016JD025116, 2016.
6. **Swain, D. L.**, Horton, D.E., Singh, D., and N.S. Diffenbaugh. Trends in atmospheric patterns conducive to seasonal precipitation and temperature extremes in California. *Science Advances*, 2, e1501344, doi: 10.1126/sciadv.1501344, 2016.
5. **Swain, D.L.**, Lebassi-Habtezion, B., and N.S. Diffenbaugh. Evaluation of non-hydrostatic simulations of Northeast Pacific atmospheric rivers and comparison to in-situ observation. *Monthly Weather Review*, 143, 3556-3569, doi: 10.1175/MWR-D-15-0079.1, 2015.
4. *Horton, D.E., N.C. Johnson, D. Singh, **D.L. Swain**, B. Rajaratnam and N.S. Diffenbaugh. Contribution of changes in atmospheric circulation patterns to extreme temperature trends. *Nature*, 522, 465-469, doi: 10.1038/nature14550, 2015.
3. *Diffenbaugh, N.S., **D.L. Swain** and D. Touma. Anthropogenic warming has increased drought risk in California. 112, 3931-3936, *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1422385112, 2015.
2. †**Swain, D.L.** A tale of two California droughts: Lessons amidst record warmth and dryness in a region of complex physical and human geography. *Geophysical Research Letters*, doi:10.1002/2015GL066628, 2015.
1. ***Swain, D.L.**, M. Tsiang, M. Haugen, D. Singh, A. Charland, B. Rajaratnam and N.S. Diffenbaugh. The extraordinary California drought of 2013-2014: character, context, and the role of climate change [in "Explaining Extremes of 2013 from a Climate Perspective"]. *Bulletin of the American Meteorological Society*, 95 (9), S3-S7, 2014.

* = ISI Highly Cited Paper

** = Equal contributions/co-first authorship

† = Perspective, commentary, or subject matter primer

Publications in progress

Published reports

- Persad, G.G., Partida, J.P.O., and **Swain, D.L.**, “Troubled Waters: Preparing for Climate Threats to California’s Water System,” *Union of Concerned Scientists*, 2020. 2020
- Mount, J., **Swain, D.L.**, and P. Ullrich, “Just the Facts: Climate Change and California’s Water,” *Public Policy Institute of California*, 2019. 2019
- Hanak, E. et al., “California’s Water,” *Public Policy Institute of California*, 2018. 2018
- Mount, J. et al., “Managing Drought in a Changing Climate: Four Essential Reforms,” *Public Policy Institute of California*, 2018. 2018

Professional experience

Scientific research appointments

- Climate Scientist (Assistant Research Scientist)** 2018-Present
Inst. of Environment & Sustainability, University of California, Los Angeles
 Lead research on dynamics & impacts of regional climate change and serve as primary media point of contact on weather/climate-related topics.
- California Climate Fellow** 2018-Present
The Nature Conservancy
 Lead interdisciplinary research aimed at understanding of dynamics of future climate changes (including extreme events) and implications for human infrastructure and ecosystems; evaluate risk-reduction interventions & co-benefits to society & natural systems.
- Research Fellow** 2018-Present
Capacity Center for Weather & Climate Extremes, Nat. Center for Atmospheric Res.
 Lead research into atmospheric/Earth system dynamics of hydrologic cycle extremes.
- Postdoctoral Fellow** 2016-2018
Inst. of Environment & Sustainability, University of California, Los Angeles
 Investigate the character and causes of changes in hydrological cycle extremes in California.
- Graduate Research Assistant** 2011-2016
Climate and Earth System Dynamics Group, Stanford University
 Develop and conduct scientific investigations of climate variability and change in the North Pacific/western North America region, with a focus on extreme meteorological events and persistent circulation patterns.
- Intern** 2010
NASA/National Center for Suborbital Research, University of California, Irvine
 Obtain “ground truth” measurements for comparison to NASA overflights with hyperspectral imager as part of agricultural evapotranspiration study.

Teaching

- Teaching Assistant, Department of Earth System Science, Stanford University** 2013

Course: “Atmosphere, Ocean & Climate Dynamics: The Atmospheric Circulation.” Give guest lectures, develop and implement practical laboratory sessions, hold office hours, and evaluate student performance.

Invited Guest Lecturer

University of California, Los Angeles

2016-2020

Courses: Advanced Topics in Environment and Sustainability; Climate Law and Policy; The Blue Planet: Introduction to Oceanography

Stanford University

2013-2016

Courses: Atmosphere, Ocean & Climate Dynamics I & II; Stanford Pre-Collegiate Institutes

Academic Advisees

Dr. Jennifer Bukowski, Postdoctoral Researcher, Inst. Of Environ. & Sustainability, UCLA

2021-2023

Science communication and science writing

Author & founder, Weather West blog (www.weatherwest.com)

2006-Present

Write regular articles focusing on a wide range of California/western North America weather and climate topics; answer questions from public, decision-makers, and scientists regarding meteorology/climatology/general science/science policy. Strong emphasis on making scientific and technical topics accessible to a broad audience (>1 million visitors each year).

Climate science engagement via social media

2014-Present

Weather, climate, Earth science, and public policy discussion and outreach via Twitter as @Weather_West (>10 million views each year). Direct engagement with public, scientists, wildland firefighters, water managers, local & regional government, and policymakers

Atmospheric and climate science media liaison

2013-present

Frequent, sustained engagement with local, national, and international news media on weather & climate-related issues. ~150 interviews each year with a wide range of outlets:

Newspaper: New York Times, Washington Post, USA Today, Wall Street Journal, Bloomberg, Los Angeles Times, San Francisco Chronicle, Sacramento Bee & countless local papers

Long-form/magazine: Time, The Economist, Newsweek, The Atlantic, Wired, Scientific American, Popular Science, National Geographic, Rolling Stone, Vogue, Outside Magazine, Sunset Magazine, Bay Nature Magazine, Mother Jones, among many others

Radio: NPR/Science Friday (and numerous local affiliates), BBC World Service, ABC & CBS national radio (and local affiliates), numerous local stations

Television: CNN, ABC, NBC, PBS, BBC, CBC, Al Jazeera, HBO, American, German, French, British, & Danish public television, Democracy Now, numerous documentaries, numerous local news affiliates

Web outlets: Vox, Slate Magazine, Vice Magazine, BuzzFeed, Mashable, The Verge

Climate/weather-focused: The Weather Channel, Climate Central, Climate Nexus, InsideClimate News, Wunderground, The Weather Network, Fox Weather

Podcasts: American Adapts (Doug Parsons), Science+Story (Bob Lalasz), Factually (Adam Conover), Water Talk, The Flakes (OpenSnow), Growing the Valley (UC Extension), TBD (Slate Magazine), Nova (PBS), Climate Crisis (Yahoo News), What Is California? (Stu VanAirdale), Abwaan Chronicles, Fifth and Mission (SF

Chronicle), The Lookout (Zeke Lunder), Capital Considerations (Wilmington Trust), The Civil Engineering Podcast, In the Bubble (Andy Slavitt), Against the Odds (Wonderly)

Science writing for broad audiences

Occasional contributor of invited popular science/current event-related perspective pieces in print and online media, including selected publications below. 2010-present

Swain, D.L. “Extreme Weather and Climate,” Page-A-Day calendar, Workman Publishing (in press) Jan. 2023

Swain, D.L. “The Deadly Dynamics of Colorado’s Marshall Fire,” *Outside Magazine*, 11 January 2022. Jan. 2022

Swain, D.L., Kolden, C., and J. Abatzoglou, “The era of megafires: the crisis facing California and what will happen next,” perspective in *The Guardian*, 08 August 2018. Aug. 2018

Swain, D.L., *Outside Magazine* & KQED Public Media contributor, various articles 2015-2016

Public policy engagement

Member, Scientific Advisory Committee for the Delta Stewardship Council’s Delta Science Program 2021-present

Member, Public Policy Institute of California Water Policy Research Network 2018-present

Invited Panelist, California Governor’s Office of Planning and Research (OPR) Roundtable On Water Management and California's 5th Climate Change Assessment Sep. 2022

Invited Expert, science briefing on extreme heat and climate change, office staff of U.S. Senator Alex Padilla Sep. 2022

Invited Panelist, California Senate Democratic Caucus panel on climate change Mar. 2022

Invited Panelist, Climate Change Town Hall meeting hosted by California State Senator Mike McGuire Oct. 2021

Invited Expert, science briefing on extreme atmospheric rivers, climate change, and flood risk in California, United States Representative Terrance John Cox Jul. 2020

Invited Expert, science briefing on weather extremes and climate change, United States Senator Sheldon Whitehouse Oct. 2019

Broader community engagement

Climate Feedback expert reviewer, assessing national/international media coverage on climate change and extreme weather as member of accredited fact-checking organization Sep. 2016-present

Invited Keynote Speaker, “Extreme weather in a warming climate,” Steamboat Weather Summit, Steamboat Springs, CO Jan. 2023

Invited Speaker, “ARkStorm 2.0: A new and improved extreme storm and flood scenario for California in the climate change era,” Federal Emergency Management Agency (FEMA) Region 9 Briefing*	Oct. 2022
Invited Speaker, “In a warming climate, California flood risk looms large despite long-term aridification and worsening drought,” California Department of Water Resources “Drought to Flood” Climate Change Symposium, Sacramento, CA*	Oct. 2022
Invited Community Speaker, “California weather in the climate change era: A tale of increasing hydroclimate whiplash,” Chan Zuckerberg Biohub Community Speaker Series, San Francisco, CA	Sep. 2022
Invited Speaker, “California Weather, Climate & Its Extremes,” Sustainable Silicon Valley Water & Sustainable Life (WET) Talk*	July 2022
Invited Panelist, West Coast Climate Crisis Symposium, University of California, Los Angeles*	June 2022
Invited Speaker, “California Wildfire in the Climate Change Era,” Marin Wildfire Prevention Authority*	May 2022
Invited Speaker, “Drought, flood, and precipitation whiplash in a warming California,” The Metropolitan Water District of Southern California Water Dialogue*	Mar. 2022
Invited Panelist, “California Dystopia: Understanding Climate Change and Social Collapse through Science Fiction,” USC Visions and Voices: The Arts and Humanities Initiative, University of Southern California, Los Angeles, CA	Mar. 2022
Invited Speaker and Panelist, “Hanging Ourselves Out to Dry or The Beginning of a New Beginning?” California Foundation on the Environment and the Economy Conference on California Water*	Dec. 2021
Invited Speaker, California Water Action Collaboration Risk Discussion Session*	Dec. 2021
Invited Keynote Speaker, “California water in an era of increasing climate complexity,” California Water Policy Conference*	Nov. 2021
Invited Speaker and Panelist, “Climate extremes and prediction in a warming California,” Drought and Climate Forecasting Panel, California Legislative Staff Education Institute Virtual Meeting*	Nov. 2021
Invited Panelist, “Making our water infrastructure climate-ready,” California Water Policy Conference, Public Policy Institute of California*	Nov. 2021
Invited Speaker and Panelist, “Climate extremes in a warming California,” California Climate Safe Policy Summit*	Aug. 2021
Invited Speaker, “Warmer and wilder: Increasing water resource variability in a changing	Jun. 2021

California,” California Water Efficiency Partnership Annual Conference*

Invited Plenary Speaker, “Hotter, drier, and longer: Shifting seasonality and fire season in California,” The Nature Conservancy of California Leadership Meeting* Jun. 2021

Invited Speaker, “Wildfire, flood, and drought risk in a warming California,” Bay Area Climate Adaptation Network Meeting* May 2021

Invited Speaker, “Climate change in California: A drier or wetter future—or...both?” 2021 Thelma Hansen Virtual Symposium, University of California Cooperative Extension* Apr. 2021

Invited Speaker, “Climate Change Issues Affecting Water Supply, Storage and Flood Control, and Endangered Species,” California Water Law and Policy Conference 2021* Apr. 2021

Invited Speaker, “Increasing hydroclimate whiplash in California: Challenges (and opportunities) for wildfire and flood management,” ARCS Foundation webinar* Apr. 2021

Invited Speaker, “Climate Change and Extreme Events in California,” Northern California Science Writers Association virtual meeting* Mar. 2021

Invited Panelist, “Climate change in California and Nevada: Challenges and opportunities in an era of increasing variability,” Operation Sierra Storm Broadcast Meteorology Virtual Conference* Jan. 2021

Invited Panelist, “A Meteorologist, a Seismologist, a Volcanologist, and a Decision-maker Walk into a Bar: Improving our own risk and impact communication by examining experiences from outside the weather, water, and climate enterprise,” American Meteorological Society Annual Virtual Meeting* Jan. 2021

Invited Keynote Speaker, “Water woes in a warming California: Management challenges and opportunities in an era of increasing variability,” Association of California Water Agencies (ACWA) Virtual Fall Meeting* Dec. 2020

Invited Speaker, “Fanning the Flames: The Reality of Climate Change and Wildfires in California,” Nature Conservancy of California Webinar* Nov. 2020

Invited Keynote Speaker, “Climate Change in California: A Tale of Shifting Baselines, Sharpening Seasonality, and Increasing Precipitation Whiplash,” Interagency Ecological Program Annual Workshop, Folsom, CA* Oct. 2020

Invited Panelist, “Early Career Leadership Academy Panel,” American Meteorological Society* Oct. 2020

Invited Speaker, “Climate Change in California: Wetter wets, drier dries, and shifting seasonality,” San Bernardino Valley Municipal Water District Board Engineering Workshop* Aug. 2020

Invited Panelist, “The Future of Wildfire, Climate Change, and Water in the West,” California Grantmakers Association* July 2020

Invited Speaker, “Role of the scientist-communicator in an era of social media and climate change,” The Nature Conservancy of California Webinar * Mar. 2020

Invited Speaker, “Climate change in California: A tale of fire and flood,” Water Education Foundation “Water Leaders” Orientation, Sacramento, CA* Jan. 2020

Invited Speaker, "Wetter, drier, or both? Increasing hydroclimatic variability in 21 st century California," University of California Agriculture & Natural Resources Water Strategic Initiative meeting, Davis, CA*	May 2019
Invited Speaker, "Is California ready for increasing precipitation whiplash?," American River Operations Work Group meeting, Folsom, CA*	May 2019
Invited Speaker, "Forces of Nature: H2-Uh-Oh," First Fridays event at Natural History Museum of Los Angeles, Los Angeles, CA	May 2019
Invited Speaker, "The Wild West of Online Science Communication," University of Washington Program on Climate Change, Seattle, WA*	Apr. 2019
Invited Panelist, "LA's New Abnormal: Megafires," UCLA Institute of the Environment and Sustainability & The Nature Conservancy, Los Angeles, CA	Feb. 2019
Invited Speaker, "Fire & Water from the 30,000-Foot Level," Water Education Foundation "Water Leaders" Orientation, Sacramento, CA*	Jan. 2019
Invited Keynote Speaker, "Drought, flood, and wildfire amidst increasing climate whiplash: the challenging road ahead for water management in the West," Water Education Foundation Water Summit, Sacramento, CA	Sep. 2018
Invited Interactive Speaker, "Climate Change Cliff Notes," A Climate Series for the Ages, hosted by UCLA Institute of Environment and Sustainability & Natural History Museum of Los Angeles, Los Angeles, CA	Oct. 2017
Invited Speaker, "Change in a land of extremes: what we know (and don't know) about California's climate future," Krotana Institute/Ojai Valley Conservancy, Ojai, California	May 2017
Featured Speaker, Stanford Connects 2016: "The Rise of the Ridiculously Resilient Ridge and the Future of California Drought," Stanford University, Stanford, CA	May 2016
Project Mentor, Stanford University course: "International Climate Negotiations (COP 21)"	Dec. 2015
Invited Speaker, "Flood in a time of drought? Effects of a powerful El Niño in the midst of California's record dry spell," Association of Bay Area Governments, Oakland, CA	Sep. 2015
Invited Speaker, "Climate Change in a Land of Extremes: Drought and Flood in California's Past, Present, and Future," U.S. National Park Service Parsons Memorial Lodge Lecture Series, Yosemite National Park, CA	Aug. 2015
Invited Speaker and Panelist, "California Drought Panel," Water in the West/Woods Institute for the Environment, Stanford University, Stanford, CA	Mar. 2015
Invited Panelist, "Earth Matters/A Matter of Degrees," Stanford Continuing Studies Program, Stanford University, Stanford, CA	Feb. 2015
Invited Science Speaker, "Stanford to the Sea" Science Hike, "The Ridiculously Resilient Ridge in Context: Climate Variability of California's Past, Present, and Future," Bill Lane Center for the American West, Stanford University, Stanford, CA	May 2014
Invited Speaker and Panelist, "Current Drought: Causes, how bad is it, and will we see more?"	Apr. 2014

University of California Drought Summit, California State Capitol, Sacramento, CA

Invited Speaker and Panelist, "The California Drought: Causes, Context, and Response," Bill Lane Center for the American West/Woods Institute for the Environment, Stanford University, Stanford, CA Feb. 2014

Founder and leader, Aggie Forecasting Team at University of California, Davis 2008-2011

Co-leader, Atmospheric Profiling & Stratospheric Photography Project, Univ. of Calif., Davis 2009-2011

*Denotes remote participation via teleconference

Invited scientific presentations

"Understanding extremes in a warming climate: On acknowledging uncertainty, embracing complexity, and asking societally relevant questions," *American Physical Society Annual Meeting*, Chicago, IL* (*invited speaker*) Mar. 2022

"Rising California flood risk from stronger, wetter atmospheric rivers in a warming climate," *California Extreme Precipitation Symposium*, University of California, Davis* (*invited speaker*) June 2021

"A worsening wildfire crisis in California and the broader West: The role of climate change," Cat Risk Management 2021 Conference, Reinsurance Association of America* (*invited speaker*) Mar. 2021

"Sharpening seasonality and shifting hydrology: implications for wildfire and flood risk in a warming California," *Geological and Planetary Sciences Division Seminar*, California Institute of Technology, Pasadena, CA* (*invited speaker*) Mar. 2021

"Climate communication in the Twitter era: Challenges, opportunities, and some personal Reflection," *American Geophysical Union Fall Meeting*, San Francisco, CA* (*invited speaker*) Dec. 2020

"Regional downscaling of large ensemble simulations as a tool for understanding changing hydroclimatic extremes in a warming climate," *CLIVAR Large Ensembles Workshop*, Boulder, CO (*invited speaker*) Jul. 2019

"Hydroclimatic intensification in a warming world: is society ready for increasing precipitation whiplash?" *American Geophysical Union Fall Meeting*, Washington, D.C. (*invited speaker*) Dec. 2018

"Thinking about climate risk in an era of extremes: California's increasingly wide swings between drought and flood," *Department of Geography Seminar*, University of California, Berkeley (*invited lecturer*) Oct. 2018

"Atmospheric rivers as a scientific (and conversational) bridge between weather and climate," *International Atmospheric Rivers Conference*, Scripps Institute of Oceanography, La Jolla, CA (*invited speaker*) Jun. 2018

"California's increasingly extreme climate future," Rusch Honors Colloquium, Viterbi School of Engineering, Univ. of Southern California, Los Angeles, CA (*invited lecturer*) Nov. 2017

"Causes and impacts of climate change—a California perspective," Climate and Law Policy Seminar, UCLA School of Law, Los Angeles, CA (*invited lecturer*) Sep. 2017

“Teleconnections and regional impacts under anthropogenic forcing” & “Global warming influence on extreme events,” <i>US Climate Variability and Predictability Program (CLIVAR) Summit</i> , Baltimore, MD (<i>invited speaker and panelist</i>)	Aug. 2017
“Trends in persistent seasonal-scale atmospheric circulation patterns responsible for precipitation and temperatures extremes in California,” <i>American Geophysical Union Fall Meeting</i> , San Francisco, CA (<i>invited speaker</i>)	Dec. 2015
“Drought causes,” <i>American Geophysical Union Chapman Conf. on California Drought: Causes, Impacts, & Policy</i> , Univ. of California, Irvine (<i>invited panelist</i>)	Apr. 2015
“The extraordinary 2012-2015 drought in California and its context in a warming world,” <i>Water Scarcity in the West: Past, Present, Future Conference</i> , Univ. of California, Davis (<i>invited speaker and panelist</i>)	Apr. 2015
“Persistent atmospheric patterns and the ongoing California drought: the role of the Ridiculously Resilient Ridge,” <i>NASA Earth Science Seminar</i> , NASA Ames, Mountain View, CA (<i>invited speaker</i>)	Mar. 2015
“The extraordinary California drought of 2012-2015: Historical context and the role of climate change,” <i>PACCLIM Pacific Climate Workshop 2015</i> , Pacific Grove, CA (<i>invited speaker</i>)	Mar. 2015
“The extraordinary California drought of 2012-2015: Historical context and the role of climate change,” <i>Atmosphere and Energy Departmental Seminar</i> , Stanford University, Stanford, CA (<i>invited speaker</i>)	Mar. 2015

Other awards and recognitions

“Most Important Changemaker in the West,” <i>Deseret Magazine</i>	2022
<i>Environmental Research Letters</i> Editorial Board “Best Article of 2020” (Goss et al. 2020)	2021
“Must Follow” Social Media Meteorologist/Climatologist, <i>Forbes Magazine</i>	2016
Best Talk Award, Environmental Science, SES Research Review, Stanford University	2016
Oakland Museum of California “Agent of Change”	2015
“Ten under 30: Young leaders changing the American West,” <i>High Country News</i>	2015
“Research as Art” competition winner, School of Earth Sciences, Stanford University	2015, 2012
ThinkSwiss Award, Swiss National Science Foundation, “NCCR Climate Summer School,” Grindelwald, Switzerland	2013
Invitee, NCAR Undergraduate Leadership Workshop, Boulder, CO	2010
Guillermo Salazar Rodriguez Undergraduate Scholarship, American Meteorological Society	2010
Winner, Prized Writing Competition, Scientific & Technical Writing, Univ. of California, Davis	2010, 2008
UC Davis Integrated Studies Honors Program International Education Award	2008
UC Davis International Relations Study Abroad Award	2008
Edward Kraft Prize, University of California, Davis	2008
Henry A. Jastro Recruitment Scholarship, University of California, Davis	2007-2009

Other scientific presentations

Oral presentations

- “Climate change is narrowing and shifting windows favorable for prescribed fire in western United States,” *American Geophysical Union Fall Meeting, Chicago, IL* * Dec. 2022
- “ARkStorm 2.0: Developing a new extreme atmospheric river storm scenario for 21st century California,” *International Atmospheric Rivers Conference* (virtual meeting)* Oct. 2020
- “Dynamics of and precursors to California megafloods, present and future,” *American Meteorological Society Annual Meeting, Phoenix, AZ* Jan. 2019
- “Increasing climate whiplash in 21st century California,” *American Geophysical Union Fall Meeting, New Orleans, LA* Dec. 2017
- “California precipitation extremes in a warming world,” *Sustainable LA Water Research Grand Challenge Research Symposium, Los Angeles, CA* Nov. 2017

Poster presentations

- “Is society ready for increasing climate whiplash?” *2019 Israeli-American Kavli Frontiers of Science Symposium, Jerusalem, Israel* Sep. 2019
- “Connections between the tropical Pacific Ocean, Arctic sea ice, and anomalous northeastern Pacific ridging,” *American Geophysical Union Fall Meeting, San Francisco, CA* Dec. 2016
- “Character and causes of changing Pacific climate extremes: Special focus on the extraordinary 2012-2015 California drought,” *Young Environmental Scholars Conference, Stanford, CA* Dec. 2015
- “The Extraordinary California Drought of 2013-2014: Character, Context, and the Role of Climate Change,” *American Geophysical Union Fall Meeting, San Francisco, CA* Dec. 2014
- “The Extraordinary California Drought of 2013-2014: Character, Context, and the Role of Climate Change,” *Graduate Climate Conference, Seattle, WA* Nov. 2014
- “The Extraordinary California Drought of 2013-2014: Character, Context, and the Role of Climate Change,” *Fourth Workshop on understanding Climate Change from Data, National Center for Atmospheric Research, Boulder, CO* Jun. 2014
- “Evaluation of high-resolution simulations of Northeast Pacific atmospheric rivers,” *American Geophysical Union Fall Meeting, San Francisco, CA* Dec. 2013
- “Mid-Latitude Precipitation Extremes: Latitudinal Linkages and Climate Change,” *Swiss National Center for Competence in Research (NCCR Climate), Grindelwald, Switzerland* Sep. 2013
- “High-resolution seasonal simulations of Northeast Pacific atmospheric rivers and comparison to in-situ observations,” *American Geophysical Union Fall Meeting, San Francisco, CA* Dec. 2012

Academic service activities and professional affiliations

Journal Manuscript Referee: *Geophysical Research Letters* (29 reviews), *Journal of Climate* (12 reviews), *Journal of Geophysical Research—Atmospheres* (7 reviews), *Environmental Research Letters* (4 reviews), 2013-present

Climatic Change (2 reviews), *International Journal of Climatology* (2 reviews), *Science Advances* (3 reviews), *Scientific Reports* (2 reviews), *Advances in Water Resources* (1 review), *Bulletin of the American Meteorological Society* (3 reviews), *Communications Earth and Environment* (1 review), *Earth's Future* (1 review), *Nature* (1 review), *Nature Climate Change* (1 review), *Nature Communications* (1 review), *Proceedings of the National Academy of Sciences* (1 review)

External Reviewer, University of California personnel advancement dossiers	2022
Associate Editor, <i>Frontiers in Climate</i> , Climate, Ecology, and People section	2021-2022
Ad Hoc Reviewer, NSF Paleo Perspectives on Climate Change (P2C2) Program	2021
Ad Hoc Reviewer, NSF Industry-University Research Partnerships	2021
AGU Outstanding Student Presentation Award Judge, AGU Fall Meeting	2019
Expert Reviewer, United Nations International Strategy for Disaster Reduction (UNISDR) Global Assessment Report on Disaster Risk Reduction (GAR) 2019	2019
Expert Reviewer, California's Fourth Climate Change Assessment	2018
President, American Meteorological Society Student Chapter, UC Davis	2009-2011
AGU Fall Meeting session co-convener: "Bridging the Gap from Climate to Extreme Weather: Observations, Theory and Modeling" (2019), "Tropical Cyclones in the Global Climate System" (2010)	2019, 2010
Member, American Association for the Advancement of Science (AAAS)	2017-present
Member, American Geophysical Union (AGU)	2010-present
Member, American Meteorological Society (AMS)	2007-present