

DANIEL L. SWAIN

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 Updated: April 13, 2017

Education

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

Research Interests

Regional climate change, hydrological extremes, extreme event detection/attribution, tropical/Arctic/mid-latitude interactions, science writing & communication

Peer-Reviewed Publications

- Diffenbaugh, N.S., Singh, D., Mankin, J.S., Charland, A., Horton, D.E., Haugen, M., **Swain, D.L.**, Rajaratnam, B., Touma, D., "Quantifying the influence of global warming on unprecedented extreme climate events," *Proceedings of the National Academy of Sciences (in press)* 2017
- 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 Review: Atmospheres*, 121, doi:10.1002/2016JD025116, 2016. 2016
- 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, doi: 10.1126/sciadv.1501344, 2016. 2016
- 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 observations, *Monthly Weather Review*, 143, 3556-3569, doi: 10.1175/MWR-D-15-0079.1, 2015. 2015
- 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. 2015
- Diffenbaugh, N.S., **D.L. Swain** and D. Touma, Anthropogenic warming has increased drought risk in California, *Proceedings of the National Academy of Sciences*, doi:10.1073/pnas.1422385112, 2015. 2015
- 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* 2014

Meteorological Society, 95 (9), S3–S7, 2014.

Publications Submitted/in Preparation

- Swain, D.L.**, D. Singh, D.E. Horton, J.S. Mankin, T. Ballard, and N.S. Diffenbaugh, “Earth system linkages to anomalous northeastern Pacific atmospheric ridging” (*in revision*) 2017
- Swain, D.L.**, B. Langenbrunner, J.D. Neelin, K. Gonzales, and A. Hall, “Increasing weather whiplash in 21st century California” (*in prep*) 2017

Scientific Perspectives and Commentaries

- 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 Review Letters*, 10.1002/2015GL066628, 2015.

Selected Honors and Awards

- NatureNet Postdoctoral Fellowship, Nature Conservancy 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
- “Ten under 30: Young leaders changing the American West,” *High Country News* 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
- Winner, Prized Writing Competition, Scientific & Technical Writing, Univ. of California, Davis 2010, 2008
- Guillermo Salazar Rodriguez Undergraduate Scholarship, American Meteorological Society 2010
- Regents Scholarship, University of California, Davis 2009-2011
- American Meteorological Society Undergraduate Scholar 2007-2009
- Henry A. Jastro Scholarship, University of California, Davis 2007-2009
- NASA Ames/AIAA Galileo Memorial Scholarship 2007

Invited Scientific Presentations

- Swain, D.L.**, and N.S. Diffenbaugh, “Trends in persistent seasonal-scale atmospheric circulation patterns responsible for precipitation and temperatures extremes in California,” *American Geophysical Union Fall Meeting*, San Francisco, CA (*invited speaker*) Dec. 2015
- Swain, D.L.**, “Drought causes,” *American Geophysical Union Chapman Conf. on California Drought: Causes, Impacts, & Policy*, Univ. of California, Irvine (*invited panelist*) Apr. 2015
- Swain, D.L.**, “The extraordinary 2012-2015 drought in California and its context in a warming world,” *Water Scarcity in the West: Past, Present, Future Conference*, Univ. of California, Davis (*invited speaker and panelist*) Apr. 2015
- Swain, D.L.**, “Persistent atmospheric patterns and the ongoing California drought: the role of the Ridiculously Resilient Ridge,” *NASA Earth Science Seminar*, NASA Ames, Mountain View, CA (*invited speaker*) Mar. 2015
- Swain, D.L.**, Touma, D., Singh, D., Tsiang, M., Haugen, M., Charland, A., Rajaratnam, B., and N. S. Diffenbaugh, “The extraordinary California drought of 2012-2015: Historical context and the role of climate change,” *Pacific Climate Workshop 2015*, Pacific Grove, CA (*invited speaker*) Mar. 2015
- Swain, D.L.**, Touma, D., Singh, D., Tsiang, M., Haugen, M., Charland, A., Rajaratnam, B., and N. S. Diffenbaugh, “The extraordinary California drought of 2012-2015: Historical context and the role of climate change,” *Atmosphere and Energy Departmental Seminar*, Stanford University, Stanford, CA (*invited speaker*) Mar. 2015

Professional Experience

Scientific Research

- Postdoctoral Scholar, Institute of the Environment & Sustainability** 2016-Present
University of California, Los Angeles
 Investigate the character and causes of changes in hydrological cycle extremes in California.
- Research Assistant, Climate and Earth System Dynamics Group** 2011-2016
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, NASA/National Center for Suborbital Research** 2010
University of California, Irvine
 Obtain “ground truth” measurements for comparison to NASA overflights with hyperspectral imager as part of agricultural evapotranspiration study.

Science Communication

- Author & Founder, Weather West/California Weather 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 in real-time.

Atmospheric and Climate Science Liaison

2013-present

Extensive engagement with local, national, and international news media regarding weather, climate, and climate change issues in the American West.

Interviews with BBC, ABC, CBS, NPR, PBS, Al Jazeera; Danish, Norwegian, and German public television; New York Times, Washington Post, Los Angeles Times, San Francisco Chronicle, Sacramento Bee, KQED, KPCC, Scientific American, National Geographic, Popular Science, The Economist, Bloomberg, Vice Magazine, Slate Magazine, Bay Nature Magazine, Outside Magazine, Sunset Magazine, BuzzFeed, Mashable, and numerous other outlets. Ongoing relationship with “new media” organizations focusing on climate change communication and the broad dissemination of new scientific findings, including Climate Nexus and Climate Central. Give regular talks and engage in discussions in a variety of public forums, including museum-related outreach via California Academy of Science and the Oakland Museum of California.

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

Course: The Blue Planet: Introduction to Oceanography

Stanford University

2013-2016

Courses: Atmosphere, Ocean & Climate Dynamics 1 & 2; Stanford Pre-Collegiate Institutes

Public and Community Outreach

Climate Feedback expert reviewer, assessing national/international media coverage on climate change and extreme weather Sep. 2016-present

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 May 2014

Ridge in Context: Climate Variability of California's Past, Present, and Future," Bill Lane Center for the American West, Stanford University, Stanford, CA

Invited Speaker and Panelist, "Current Drought: Causes, how bad is it, and will we see more?" University of California Drought Summit, California State Capitol, Sacramento, CA Apr. 2014

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

Active engagement with various science communication and education programs, including the Woods Institute for the Environment, the Bill Lane Center for the American West, Stanford Science Podcast, KSZU Campus Radio, and Stanford Daily Q&A sessions 2013-present

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

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

Other Awards, Grants, and Recognitions

"Must Follow" Social Media Meteorologist/Climatologist, Forbes Magazine 2016

Best Talk, Environmental Science, SES Research Review, Stanford University 2016

Profile by Oakland Museum of California (*Inside Out*), "A Changing California" 2015

Travel Grant, University of California, Davis, "Water Scarcity in the West: Past, Present, and Future" Conference, University of California, Davis, Davis, CA 2015

Travel Award, University Corporation for Atmospheric Research, "AGU Chapman Conference on the California Drought," Irvine, CA 2015

Travel Award, University of Washington, "2014 Graduate Climate Conference," Pack Forest, WA 2014

Travel Award, National Center for Atmospheric Research/IMAGE, "4th Annual Workshop on Understanding Climate Change from Data," Boulder, CO 2014

Travel Grant, University of California, Davis, "University of California Drought Science, Policy & Management Summit," Sacramento, CA 2014

ThinkSwiss Grant, Swiss National Science Foundation, "NCCR Climate Summer School 2013," Grindelwald, Switzerland 2013

Travel Award, National Center for Atmospheric Research, "Community Earth System Model Tutorial," Boulder, CO 2013

Invitee, NCAR Undergraduate Leadership Workshop 2010

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

Other Publications and Science Writing

Swain, D.L., *Outside Magazine*, ongoing contributor, various articles 2015-2016

Swain, D.L., *KQED Public Media*, ongoing contributor, various articles 2015-2016

Diffenbaugh, N.S., and **D.L. Swain**, “Climate Change and the California Drought,” article for Brookings Institution *PlanetPolicy* blog, 06 October 2014. Available online at: <http://www.brookings.edu/blogs/planetpolicy/posts/2014/10/06-climate-change-california-drought-diffenbaugh-swain> 2014

Swain, D.L., and N.S. Diffenbaugh, “Viewpoints: Climate change is increasing the chances of drought,” *Sacramento Bee* Op-Ed, 30 September 2014. Available online at: <http://www.sacbee.com/opinion/op-ed/article2615493.html> 2014

Swain, D.L., 2010, “Ongoing Changes in Arctic Sea Ice and Impacts on Northern Hemisphere Atmospheric Circulation,” *Prized Writing 2009-2010*, P. Demory, Ed., Univ. of California, Davis, 202-209. 2010

Swain, D.L., 2010, “Of Ice and Men: How changes in Arctic sea ice affect our climate, our weather, and our ways of life,” *Prized Writing 2009-2010*, P. Demory, Ed., Univ. of California, Davis, 210-217. 2010

Other Scientific Presentations

Poster Presentations

Swain, D.L., Horton, D.E., Singh, D., and N.S. Diffenbaugh, “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

Swain, D.L., Tsiang, M. Haugen, M., Singh, D., Charland, A., Rajaratnam, B., and N.S. Diffenbaugh, “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

Swain, D.L., Tsiang, M. Haugen, M., Singh, D., Charland, A., Rajaratnam, B., and N.S. Diffenbaugh, “The Extraordinary California Drought of 2013-2014: Character, Context, and the Role of Climate Change,” *Graduate Climate Conference*, University of Washington (Pack Forest), Eatonville, WA Nov. 2014

Swain, D.L., Tsiang, M. Haugen, M., Singh, D., Charland, A., Rajaratnam, B., and N.S. Diffenbaugh, “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

Swain, D.L., Lebassi-Habtezion, B., and N.S. Diffenbaugh, “Evaluation of high-resolution simulations of Northeast Pacific atmospheric rivers,” *American Geophysical Union Fall Meeting*, San Francisco, CA Dec. 2013

Swain, D.L., Lebassi-Habtezion, B., and N.S. Diffenbaugh, “Mid-Latitude Precipitation Extremes: Latitudinal Linkages and Climate Change,” *Swiss National Center for Competence in Research (NCCR Climate)*, Grindelwald, Switzerland Sep. 2013

Swain, D.L., Lebassi-Habtezion, B., and N.S. Diffenbaugh, “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

Professional Affiliations and Activities

Journal Manuscript Referee (*Nature*, *Geophysical Research Letters*, *Journal of Climate*, *Bulletin of the American Meteorological Society*, *Nature Scientific Reports*, *Nature Climate Change*) 2013-present

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

President, American Meteorological Society Student Chapter, UC Davis 2009-2011