



## Noah Diffenbaugh

Kara J. Foundation Professor and Kimmelman Family Senior Fellow at the Woods Institute for the Environment

Earth System Science

### Bio

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#### BIO

Dr. Noah Diffenbaugh is the Kara J Foundation Professor and Kimmelman Family Senior Fellow at Stanford University. He studies the climate system, including the processes by which climate change could impact agriculture, water resources, and human health. Dr. Diffenbaugh has served the scholarly community in a number of roles, including as a current Editor of the peer-review journal *Earth's Future*, and as Editor-in-Chief of the peer-review journal *Geophysical Research Letters* from 2014-2018. He has also served as a Lead Author for the Intergovernmental Panel on Climate Change (IPCC), and has provided testimony and scientific expertise to Federal, State and local officials. Dr. Diffenbaugh is an elected Fellow of the American Geophysical Union (AGU), and is a recipient of the James R. Holton Award and William Kaula Award from the AGU, and a CAREER award from the National Science Foundation. He has been recognized as a Kavli Fellow by the U.S. National Academy of Sciences, and as a Google Science Communication Fellow.

#### ACADEMIC APPOINTMENTS

- Professor, Earth System Science
- Senior Fellow, Stanford Woods Institute for the Environment
- Affiliate, Precourt Institute for Energy

#### ADMINISTRATIVE APPOINTMENTS

- Kara J Foundation Professor, School of Earth, Energy and Environmental Sciences, Stanford University, (2017- present)
- Kimmelman Family Senior Fellow, Woods Institute for the Environment, Stanford University, (2017- present)
- Professor of Earth System Science, Stanford University, (2016- present)
- Senior Fellow, Woods Institute for the Environment, Stanford University, (2013- present)
- Associate Professor of Environmental Earth System Science, Stanford University, (2013-2016)
- Assistant Professor of Environmental Earth System Science, Stanford University, (2009-2013)
- Center Fellow, Woods Institute for the Environment, Stanford University, (2009-2013)
- Associate Professor of Earth and Atmospheric Sciences, Purdue University, (2008-2009)
- Assistant Professor of Earth and Atmospheric Sciences, Purdue University, (2004-2008)
- Postgraduate Research Earth Scientist, University of California, Santa Cruz, (2003-2004)

#### HONORS AND AWARDS

- Fellow, American Geophysical Union (2020)
- William Kaula Award, American Geophysical Union (2020)
- James R. Holton Award, American Geophysical Union (2006)

- Highly Cited Research, Clarivate Web of Science (2020)
- Timothy J. O’Leary, S. J., Distinguished Scientist, Gonzaga University (2018)
- Kavli Fellow, U.S. National Academy of Sciences (2010, 2016)
- NSF CAREER Award, National Science Foundation (2010 - 2015)
- Google Science Communication Fellow, Google (2011)
- Faculty Scholar, Stanford University (2015 – 2016)
- Stanford Fellow, Stanford University (2013 - 2015)
- Terman Fellowship, Stanford University (2009 - 2012)
- University Faculty Scholar, Purdue University (2009)
- ARCS Scholar, ARCS Foundation (2002 - 2003)
- Regents Fellowship, University of California (2000 - 2001)
- Editors’ Highlight, Herrera-Estrada and Diffenbaugh, 2020, Water Resources Research (2020)
- Featured Article, Goss et al., 2020, Environmental Research Letters (2020)
- Journal Highlight, Batibeniz et al., 2020, Earth’s Future (2020)
- "Top 10 Stories of 2019", Diffenbaugh and Burke, PNAS, 2019, Proceedings of the National Academy of Sciences (2019)
- ISI “Highly Cited Paper”, Diffenbaugh and Burke, PNAS, 2019, Thompson Reuters (2019)
- Journal Highlight, Gonzales et al., 2019, Journal of Geophysical Research-Atmospheres (2019)
- ISI “Highly Cited Paper”, Burke et al., Nature, 2018, Thompson Reuters (2018)
- Panelist, 154th National Academy of Sciences Annual Meeting, National Academy of Sciences (2017)
- Geosciences Distinguished Lecture, National Science Foundation (2016)
- Introductory Speaker, US Kavli Frontiers of Science, National Academy of Sciences (2016)
- ISI “Hot Paper” and “Highly Cited Paper”, Diffenbaugh et al., PNAS, 2015, Thompson Reuters (2015)
- “2015 Highlights”, Mankin et al., Environmental Research Letters (2015)
- “California Game Changers at COP21”, NexGen Climate America (2015)
- ISI "Highly Cited Paper", Swain et al., Bulletin of the American Meteorological Society, Thompson Reuters (2014)
- ISI “Highly Cited Paper”, Horton et al., Nature Climate Change, 2014, Thompson Reuters (2014)
- ISI “Highly Cited Paper”, Singh et al., Nature Climate Change, 2014, Thomson Reuters (2014)
- School of Earth Sciences Undergraduate Teaching Recognition, Stanford University (2014)
- ISI "Highly Cited Paper", Diffenbaugh and Field, Science, 2013, Thompson Reuters (2013)
- ISI “Highly Cited Paper”, Diffenbaugh et al., Nature Climate Change, 2013, Thomson Reuters (2013)
- Fifth Anniversary Collection, Diffenbaugh et al., 2011, Environmental Research Letters (2011)
- “2011 Highlights”, Diffenbaugh et al., Environmental Research Letters (2011)
- AGU Research Spotlight, Diffenbaugh and Ashfaq, GRL, American Geophysical Union (2010)
- “2009 Highlights,” Ahmed et al., Environmental Research Letters (ERL) (2009)
- Fifth Anniversary Collection, Jackson et al., Environmental Research Letters, (2008)
- NSF Highlight of significant achievement toward strategic outcome goals, Trapp et al., 2007, National Science Foundation (2008)
- “Best of 2008,” Diffenbaugh et al., Environmental Research Letters (ERL) (2008)
- “Best of 2008,” Jackson et al, Environmental Research Letters (2008)
- Purdue President’s Nominee - Packard Fellowship for Science and Engineering, Purdue University (2007)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- Editor, Earth's Future (2020 - present)
- Editor-in-Chief, Geophysical Research Letters (2015 - 2019)
- AB 2800 Climate Safe Infrastructure Working Group, State of California (2017 - 2018)
- Undergraduate Advisory Council, Vice Provost for Undergraduate Education, Stanford University (2014 - 2018)
- Faculty Advisory Board, Introductory Seminar Program, Stanford University (2013 - 2016)
- Member, Science Advisory Board, Climate Research Program, Lawrence Livermore National Lab (2016 - present)
- Earth Council, School of Earth, Energy and Environmental Sciences (2016 - present)
- Earth Sciences Council, School of Earth Sciences, Stanford University (2014 - 2015)
- Undergraduate Teaching Recognition, School of Earth Sciences, Stanford University (2014 - 2014)
- Dean's Teaching Task Force, School of Earth Sciences, Stanford University (2013 - 2014)
- Search Committee (co-Chair), Coastal Human-Environment Systems, Stanford University (2013 - 2014)
- Faculty Committee, Sustainable Urban Systems initiative, Stanford University (2013 - 2013)
- Director, Goldman Honors Program in Environmental Science, Technology and Policy, Stanford University (2012 - 2015)
- Member, Science Advisory Board, Climate Change Science Institute, Oak Ridge National Laboratory (2012 - 2015)
- Academic Guidance Committee, Emmett Interdisciplinary Program in Environment and Resources (E-IPER), Stanford University (2012 - 2013)
- Faculty Mentor, MUIR Woods Undergraduate Research Program, Stanford University (2012 - 2012)
- Faculty Mentor, Stanford Leland Scholars Program, Stanford University (2012 - 2012)
- Committee on the Effects of Provisions in the Internal Revenue Code on Greenhouse Gas Emissions, National Academy of Sciences (2011 - 2013)
- Member, Sustainability 2.0 faculty committee, Stanford University (2011 - 2012)
- Climate Science Day on Capitol Hill, February 16-17, 2011, American Geophysical Union (2011 - 2011)
- Organizing Committee, Simulating the Spatial-Temporal Patterns of Anthropogenic Climate Change, Los Alamos Institute for Advanced Studies Workshop (2011 - 2011)
- Co-Term Advisor, Earth Systems Program, Stanford University (2010 - present)
- Pre-Major Advisor, Stanford University (2010 - present)
- Scientific Research Computing Facility Faculty Committee, Stanford University (2010 - present)
- Stanford University Member Representative, University Corporation for Atmospheric Research (2010 - present)
- Lead Author, Working Group II, Intergovernmental Panel on Climate Change (2010 - 2014)
- Graduate Admissions Committee, E-IPER, Stanford University (2010 - 2013)
- Undergraduate Education Committee, School of Earth Sciences, Stanford University (2010 - 2013)
- Faculty Mentor, School of Earth Sciences High School Intern Program, Stanford University (2010 - 2012)
- Environmental Forum Organizing Committee, Woods Institute for the Environment, Stanford University (2010 - 2011)
- Co-Director, Fifth ICTP Workshop on the Theory and Use of Regional Climate Models, May, 2010, Trieste, Italy, International Centre for Theoretical Physics (2010 - 2010)
- Organizing Committee, Climate Change Modeling and Scaling Workshop, U.S. National Climate Assessment (2010 - 2010)
- Adjunct Associate Professor of Earth and Atmospheric Sciences, Purdue University (2009 - present)
- Affiliated Faculty, Emmett Interdisciplinary Program in Environment and Resources (E-IPER), Stanford University (2009 - present)
- Committee of the Whole, Earth Systems Program, Stanford University (2009 - present)
- Editor, Geophysical Research Letters (2009 - 2014)
- Graduate Admissions Committee, Department of Environmental Earth System Science, Stanford University (2009 - 2013)

- Co-Chair, Paleooceanography and Paleoclimatology General Contributions, 2009 Joint Assembly, May 24-29, Toronto, Canada, American Geophysical Union (2009 - 2009)
- DOE Climate Change Science: Focus Group, July 27-28, Washington, D.C., Department of Energy (2009 - 2009)
- Executive Committee, Atmospheric Sciences Section, American Geophysical Union (2008 - present)
- Atmospheric Science Section Representative, Eos Advisory Board, American Geophysical Union (2008 - 2009)
- Interim Director, Purdue Climate Change Research Center, Purdue University (2008 - 2009)
- Co-Chair, Regional-Scale Forcing of Climate, AGU Fall Meeting, San Francisco, CA, December 15-19, American Geophysical Union (2008 - 2008)
- Co-Chair, Transitioning Out of the Mid-Holocene Climate: An Evaluation of Land-Ocean Proxy Records and Model Simulations, AGU Fall Meeting, San Francisco, CA, December 15-19, American Geophysical Union (2008 - 2008)
- Coordinating Lead Author, Climate Change in Indiana: Initial Analyses of Impacts and Opportunities, an analysis of S.2191, U.S. Senator Richard Lugar's office (2008 - 2008)
- Proposal Panelist – DOE (National Lab Climate Change Scientific Focus Areas; Regional Models for Climate Change Integrated Assessment); NASA (Modeling, Analysis, and Prediction); NOAA (Climate Prediction Program for the Americas); NSF (CDI-II); U.S. CLIVAR (Drought in Coupled Models Project), DOE, NASA, NOAA, NSF, U.S. CLIVAR (2007 - present)
- Member, Terrestrial Ecosystems and Climate Policy Working Group, National Center for Ecological Analysis and Synthesis (2007 - 2010)
- Contributing Author, CCSP Synthesis and Assessment Product 3.4, Abrupt Climate Change, Hydrologic Variability and Change, Chapter 3, U.S. Geological Survey (2007 - 2008)
- Book Chapter Referee – Climate Impact Hotspots: Key Vulnerable Regions and Climate Change, Publishing (2007 - 2007)
- Report Referee, California Energy Commission, State of Washington (2007 - 2007)
- Short Term Visitor, Abdus Salam International Centre for Theoretical Physics (2006 - present)
- Co-Guest Editor, Glacial-Interglacial Climate of the Past 160,000 Years: New Insights from Data and Models, Special Issue, Palaeogeography, Palaeoclimatology, Palaeoecology (2006 - 2006)
- Contributor, Agency Technical Working Group, Potential Effects of Climate Change on New Mexico, State of New Mexico (2006 - 2006)
- Journal Manuscript Referee, Journal of Geophysical Research – Atmospheres, Journal of Hydrometeorology, Limnology and Oceanography, Meteorological Applications, Nature, Paleooceanography (2003 - present)
- Journal Manuscript Referee, International Journal of Climatology, International Journal of Environmental Research and Public Health, Journal of Applied Meteorology and Climatology, Journal of Climate (2003 - present)
- Journal Manuscript Referee, Agricultural and Forest Meteorology, Atmospheric Research, Climate Dynamics, Climate Research, Climatic Change, Earth Interactions, Eos, Geology, Geophysical Research Letters, Global and Planetary Change (2003 - present)
- Journal Manuscript Referee, Proceedings of the National Academy of Sciences, Quaternary International, Quaternary Research, Quaternary Science Reviews, Theoretical and Applied Climatology, Water Resources Management (2003 - present)
- Co-Chair, Climate of the Last Glacial-Interglacial Cycle: New Insights From Models and Data, AGU Fall Meeting, San Francisco, CA, December 8-12, American Geophysical Union (2003 - 2003)

## PROFESSIONAL EDUCATION

- Ph.D., University of California, Santa Cruz , Earth Sciences (2003)
- M.S., Stanford University , Earth Systems (1997)
- B.S., Stanford University , Earth Systems (1997)

## LINKS

- Climate and Earth System Dynamics Group: <https://pangea.stanford.edu/researchgroups/cesd/>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

The Climate and Earth System Dynamics Group is led by Prof. Noah S. Diffenbaugh. Our research takes an integrated approach to understanding climate dynamics and climate impacts by probing the interface between physical processes and natural and human vulnerabilities. This interface spans a range of spatial and temporal scales,

and a number of climate system processes. Much of the group's work has focused on the role of fine-scale processes in shaping climate change impacts, including studies of extreme weather, water resources, agriculture, human health, and poverty vulnerability.

We use the present vulnerabilities of natural and human systems to identify the climate phenomena that exert the most direct and acute influence on climate-sensitive systems. We then employ a suite of numerical modeling and data analysis techniques to understand why those physical phenomena occur in the current climate, by what mechanisms those physical phenomena are likely to respond to changes in climate “forcing”, and how those physical responses could impact humanity and other life. Employing this approach across a range of climate-sensitive systems has led to insights about (1) the importance of fine-scale climate processes in shaping the pattern and magnitude of climate change, (2) the importance of interactions between physical processes and human dimensions in shaping the impacts of climate change, and (3) the likelihood that high-impact climate change will occur locally and regionally at different levels of global warming.

Our ongoing research activities are directed at answering a suite of specific questions about the interaction of physical climate processes and climate-sensitive systems. These questions include:

- What are the climate phenomena that most impact natural and human systems?
  
- What physical processes control the frequency and severity of those phenomena at present?
  
- How do those physical processes respond to changes in forcing of the climate system (such as from changes in greenhouse gas concentrations or variations in Earth's orbit)?
  
- How are natural and human systems likely to be impacted by changes in those physical processes?

## Teaching

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### COURSES

#### 2020-21

- Climate Change: An Earth Systems Perspective: ESS 305 (Aut)
- Climate and Society: EARTH 2 (Win)
- Prehonors Seminar: ENVRINST 198 (Spr)
- The Global Warming Paradox: EARTHSYS 41N (Aut)

#### 2019-20

- Climate Change: An Earth Systems Perspective: ESS 305 (Aut)
- Climate and Society: EARTH 2 (Win)
- Prehonors Seminar: ENVRINST 198 (Spr)
- The Global Warming Paradox: EARTHSYS 41N (Aut)

#### 2018-19

- Climate Change: An Earth Systems Perspective: ESS 305 (Aut)
- Climate and Society: EARTH 2 (Win)
- Prehonors Seminar: ENVRINST 198 (Spr)
- The Global Warming Paradox: EARTHSYS 41N (Aut, Sum)

## 2017-18

- Climate Change: An Earth Systems Perspective: ESS 305 (Aut)
- Climate and Society: EARTH 2 (Win)
- Prehonors Seminar: ENVRINST 198 (Spr)
- The Global Warming Paradox: EARTHSYS 41N (Aut, Sum)

## STANFORD ADVISEES

### Postdoctoral Faculty Sponsor

Michael Goss

### Doctoral Dissertation Advisor (AC)

Katerina Gonzales

### Doctoral (Program)

Frances Davenport, Katerina Gonzales, Elizabeth Johnston, Amina Ly

## Publications

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### PUBLICATIONS

- **Contribution of historical precipitation change to US flood damages.** *Proceedings of the National Academy of Sciences of the United States of America*  
Davenport, F. V., Burke, M., Diffenbaugh, N. S.  
2021; 118 (4)
- **Moisture- Versus Wind-Dominated Flavors of Atmospheric Rivers** *GEOPHYSICAL RESEARCH LETTERS*  
Gonzales, K. R., Swain, D. L., Barnes, E. A., Diffenbaugh, N. S.  
2020; 47 (23)
- **Climate change is increasing the likelihood of extreme autumn wildfire conditions across California** *ENVIRONMENTAL RESEARCH LETTERS*  
Goss, M., Swain, D. L., Abatzoglou, J. T., Sarhadi, A., Kolden, C. A., Williams, A., Diffenbaugh, N. S.  
2020; 15 (9)
- **Landfalling Droughts: Global Tracking of Moisture Deficits From the Oceans Onto Land** *WATER RESOURCES RESEARCH*  
Herrera-Estrada, J. E., Diffenbaugh, N. S.  
2020; 56 (9)
- **Doubling of US Population Exposure to Climate Extremes by 2050** *EARTHS FUTURE*  
Batibeniz, F., Ashfaq, M., Diffenbaugh, N. S., Key, K., Evans, K. J., Turuncoglu, U., Onol, B.  
2020; 8 (4)
- **Verification of extreme event attribution: Using out-of-sample observations to assess changes in probabilities of unprecedented events.** *Science advances*  
Diffenbaugh, N. S.  
2020; 6 (12): eaay2368
- **Flood Size Increases Nonlinearly Across the Western United States in Response to Lower Snow-Precipitation Ratios** *WATER RESOURCES RESEARCH*  
Davenport, F. V., Herrera-Estrada, J. E., Burke, M., Diffenbaugh, N. S.  
2020; 56 (1)
- **Variations in the Intensity and Spatial Extent of Tropical Cyclone Precipitation** *GEOPHYSICAL RESEARCH LETTERS*  
Touma, D., Stevenson, S., Camargo, S. J., Horton, D. E., Diffenbaugh, N. S.  
2019
- **Recent Warming of Landfalling Atmospheric Rivers Along the West Coast of the United States** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Gonzales, K. R., Swain, D. L., Nardi, K. M., Barnes, E. A., Diffenbaugh, N. S.

2019; 124 (13): 6810–26

- **Disentangling the influence of local and remote anthropogenic aerosols on South Asian monsoon daily rainfall characteristics** *CLIMATE DYNAMICS*  
Singh, D., Bollasina, M., Ting, M., Diffenbaugh, N. S.  
2019; 52 (9-10): 6301–20
- **Global warming has increased global economic inequality.** *Proceedings of the National Academy of Sciences of the United States of America*  
Diffenbaugh, N. S., Burke, M.  
2019
- **Reply to Rosen: Temperature-growth relationship is robust.** *Proceedings of the National Academy of Sciences of the United States of America*  
Diffenbaugh, N. S., Burke, M.  
2019
- **Strengthened scientific support for the Endangerment Finding for atmospheric greenhouse gases.** *Science (New York, N.Y.)*  
Duffy, P. B., Field, C. B., Diffenbaugh, N. S., Doney, S. C., Dutton, Z., Goodman, S., Heinzerling, L., Hsiang, S., Lobell, D. B., Mickley, L. J., Myers, S., Natali, S. M., Parmesan, et al  
2018
- **Response of electricity sector air pollution emissions to drought conditions in the western United States** *ENVIRONMENTAL RESEARCH LETTERS*  
Herrera-Estrada, J. E., Diffenbaugh, N. S., Wagner, F., Craft, A., Sheffield, J.  
2018; 13 (12)
- **Multidimensional risk in a nonstationary climate: Joint probability of increasingly severe warm and dry conditions.** *Science advances*  
Sarhadi, A., Ausin, M. C., Wiper, M. P., Touma, D., Diffenbaugh, N. S.  
2018; 4 (11): eaau3487
- **Can ENSO-Like Convection Force an ENSO-Like Extratropical Response on Subseasonal Time Scales?** *JOURNAL OF CLIMATE*  
Goss, M., Lee, S., Feldstein, S. B., Diffenbaugh, N. S.  
2018; 31 (20): 8339–49
- **Characterizing the Spatial Scales of Extreme Daily Precipitation in the United States** *JOURNAL OF CLIMATE*  
Touma, D., Michalak, A. M., Swain, D. L., Diffenbaugh, N. S.  
2018; 31 (19): 8023–37
- **Large potential reduction in economic damages under UN mitigation targets** *NATURE*  
Burke, M., Davis, W., Diffenbaugh, N. S.  
2018; 557 (7706): 549–+
- **Unprecedented climate events: Historical changes, aspirational targets, and national commitments.** *Science advances*  
Diffenbaugh, N. S., Singh, D., Mankin, J. S.  
2018; 4 (2): eaao3354
- **Widespread persistent changes to temperature extremes occurred earlier than predicted** *SCIENTIFIC REPORTS*  
Li, C., Fang, Y., Caldeira, K., Zhang, X., Diffenbaugh, N. S., Michalak, A. M.  
2018; 8: 1007
- **Remote Linkages to Anomalous Winter Atmospheric Ridging Over the Northeastern Pacific** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Swain, D. L., Singh, D., Horton, D. E., Mankin, J. S., Ballard, T. C., Diffenbaugh, N. S.  
2017; 122 (22): 12194–209
- **Quantifying the influence of global warming on unprecedented extreme climate events** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
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; 114 (19): 4881–4886
- **The Role of Plant CO<sub>2</sub> Physiological Forcing in Shaping Future Daily-Scale Precipitation** *JOURNAL OF CLIMATE*  
Skinner, C. B., Poulsen, C. J., Chadwick, R., Diffenbaugh, N. S., Fiorella, R. P.  
2017; 30 (7): 2319–2340
- **Influence of internal variability on population exposure to hydroclimatic changes** *ENVIRONMENTAL RESEARCH LETTERS*

- Mankin, J. S., Viviroli, D., Mekonnen, M. M., Hoekstra, A. Y., Horton, R. M., Smerdon, J. E., Diffenbaugh, N. S.  
2017; 12 (4)
- **Drought and immunity determine the intensity of West Nile virus epidemics and climate change impacts** *PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES*  
Paull, S. H., Horton, D. E., Ashfaq, M., Rastogi, D., Kramer, L. D., Diffenbaugh, N. S., Kilpatrick, A. M.  
2017; 284 (1848)
  - **Influence of internal variability on population exposure to hydroclimatic changes.** *Environmental research letters : ERL [Web site]*  
Mankin, J. S., Viviroli, D., Mekonnen, M. M., Hoekstra, A. Y., Horton, R. M., Smerdon, J. E., Diffenbaugh, N. S.  
2017; 12 (4): 044007
  - **Probability of emergence of novel temperature regimes at different levels of cumulative carbon emissions** *FRONTIERS IN ECOLOGY AND THE ENVIRONMENT*  
Diffenbaugh, N. S., Charland, A.  
2016; 14 (8): 418-423
  - **Regional atmospheric CO2 inversion reveals seasonal and geographic differences in Amazon net biome exchange.** *Global change biology*  
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., Domingues, L. G., Joiner, et al  
2016; 22 (10): 3427-3443
  - **Recent amplification of the North American winter temperature dipole** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Singh, D., Swain, D. L., Mankin, J. S., Horton, D. E., Thomas, L. N., Rajaratnam, B., Diffenbaugh, N. S.  
2016; 121 (17): 9911-9928
  - **Dislocated interests and climate change** *ENVIRONMENTAL RESEARCH LETTERS*  
Davis, S. J., Diffenbaugh, N.  
2016; 11 (6)
  - **Trends in atmospheric patterns conducive to seasonal precipitation and temperature extremes in California.** *Science advances*  
Swain, D. L., Horton, D. E., Singh, D., Diffenbaugh, N. S.  
2016; 2 (4)
  - **Recent amplification of the North American winter temperature dipole.** *Journal of geophysical research. Atmospheres : JGR*  
Singh, D., Swain, D. L., Mankin, J. S., Horton, D. E., Thomas, L. N., Rajaratnam, B., Diffenbaugh, N. S.  
2016; 121 (17): 9911–28
  - **Observed and projected climate trends and hotspots across the National Ecological Observatory Network regions** *FRONTIERS IN ECOLOGY AND THE ENVIRONMENT*  
Anderegg, W. R., Diffenbaugh, N. S.  
2015; 13 (10): 547-552
  - **Debunking the climate hiatus** *CLIMATIC CHANGE*  
Rajaratnam, B., Romano, J., Tsiang, M., Diffenbaugh, N. S.  
2015; 133 (2): 129-140
  - **The potential for snow to supply human water demand in the present and future** *ENVIRONMENTAL RESEARCH LETTERS*  
Mankin, J. S., Viviroli, D., Singh, D., Hoekstra, A. Y., Diffenbaugh, N. S.  
2015; 10 (11)
  - **Future property damage from flooding: sensitivities to economy and climate change** *CLIMATIC CHANGE*  
Liu, J., Hertel, T. W., Diffenbaugh, N. S., Delgado, M. S., Ashfaq, M.  
2015; 132 (4): 741-749
  - **Evaluation of Nonhydrostatic Simulations of Northeast Pacific Atmospheric Rivers and Comparison to in Situ Observations** *MONTHLY WEATHER REVIEW*  
Swain, D. L., Lebas-Habtezion, B., Diffenbaugh, N. S.  
2015; 143 (9): 3556-3569
  - **Rate and velocity of climate change caused by cumulative carbon emissions** *ENVIRONMENTAL RESEARCH LETTERS*



- LoPresti, A., Charland, A., Woodard, D., Randerson, J., Diffenbaugh, N. S., Davis, S. J.  
2015; 10 (9)
- **Influence of temperature and precipitation variability on near-term snow trends** *CLIMATE DYNAMICS*  
Mankin, J. S., Diffenbaugh, N. S.  
2015; 45 (3-4): 1099-1116
  - **A multi-model and multi-index evaluation of drought characteristics in the 21st century** *JOURNAL OF HYDROLOGY*  
Touma, D., Ashfaq, M., Nayak, M. A., Kao, S., Diffenbaugh, N. S.  
2015; 526: 196-207
  - **Contribution of changes in atmospheric circulation patterns to extreme temperature trends.** *Nature*  
Horton, D. E., Johnson, N. C., Singh, D., Swain, D. L., Rajaratnam, B., Diffenbaugh, N. S.  
2015; 522 (7557): 465-469
  - **Anthropogenic warming has increased drought risk in California.** *Proceedings of the National Academy of Sciences of the United States of America*  
Diffenbaugh, N. S., Swain, D. L., Touma, D.  
2015; 112 (13): 3931-3936
  - **Projecting changes in annual hydropower generation using regional runoff data: An assessment of the United States federal hydropower plants** *ENERGY*  
Kao, S., Sale, M. J., Ashfaq, M., Martinez, R. U., Kaiser, D. P., Wei, Y., Diffenbaugh, N. S.  
2015; 80: 239-250
  - **Joint bias correction of temperature and precipitation in climate model simulations** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Li, C., Sinha, E., Horton, D. E., Diffenbaugh, N. S., Michalak, A. M.  
2014; 119 (23): 13153-13162
  - **THE EXTRAORDINARY CALIFORNIA DROUGHT OF 2013/2014: CHARACTER, CONTEXT, AND THE ROLE OF CLIMATE CHANGE** *BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY*  
Swain, D. L., Tsiang, M., Haugen, M., Singh, D., Charland, A., Rajaratnam, B., Diffenbaugh, N. S.  
2014; 95 (9): S3-S7
  - **SEVERE PRECIPITATION IN NORTHERN INDIA IN JUNE 2013: CAUSES, HISTORICAL CONTEXT, AND CHANGES IN PROBABILITY** *BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY*  
Singh, D., Horton, D. E., Tsiang, M., Haugen, M., Ashfaq, M., Mei, R., Rastogi, D., Johnson, N. C., Charland, A., Rajaratnam, B., Diffenbaugh, N. S.  
2014; 95 (9): S58-S61
  - **Occurrence and persistence of future atmospheric stagnation events** *NATURE CLIMATE CHANGE*  
Horton, D. E., Skinner, C. B., Singh, D., Diffenbaugh, N. S.  
2014; 4 (8): 698-703
  - **Uncertainties in the timing of unprecedented climates.** *Nature*  
Hawkins, E., Anderson, B., Diffenbaugh, N., Mahlstein, I., Betts, R., Hegerl, G., Joshi, M., Knutti, R., McNeall, D., Solomon, S., Sutton, R., Syktus, J., Vecchi, et al  
2014; 511 (7507): E3-5
  - **Observed changes in extreme wet and dry spells during the South Asian summer monsoon season** *NATURE CLIMATE CHANGE*  
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