A. PARK WILLIAMS
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Education

University of California, Santa Barbara	Ph.D. Geography	2009
University of California, Santa Barbara	M.A. Geography	2006
University of California, Irvine	B.S. Earth Systems Science	2003

Dissertation Title

Tree Rings, Climate Variability, and Coastal Summer Stratus Clouds in the Western United States. *Committee members: Dr. Christopher Still, Dr. Joel Michaelsen, Dr. Catherine Gautier, Dr. Steven Leavitt*

Research Interests

I am a multi-disciplinary hydroclimatologist whose research aims to understand the causes and consequences of hydrological extremes such as drought. While much of my research focuses on climatology in its own right, much of my research also aims to improve understanding of how hydrological extremes affect life on earth. Questions that I find especially interesting involve the effects of human-caused climate change on the hydrological cycle, and how these changes affect ecological systems and humanity through extreme events such as heat waves, wildfires, and flooding. My ultimate goal is to advance scientific knowledge in ways that are relevant to policy makers and future scientific endeavors, and also interesting to the public and other scientists.

Relevant Skills

Computer statistical programming (MATLAB); assimilation and analysis of large datasets; diagnostics of climate variability; remote sensing; time-series and geo-statistics; field work in ecology; construction and maintenance of weather stations; stable-isotope analysis; collection, measurement, and analysis of tree-ring samples; creativity in research; teaching and public speaking

Appointments

March 2021 – present: *Associate Professor*, University of California, Los Angeles, Department of Geography.

July 2020 – February 2021: *Lamont Associate Research Professor – Senior Staff*, Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY.

July 2017 – June 2020: *Lamont Associate Research Professor – Junior Staff*, Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY.

December 2013 – June 2017: *Lamont Assistant Research Professor*, Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY.

April 2011 – November 2013: *Postdoctoral researcher*, Los Alamos National Laboratory, New Mexico. Mentors: Dr. Nate McDowell (LANL) and Dr. Craig D. Allen (USGS).

October 2009 – February 2011: *Postdoctoral researcher*, University of California, Santa Barbara. Mentor: Dr. Christopher Funk (USGS) and Dr. Joel Michaelsen (UCSB).

September 2009 – December 2009: *Contracted researcher*, Bandelier National Monument. Mentors: Dr. Craig Allen (USGS), Dr. Tom Swetnam (U of Arizona), Dr. Constance

Millar (USFS). Worked as lead author on a *PNAS* special-issue article on drought and forests in the southwestern United States.

September 2003 – September 2009: *Graduate researcher*, University of California, Santa Barbara Department of Geography. Mentor: Dr. Christopher Still.

September 2008 – September 2009: *UC Santa Barbara Geography Department Lead Teaching Assistant*

August 2007 – September 2007: *Course instructor*, Geography 3B: Intro. to Physical Geography II: Land Surface Processes

September 2005 – September 2006: *Geography Department Graduate Student Representative* to the department's faculty

September 2004 – September 2005: *Graduate Student Association Representative* for the Geography Department.

September 2001 – June 2003: *Undergraduate researcher*, University of California, Irvine, Department of Ecology and Evolutionary Biology – Field, lab, and statistical research on tropical agroforestry in Costa Rica with Dr. F. Lynn Carpenter.

Fellowships, Grants, and Awards

2020 NASA Future investigators in NASA Earth and Space Science and Technology: *Building resilience to wildfires in the western United States: predictive modeling in a coupled climate and human system* (3-years of funding support for PhD student, Caroline Juang). PI: **AP Williams** (proposal written by C Juang)

2019 One of three finalists (not 1st place) for the Lamont-Doherty annual mentorship award

2019 Zegar Family Foundation: *Harnessing the big data and machine learning revolution to model wildfire across the Western United States* - $640,953. PIs: **AP Williams** (lead), P Gentine

2019 NOAA MAPP: *Integrating models, paleoclimate, and recent observations to develop process-level understanding of projected changes in US drought* - $198,022. PIs: BI Cook (lead), **AP Williams** (LDEO lead), K Marvel

2019 Lamont Climate Center Grant to study "*Biophysical climate regulation during postfire succession in the Alaskan boreal forest*" - $10,000. PI: W Hansen, **AP Williams**

2017 Palisades Geophysical Institute Young Scientist Award (4.5 months of funding per year for 2018-2020: ~$170,000). PI: **AP Williams**

2017 NSF PREEVENTS Track 1: Fire Prediction Across Scales Conference at Columbia University ($31,500). PIs: R Field (lead), K Fernandes, **AP Williams**

2017 NSF PIRE: *Climate Research Education in the Americas using Tree-ring and speleothem Examples (PIRE-CREATE)* ($4,997,208). PIs: M Vuille (lead), R D'Arrigo, A Dai, CT Lawson, L Andreu-Hayles, G Ceccantini , FW Cruz, ME Ferrero, EG Neves, Karmann I, GM Locosselli, MS Morales, CM Skott, JA Skrivanel, JE Smerdon, NM Strikis, R Villalba, **AP Williams**

2017 NASA Earth and Space Science Graduate Student Fellowship: *Attributing the causes of a century of wetting in the eastern United States using observations, models, and tree rings* (3-years of funding support for PhD student, Daniel Bishop). PI: **AP Williams** (proposal written by DA Bishop)

2017	NSF P2C2: *Inferring Spatio-Temporal Variations in the Risk of Extreme Precipitation in the Western United States from Tree Ring Chronologies* - $170,077. PIs: **AP Williams** (lead), M Ho, U Lall, ER Cook
2017	Lamont Climate Center Grant to host an international 3-day workshop at Columbia University: *The 2017 Conference on Fire Prediction Across Scales* - $10,000. PIs: R Field (lead), Fernandes K, **AP Williams**
2017	NSF P2C2: *Decomposition and reconstruction of drought variability across the continental U.S. and northern Mexico* - $501,014. PIs: **AP Williams** (lead), ER Cook
2017	NASA MAP: *Quantifying process-based variability and uncertainties in ocean, land, and atmosphere forcing of extra-tropical droughts and heat waves in GISS ModelE and observations* - $461,838. PIs: BI Cook (lead), **AP Williams** (LDEO Lead), MJ Puma, R Seager, Nazarenko L
2016	NSF P2C2: *Reconstruction and Dynamics of Interhemispheric Hydroclimate Variability Between the Americas* - $626,108. PIs: JE Smerdon (lead), ER Cook, R Seager, **AP Williams**
2016	Lamont Climate Center Grant to study "Net Primary Productivity Inferred from Tree-Ring Isotopes" - $10,000. PIs: M Levesque, L Andreu-Hayles, **AP Williams**
2016-2019	Fellowship from Columbia's Center for Climate and Life - $178,614
2014	Lamont Climate Center Grant to study "*Climatic Thresholds for Forests Across a Regional-Scale Moisture Gradient*" - $10,000. PI: **AP Williams**
2013	LAAP (Los Alamos Award Program) "Award for high level achievements in 2013" - $500
2013	The Ecological Society of America Biogeosciences Gene E. Likens Junior Scientist (early-career) Award - $250
2013	Co-PI – National Geographic Grant for field expedition in Ethiopia to sample for tree-ring isotopes. PI: Iain Robertson, Swansea University - £17,000
2009	The 2009 Graduate Student Excellence in Research Award – UC Santa Barbara Geography - $1,000
2007-2008	Travel grant to attend three meetings on the Biological Impacts of Climate Change in California (BICCCA) – California Energy Commission
2007	UCSB Dep. of Geography Dangermond Travel Scholarship - $500
2006	Outstanding Paper Award – American Geophysical Union fall meeting
2006	Nomination for campus-wide Outstanding Teaching Assistant award
2004-2007	NASA Earth System Science Graduate Student Fellowship - $78,000 + tuition over three years
2005	American Geophysical Union meeting travel grant – San Francisco
2004	Nomination for campus-wide Outstanding Teaching Assistant award
2003	Excellence in Undergraduate Research in the Biological Sciences at UC Irvine award
2002	UC Irvine Undergraduate Summer Research Grant - $3,000

Peer-Reviewed Publications

Under review. Zhou S, Lintner BR, **Williams AP**, Zhang Y, Seneviratne S, Gentine P. Positive soil moisture-precipitation feedbacks amplify extreme dry and wet spells in monsoon regions. *Nature Geoscience*.

In revision. Balch JK, Abatzoglou JT, Joseph MB, Koontz MJ, Mahood AL, McGlinchy J, Cattau ME, **Williams AP**. Warming weakens the nighttime barrier to global fire. *Nature*.

In revision. Hansen WD, **Williams AP**, Schwartz NB, Albrich K, Kueppers LM, Ramming A, Reyer CPO, Staver AC, Seidl R. Global hotspots of forest sensitivity to increasing climate variability.

Under review. Dong C, **Williams AP**, Abatzoglou JT, Lin K, Okin GS, Gillespie TW, Lin Y. -H. Hall A, MacDonald GM. Expanded fire season in southern California due to climate change. *Communications Earth & Environment*.

Submitted. Hammond W, **Williams AP**, Abatzoglou JT, Adams HD, Klein T, Rodríguez RL, Sàenz-Romero C, Hartmann H, Breshears DD, Allen CD. A hotter-drought fingerprint on Earth's forest mortality sites–warming accelerates risks. *Nature Plants*.

Submitted. Zhou S, Keenan TF, Lintner BR, **Williams AP**, Zhang Y, Gentine P. Vegetation responses to elevated CO2 are responsible for the large divergence in tropical hydrological projections. *Proceedings of the National Academy of Sciences USA*.

Under review. Rao K, **Williams AP**, Diffenbaugh NS, Yerba M, Konings AG. Plant-water sensitivity regulates wildfire vulnerability. *Proceedings of the National Academy of Sciences USA*.

Under review. Abatzoglou JT, Battisti DS, **Williams AP**, Hansen WD, Harvey BJ, Kolden CA. Continued increases in western US forest fire despite growing fuel constraints. *Nature Communications Earth & Environment*.

Under review. **Williams AP**, Livneh B, McKinnon KA, Hansen WD, Mankin JS, Cook BI, Smerdon JE, Varuolo-Clarke AM, Bjarke NR, Juang CS, Lettenmaier DP. Growing impact of wildfire on western United States water supply. *Proceedings of the National Academy of Sciences USA*.

In revision. Bishop DA, **Williams AP**, Seager R, Cook ER, Peteet DM, Cook BI, Rao MP, Stahle DW. Placing the east-west North American aridity gradient in a multi-century context. *Environmental Research Letters*.

Under review. Marvel K, Cook BI, **Williams AP**, Bonfils C. A delayed emergence of greenhouse gas-forced drought in the American Southwest. *AGU Advances*.

Under review. Borkotoky SS, **Williams AP**, Steinschneider S. Six hundred years of reconstructed atmospheric river activity along the US West Coast. *Journal of Geophysical Research – Atmospheres*.

Under review. **Williams AP**, Cook BI, Smerdon JE. Rapid intensification of the emerging North American megadrought in 2021. *Nature Climate Change*.

[101] In press. Steiger NJ, Smerdon JE, **Williams AP**, Seager R, Varuolo-Clarke A. Coupled megadrought risk in North and South America. *Nature Geoscience*, https://doi.org/10.1038/s41561-021-00819-9

[100] In press. Gershunov A, Guzman-Morales J, Hatchett B, Guirguis K, Aguilera R, Shulgina T, Abatzoglou JT, Cayan D, Pierce D, **Williams AP**, Small I, Clemesha R, Schwarz L, Benmarhnia T, Tardy A. Hot and cold flavors of southern California's Santa Ana winds: their causes, trends, and links with wildfire. *Climate Dynamics*, https://doi.org/10.1007/s00382-021-05802-z

[99] 2021. Cook BI, Mankin JS, **Williams AP**, Marvel KD, Smerdon JE, Liu H. Uncertainties, limits, and benefits for climate change mitigation for soil moisture drought in

Southwestern North America. *Earth's Future* 9(9):e2021EF002014, https://doi.org/10.1029/2021EF002014

[98] 2021. Marvel KD, Cook BI, Bonfils C, Smerdon JE, **Williams AP**, Liu H. Projected changes to hydroclimate seasonality in the continental United States. *Earth's Future* 9(9):e2021EF002019, https://doi.org/10.1029/2021EF002019

[97] 2021. Varuolo-Clarke AM, Smerdon JE, **Williams AP**, Seager R. Gross discrepancies between observed and simulated 20th to 21st-century precipitation trends in Southeastern South America. *Journal of Climate* 34(15):6441–6457, https://doi.org/10.1175/JCLI-D-20-0746.1

[96] 2021. Borkotoky SS, **Williams AP**, Steinschneider S, Cook ER. Reconstructing extreme precipitation in the Sacramento River watershed using tree-ring based proxies of cold-season precipitation. *Water Resources Research* 57(4):e2020WR028824, https://doi.org/10.1029/2020WR028824

[95] 2021. Gaglioti BV, Berner LT, Jones BM, Orndahl K, **Williams AP**, Andreu-Hayles L, D'Arrigo RD, Goetz SJ, Mann DH. Tussocks enduring or shrubs greening: Alternate responses to changing fire regimes in the Noatak River Valley, Alaska. *JGR–*Biogeosciences 126(4):e2020JG006009, https://doi.org/10.1029/2020JG006009

[94] 2021. McDermid SS, Cook I, De Kauwe MG, Mankin J, Smerdon JE, **Williams AP**, Seager R, Puma MJ, Aleinov I, Kelley M, Nazarenko L. Disentangling the regional climate impacts of competing vegetation responses to elevated atmospheric CO_2. *JGR-Atmospheres* 125(5):e2020JD034108, https://doi.org/10.1029/2020JD034108

[93] 2021. **Williams AP**, Anchukaitis KJ, Woodhouse CA, Meko DM, Cook BI, Bolles K, Coon ER. Tree rings and observations suggest no stable cycles in Sierra Nevada cool-season precipitation. *Water Resources Research* 57(3):e2020WR028599, https://doi.org/10.1029/2020WR028599

[92] 2021. Bolles K, **Williams AP**, Cook ER, Cook BI, Bishop DA. Tree-ring reconstruction of the atmospheric ridging feature that causes flash drought in the central United States since 1500. *Geophysical Research Letters* 48(4):e2020GL091271, https://doi.org/10.1029/2020GL091271

[91] 2021. Baek SH, Smerdon JE, Cook BI, **Williams AP**. US Pacific coastal droughts are predominantly driven by internal atmospheric variability. *Journal of Climate* 34(5):1947–1962, https://doi.org/10.1175/JCLI-D-20-0365.1

[90] 2021. Zhou S, **Williams AP**, Lintner BR, Berg AM, Zhang Y, Keenan TF, Cook BI, Hagemann S, Seneviratne S, Gentine P. Soil moisture-atmosphere feedbacks mitigate projected surface water availability declines in drylands. *Nature Climate Change* 11:38–44, https://doi.org/10.1038/s41558-020-00945-z

[89] 2021. Abatzoglou JT, Juang CS, **Williams AP**, Kolden CA, Westerling AL. Increasing synchronous fire danger in forests of the western United States. *Geophysical Research Letters* 48(2):e2020GL091377, https://doi.org/10.1029/2020GL091377

[88] 2021. Hansen WD, Fitzimmons R, Olnes J, **Williams AP**. Assessing resilience of an alternate vegetation type following forest conversion in the boreal biome. *Journal of Ecology* 109(1):85–98, https://doi.org/10.1111/1365-2745.13446

[87] 2020. Dye AW, Rastogi B, Clemesha REW, Kim JB, Samelson RM, Still CJ, **Williams AP**. Spatial patterns and trends of summertime low cloudiness for the Pacific Northwest, 1997-2017. *Geophysical Research Letters* 46(16): e2020GL088121, https://doi.org/10.1029/2020GL088121

[86] 2020. Cook BI, McDermid S, Puma M, **Williams AP**, Seager R, Kelley M, Nazarenko L, Aleinov I. Divergent regional climate consequences of maintaining current irrigation rates. *JGR-Atmospheres* 125(114):e2019JD031814, https://doi.org/10.1029/2019JD031814

[85] 2020. Morales MS, Cook ER, Barichivich J, Christie DA, Villalba R, LeQuesne C, Srur AM, Ferrero ME, Gonzalez-Reyes A, Couvreax F, Matskovsky V, Aravena JC, Lara A, Mundo IA, Rojas F, Prieto MR, Smerdon JE, Bianchi LO, Masiokas MH, Urrutia R, Muñoz AA, Rodriguez-Caton M, Rojas-Badilla M, Alvarez C, Lopez L, Luckman B, Lister D, Harris I, Jones PD, **Williams AP**, Velazquez G, Aliste D, Aguilera-Betti I, Marcotti E, Flores F, Muñoz T, Cuq E, Boninsegna JA. Six hundred years of South American tree rings reveal in increase in severe hydroclimatic events since the mid-20th century. *Proceedings of the National Academy of Sciences USA* 117(29):16816–16823, https://doi.org/10.1073/pnas.2002411117

[84] 2020. Zhang Y, Commane R, Zhou S, **Williams AP**, Gentine P. Light limitation regulates the response of autumn terrestrial carbon uptake to warming. *Nature Climate Change* 10:739–743, https://doi.org/10.1038/s41558-020-0806-0

[83] 2020. Cook BI, Mankin JS, Marvel KM, **Williams AP**, Smerdon JE, Anchukaitis KJ. Twenty-first century drought projections from the CMIP6 forcing scenarios. *Earth's Future* 8(6):e2019EF001461, https://doi.org/10.1029/2019EF001461

[82] 2020. Rao K, **Williams AP**, Flefil JF, Konings AG. SAR-enhanced mapping of live fuel moisture content. *Remote Sensing of Environment* 245:111797, https://doi.org/10.1016/j.rse.2020.111797

[81] 2020. **Williams AP**, Cook ER, Smerdon JE, Cook BI, Abatzoglou JT, Bolles K, Baek SH, Badger A, Livneh B. Large contribution from anthropogenic warming to an emerging North American megadrought. *Science* 368:314–318, https://doi.org/10.1126/science.aaz9600

[80] 2020. Zhang Y, Parazoo NC, **Williams AP**, Zhou S, Gentine P. Large and projected strengthening moisture limitation on end-of-season photosynthesis. *Proceedings of the National Academy of Sciences USA* 117(17):9216–9222, https://doi.org/10.1073/pnas.1914436117

[79] 2020. Goss M, Swain D, Sarhadi A, Kolden K, Abatzoglou J, **Williams AP**, Diffenbaugh N. Climate change is increasing the risk of extreme autumn wildfire conditions across California. *Environmental Research Letters*, https://doi.org/10.1088/1748-9326/ab83a7

[78] 2020. Baublitz C, Fiore A, Clifton O, Mao J, Li J, Correa G, Westervelt D, Horowitz, Paulot, **Williams AP**. Sensitivity to tropospheric ozone over the Southeast USA to dry deposition. *Geophysical Research Letters* 47(7):e2020GL087158, https://doi.org/10.1029/2020GL087158

[77] 2020. Gebrehiwot Gebbregeorgis E, Robertson I, Koprowski M, Zhou L, Gao P, **Williams AP**, Eshetu Z, Wils THG. Historical droughts recorded in the extended *Juniperus procera* ring-width chronology from the Ethiopian Highlands. *International Journal of Biometeorology*, https://doi.org/10.1007/s00484-020-01863-7

[76] 2020. Stahle DW, Cook ER, Burnette DJ, Torbenson MCA, Howard IM, Griffin D, Villanueva-Diaz J, Cook BI, **Williams AP**, Watson E, Sauchyn DJ, Pederson N, Woodhouse CA, Pederson GT, Meko D, Coulthard B, Crawford CJ. Dynamics, variability, and change in seasonal precipitation reconstructions for North America. *Journal of Climate* 33:3173–3195, https://doi.org/10.1175/JCLI-D-19-0270.1

[75] 2020. Turner MG, Calder JW, Cumming GS, Hughes TP, Jentsch A, LaDeau S, Lenton TM, Shuman BN, Turetsky MR, Ratajczak A, Williams JW, **Williams AP**, Carpenter SR. Climate change, ecosystems, and abrupt change: Science priorities. *Philosophical Transactions B* 375(1794):1–11, https://doi.org/10.1098/rstb.2019.0105

[74] 2019. Mankin JS, Seager R, Smerdon JE, Cook BI, **Williams AP**. Mid-latitude freshwater availability reduced by projected vegetation responses to climate change. *Nature Geoscience* 12:983–988, https://doi.org/10.1038/s41561-019-0480-x

[73] 2019. Cavanaugh KC, Dangremond EM, Doughty CL, **Williams AP**, Parker JD, Hayes MA, Rodriguez W, Feller IC. 250 years of climate-driven regime shifts in a mangrove-saltmarsh ecotone. *Proceedings of the National Academy of Sciences USA*, 16(43):21602–21608, https://doi.org/10.1073/pnas.1902181116

[72] 2019. Zhou S, **Williams AP**, Zhang Y, Berg AM, Cook BI, Hagemann S, Lorenz R, Seneviratne SI, Gentine P. Land-atmosphere feedbacks exacerbate compound soil drought and atmospheric aridity. *Proceedings of the National Academy of Sciences USA* 116(38):18848–18853, https://doi.org/10.1073/pnas.1904955116

[71] 2019. **Williams AP**, Abatzoglou JT, Gershunov A, Guzman-Moralez J, Bishop DA, Balch JK, Lettenmaier DP. Observed impacts of anthropogenic climate change on wildfire in California. *Earth's Future* 7(8):892–910, https://doi.org/10.1029/2019EF001210

[70] 2019. Bishop DA, **Williams AP**, Seager R. Increased fall precipitation in the southeastern US driven by higher-intensity, frontal precipitation. *Geophysical Research Letters* 46(14):8300–8309, https://doi.org/10.1029/2019GL083177

[69] 2019. Gaglioti BV, Mann DH, **Williams AP**, Wiles GC, Stoffel M, Oelkers R, Jones BM, Andreu-Hayles L. Traumatic resin ducts in Alaska mountain hemlock trees as a new proxy for past winter storminess. *Journal of Geophysical Research – Biogeosciences* 124(7):1923–1938, https://doi.org/10.1029/2018JG004849

[68] 2019. Cook BI, Seager R, **Williams AP**, Puma M, McDermid S, Kelley M, Zazarenko L. Climate change amplification of natural drought variability: the historic mid-twentieth century North American drought in a warmer world. *Journal of Climate* 32(17):5417–5436, https://doi.org/10.1175/JCLI-D-18-0832.1

[67] 2019. Steiger N, Smerdon J, Cook BI, Seager R, **Williams AP**, Cook ER. Oceanic and radiative forcing of medieval megadroughts in the American Southwest. *Science Advances* 5(7): eaax0087, https://doi.org/10.1126/sciadv.aax0087

[66] 2019. Rodriguez-Caton M, Villalba R, Srur A, **Williams AP**. Radial growth patterns associated with tree mortality in *Nothofagus pumilio* forest. *Forests* 10(6):489, https://doi.org/10.3390/f10060489

[65] 2019. Pascolini-Campbell M, Seager R, **Williams AP**, Cook BI, Pinson A. Dynamics and variability of the spring dry season in the United States Southwest as observed in AmeriFlux and NLDAS-2 data. *Journal of Hydrometeorology* 20:1081–1102, https://doi.org/10.1175/JHM-D-18-0154.1

[64] 2019. Marvel K, Cook BI, Bonfils C, Durack PJ, Smerdon JE, **Williams AP**. Twentieth-century hydroclimate changes consistent with human influence. *Nature* 569:59–65, https://doi.org/10.1038/s41586-019-1149-8

[63] 2019. Dong C, MacDonald GM, Willis K, Gillespie T, Okin GS, **Williams AP**. Vegetation responses to 2012-2016 drought in northern and southern California. *Geophysical Research Letters* 46(7):3810–3821, https://doi.org/10.1029/2019GL082137

[62] 2019. Cook ER, Kushnir Y, Smerdon JE, **Williams AP**, Anchukaitis KJ, Wahl ER. A Euro-Mediterranean tree-ring reconstruction of the winter NAO index since 910 C.E. *Climate Dynamics* 53(3-4):1567–1580, https://doi.org/10.1007/s00382-019-04696-2
[61] 2019. Baek SH, Smerdon JE, Seager R, **Williams AP**, Cook BI. Pacific Ocean forcing and atmospheric variability are the dominant causes of spatially widespread droughts in the contiguous United States. *Journal of Geophysical Research – Atmospheres* 124(5):2507–2524, https://doi.org/10.1029/2018JD029219
[60] 2019. Duffy PB, Field CB, Diffenbaugh NS, Doney SC, Dutton Z, Goodman S, Heinzerling L, Hsiang S, Lobell DB, Mickley LJ, Myers S, Natali SM, Parmesan C, Tierney S, **Williams AP**. Strengthened scientific support for the Endangerment Finding for atmospheric greenhouse gases. *Science* 363(6427):eaat5982, https://doi.org/10.1126/science.aat5982
[59] 2019. Levesque M, Andreu-Hayles L, Smith WK, **Williams AP**, Hobi ML, Pederson N. Tree-ring isotopes capture interannual vegetation productivity dynamics at the biome scale. *Nature Communications* 10:742, https://doi.org/10.1038/s41467-019-08634-y
[58] 2019. Riley KL, **Williams AP**, Urbanski SP, Calkin DE, Short KC, O'Conor CD. Will landscape fire increase in the future? A systems approach to climate, fire, fuel, and human drivers. *Current Pollution Reports*, https://doi.org/10.1007/s40726-019-0103-6
[57] 2019. Abatzoglou JT, **Williams AP**, Barbero R. Global emergence of anthropogenic climate change in fire weather indices. *Geophysical Research Letters* 46(1):326–336, https://doi.org/10.1029/2018GL080959
[56] 2019. Zhou S, Zhang Y, **Williams AP**, Gentine P. Projected increases in intensity, frequency, and terrestrial carbon costs of compound drought and aridity events. *Science Advances* 5(1):eaau5740, https://doi.org/10.1126/sciadv.aau5740
[55] 2019. Bishop DA, **Williams AP**, Seager R, Fiore AM, Cook BI, Mankin JS, Singh D, Smerdon JE, Rao MP. Investigating the causes of increased twentieth-century fall precipitation over the southeastern United States. *Journal of Climate* 32:575–590, https://doi.org/10.1175/JCLI-D-18-0244.1
[54] 2019. Law DJ, Adams HD, Breshears DD, Cobb NS, Bradford JB, Zou CB, Field JP, Gardea AA, **Williams AP**, Huxman TE. Bioclimatic envelopes for individual demographic events driven by extremes: plant mortality from drought and warming. *International Journal of Plant Sciences*, 180(1):53–62, https://doi.org/10.1086/700702
[53] 2018. Cook BI, **Williams AP**, Smerdon JE, Palmer J, Cook ER, Stahle DW, Coats S. Cold tropical Pacific sea surface temperatures during the late sixteenth century North American megadrought. *Journal of Geophysical Research – Atmospheres* 123(20):11307–11320, https://doi.org/10.1029/2018JD029323
[52] 2018. Herrera-Hernandez DA, Ault TR, Fasullo JT, Coats SJ, Carillo CM, Cook BI, **Williams AP**. Exacerbation of the 2013–2016 Pan-Caribbean drought by anthropogenic warming. *Geophysical Research Letters* 45(19):10619–10626, https://doi.org/10.1029/2018GL079408
[51] 2018. Bedsworth L, Cayan D, Franco G, Fisher L, Ziaja S. (I was 1 of 45 Contributing Authors) California's Fourth Climate Change Assessment, Statewide Summary Report. http://www.climateassessment.ca.gov/state/docs/20190116-StatewideSummary.pdf
[50] 2018. Abatzoglou JT, **Williams AP**, Boschetti L, Zubkova M, Kolden CA. Global patterns of interannual climate-fire relationships. *Global Change Biology* 24(11):5164–5175, https://doi.org/10.1111/gcb.14405

[49] 2018. **Williams AP**, Gentine P, Moritz MA, Roberts DA, Abatzoglou JT. Effect of reduced summer cloud shading on evaporative demand and wildfire in coastal southern California. *Geophysical Research Letters* 45(11):5653–5662, https://doi.org/10.1029/2018GL077319

[48] 2018. Steinschneider S, Ho M, **Williams AP**, Cook ER, Lall U. A 500-year paleoclimate reconstruction of extreme cold-season precipitation and atmospheric river storm tracks across the Southwestern U.S. *Geophysical Research Letters* 45(11):5672-5680, https://doi.org/10.1029/2018GL078089

[47] 2018. Balch JK, Schoennagel T, **Williams AP**, Abatzoglou JT, Cattau ME, Mietkiewicz NP, St. Denis LA. Switching on the big burn of 2017 in the U.S. *Fire* 1(1):17, https://doi.org/10.3390/fire1010017

[46] 2018. Mankin JS, Smerdon JE, Cook BI, **Williams AP**, Horton RM, Seager R. Blue water tradeoffs with ecosystems in a CO_2-enriched climate. *Geophysical Research Letters* 45(7):3115–3125, https://doi.org/10.1002/2018GL077051

[45] 2018. Seager R, Lis N, Feldman J, Ting M, **Williams AP**, Nakamura J, Liu H. Whither the 100th Meridian? The once and future physical and human geography of America's arid-humid divide: Part I: The story so far. *Earth Interactions* 22(5):1–22, https://doi.org/10.1175/EI-D-17-0011.1

[44] 2018. Seager R, Feldman J, Lis N, Ting M, **Williams AP**, Nakamura J, Liu H. Whither the 100th Meridian? The once and future physical and human geography of America's arid-humid divide: Part II: The meridian moves east. *Earth Interactions* 22(5):1–24, https://doi.org/10.1175/EI-D-17-0012.1

[43] 2018. Stephenson NL, Das AJ, Ampersee N, Cahill K, Caprio A, Sanders J, **Williams AP**. Patterns and correlates of giant sequoia foliage dieback during California's 2012-2016 hotter drought. *Forest Ecology and Management* 419-420:268–278, https://doi.org/10.1016/j.foreco.2017.10.053

[42] 2018. Cook BI, **Williams AP**, Seager R, Smerdon JE, Singh D, Mankin J. Revisiting the precipitation dipole in western North America and its importance for Pacific coastal droughts in the United States. *Journal of Climate* 31:25–43, https://doi.org/10.1175/JCLI-D-17-0172.1

[41] 2017. **Williams AP**, Cook BI, Smerdon J, Bishop DA, Seager R, Mankin JS. The 2016 southeastern US drought: an extreme departure from centennial wetting and cooling. *Journal of Geophysical Research – Atmospheres* 122(20):10888–10905, https://doi.org/10.1002/2017JD027523

[40] 2017. Hydro2k Consortium (Smerdon JE, et al.). Comparing proxy and model estimates of hydroclimate variability and change over the Common Era. *Climate of the Past*, 13:1851–1900, https://doi.org/10.5194/cp-13-1851-2017

[39] 2017. Mankin JS, Smerdon JE, Cook BI, **Williams AP**, Seager R. The curious case of projected 21st-century drying but greening in the American West. *Journal of Climate* 30(21):8689–8710, https://doi.org/10.1175/JCLI-D-17-0213.1

[38] 2017. Wang K, **Williams AP**, Lettenmaier D. How much have California winters warmed over the last century? *Geophysical Research Letters* 44(17):8893–8900, https://doi.org/10.1002/2017RL075002

[37] 2017. Baek SH, Smerdon JE, Coats S, **Williams AP**, Cook BI, Cook ER, Seager R. Precipitation, temperature, and teleconnection signals across the combined North

American, Monsoon Asia, and Old World Drought Atlases. *Journal of Climate* 30:7141–7155, https://doi.org/10.1175/JCLI-D-16-0766.1

[36] 2017. McCullough IM, Davis FW, **Williams AP**. A range of possibilities: assessing geographic variation in climate sensitivity of ponderosa pine using tree rings. *Forest Ecology and Management* 402:223–233, https://doi.org/10.1016/j.foreco.2017.07.025

[35] 2017. Abatzoglou JT, Kolden C, **Williams AP**, Lutz J, Smith A. Climatic influences on interannual variability in regional burn severity across western US forests. *International Journal of Wildland Fire* 26(4):269–275, https://doi.org/10.1071/WF16165

[34] 2017. Konnings AG, **Williams AP**, Gentine P. Sensitivity of grassland productivity to aridity is controlled by plant hydraulics. *Nature Geoscience* 10:284–288, https://doi.org/10.1038/ngeo2903

[33] 2016. Abatzoglou JT, **Williams AP**. Impact of anthropogenic climate change on wildfire across western US forests. *Proceedings of the National Academy of Sciences USA* 113(42):11770–11775, https://doi.org/10.1073.pnas.1607171113

[32] 2016. Fischer DT, Still CJ, Ebert C, Baguskas S, **Williams AP**. Fog drip maintains dry season ecological function in a California coastal pine forest. *Ecosphere* 7(6):e01364, https://doi.org/10.1002/ecs2.1364

[31] 2016. Xu C, Liu H, **Williams AP**, Yin Y, Wu X. Trends toward an earlier peak of the growing season in northern hemisphere mid-latitudes. *Global Change Biology* 22(8):2852–2860, https://doi.org/10.1111/gcb.13224

[30] 2016. Rastogi B, **Williams AP**, Fischer DT, Iacobellis S, McEachern K, Carvalho LMV, Jones C, Baguskas SA, Still CJ. Spatial and temporal patterns of cloud cover and fog inundation in coastal California: Ecological implications. *Earth Interactions* 20(15):1–19, https://doi.org/10.1175/EI-D-15-0033.1

[29] 2016. Cook BI, Cook ER, Smerdon JE, Seager R, **Williams AP**, Coats S, Stahle DW, Villanueva-Diaz J. North American Megadroughts in the Common Era: Reconstructions and Simulations. *WIREs Climate Change* 7(3):411–432, https://doi.org/10.1002/wcc.394

[28] 2016. **Williams AP**, Abatzoglou JT. Recent advances and remaining uncertainties in resolving past and future climate effects on global fire activity. *Current Climate Change Reports* 2(1):1–14, https://doi.org/10.1007/s40641-016-0031-0

[27] 2016. Clemsha RES, Gershunov A, Iacobellis S, **Williams AP**, Cayan D. The northward march of summer low cloudiness along the California coast. *Geophysical Research Letters* 43(3):1287–1295, https://doi.org/10.1002/2015GL067081

[26] 2016. Mcdowell NG, **Williams AP**, Xu C, Pockman WT, Dickman LT, Sevanto S, Pangle R, Limousin J, Plaut J, Mackay DS, Ogee J, Domec JC, Allen CD, Fisher RA, Jiang X, Muss JD, Breshears DD, Rauscher SA, Koven C. Multi-scale predictions of massive conifer mortality due to chronic temperature rise. *Nature Climate Change* 6:295–300, https://doi.org/10.1038/nclimate2873

[25] 2015. Rauscher SA, Jiang X, Steiner A, **Williams AP**, Cai MD, McDowell NG. Sea surface warming patterns drive future vegetation change. *Journal of Climate* 28(20):7943–7961, https://doi.org/10.1175/JCLI-D-14-00528.1

[24] 2015. **Williams AP**, Seager R, Abatzoglou JT, Cook BI, Smerdon JE, Cook ER. Contribution of anthropogenic warming to California drought during 2012–2014. *Geophysical Research Letters* 42(16):6819–6828, https://doi.org/10.1002/2015GL064924

[23] 2015. Anderegg WRL, Schwalm C, Biondi F, Camarero JJ, Koch G, Litvak M, Ogle K, Shaw JD, Shevliakova E, **Williams AP**, Wolf A, Pacala S. Pervasive drought legacies in

forest ecosystems and their implications for carbon cycle models. *Science* 349(6247):528–532, https://doi.org/10.1126/science.aab1833

[22] 2015. Seager R, Hooks A, **Williams AP**, Cook BI, Nakamura J, Henderson N. Climatology, variability and trends in United States vapor pressure deficit, an important fire-related meteorological quantity. *Journal of Applied Meteorology and Climatology* 54(6):1121–1141, https://doi.org/10.1175/JAMC-D-14-0321.1

[21] 2015. **Williams AP**, Schwartz RE, Iacobellis S, Seager R, Cook BI, Still CJ, Husak G, Michaelsen J. Urbanization causes increased cloud-base height and decreased fog in coastal southern California. *Geophysical Research Letters* 42(5):1527–1536, https://doi.org/10.1002/2015GL063266

[20] 2015. Cavanaugh KC, Parker JD, Cook-Patton SC, Feller IC, **Williams AP**, Kellner JR. Integrating physiological threshold experiments with climate modeling to project mangrove species' range expansion. *Global Change Biology* 21(5):1928–1938, https://doi.org/10.1111/gcb.12843

[19] 2015. McDowell NG, Coops NC, Beck P, Chambers J, Gangodagamage C, Hicke JA, Huang C, Kennedy R, Krofcheck D, Litvak M, Meddens A, Muss J, Negrón-Juarez R, Peng C, Schwantes A, Swenson JJ, Vernon L, **Williams AP**, Xu C, Zhao M, Running S, Allen CD. Global satellite monitoring of climate-induced vegetation disturbances. *Trends in Plant Science* 20(2):114–123, https://doi.org/10.1016/j.tplants.2014.10.008

[18] 2015. **Williams AP**, Seager R, Macalady AK, Berkelhammer M, Crimmins M, Swetnam TW, Trugman AT, Buenning N, Noone D, McDowell NG, Hryniw N, Mora CI, Rahn T. Correlations between components of the water balance and burned area reveal new insights for predicting forest-fire area in the southwest United States. *International Journal of Wildland Fire* 24(1):14–26, https://doi.org/10.1071/WF14023

[17] 2014. **Williams AP**, Seager R, Berkelhammer M, Macalady AK, Crimmins M, Swetnam TW, Trugman AT, Buenning N, Hryniw N, McDowell NG, Noone D, Mora CI, Rahn T. Causes and implications of extreme atmospheric moisture demand during the record-breaking 2011 wildfire season in the southwest United States. *Journal of Applied Meteorology and Climatology* 53(12):2671–2684, https://doi.org/10.1175/JAMC-D-14-0053.1.

[16] 2013. Adams HD, **Williams AP**, Xu C, Rauscher SA, Jiang X, McDowell NG. Empirical and process-based approaches to forest mortality models. *Frontiers in Plant Science* 4:438, https://doi.org/10.3389/fpls.2013.00438

[15] 2013. McDowell NG, Fischer RA, Xu C, Domec JC, Hölttä T, Mackay DS, Sperry JS, Boutz A, Dickman L, Gehres N, Limousin JM, Macalady A, Martinez-Vilálta J, Mencuccini M, Plaut JA, Ogee J, Pangle RE, Rasse DP, Ryan MG, Sevanto S, Waring R, **Williams AP**, Yepez EA, Pockman WT. Tansley Review: Evaluating theories of drought-induced vegetation mortality using a multi-model-experiment framework. *New Phytologist* 200:304–321, https://doi.org/10.1111/nph.12465

[14] 2013. Breshears DD, Adams HD, Eamus D, McDowell NG, Law DJ, Will RE, **Williams AP**, Zou C. The critical amplifying role of increasing atmospheric moisture demand on future tree mortality and associated regional die-off. *Frontiers in Plant Science* 4:266, https://doi.org/10.3389/fpls.2013.00266

[13] 2013. Liu H, **Williams AP**, Allen CD, Guo D, Wu X, Anenkhonov OA, Liang E, Qi Z, Sandanov DV, Korolyuk AY, Badmaeva NK. Rapid warming accelerates tree growth

decline in semi-arid forests in Inner Asia. *Global Change Biology* 19:2500–2510, https://doi.org/10.1111/gcb.12217

[12] 2013. Jiang X, Rauscher SA, Ringler TD, McDowell NG, Lawrence D, **Williams AP**, Cai M. Increasing risk of tree mortality in western North America towards the end of the 21st century. *Journal of Climate* 26:3671–3687, https://doi.org/10.1175/JCLI-D-12-00430.1

[11] 2013. **Williams AP**, Allen CD, Macalady AK, Woodhouse C, Meko D, Swetnam TW, Cook ER, Griffin D, Rauscher SA, Seager R, Dean J, Grissino-Mayer HD, Gangodagamage C, Cai M, McDowell N. Article: Temperature as a potent driver of regional forest-drought stress and tree mortality. *Nature Climate Change* 3:292–297, https://doi.org/10.1038/nclimate1693

[10] 2013. Carbone MS, **Williams AP**, Ambrose AR, Bradley E, Boot CM, Dawson TE, Schaeffer SM, Schimel JP, Still CJ. Cloud shading and fog drip influence the metabolism of a coastal pine ecosystem. *Global Change Biology* 19:484–497, https://doi.org/10.1111/gcb.12054

[9] 2012. **Williams AP**, Funk C, Michaelsen J, Rauscher SA, Robertson I, Wils T, Koprowski M, Eshetu Z, Loader N. Recent summer precipitation trends in the Greater Horn of Africa and the emerging role of Indian Ocean sea surface temperature. *Climate Dynamics* 39:2307–2328, https://doi.org/10.1007/s00382-011-1222-y

[8] 2012. Marshall M, Tu K, Funk C, Michaelsen J, **Williams AP**, Williams C, Ardo J, Marie B, Cappelaere B, Grandcourt A, Nickless A, Nouvellon Y, Scholes R, Wutsch W. Combining surface reanalysis and remote sensing data for monitoring evapotranspiration, *Hydrology and Earth System Sciences* 9:1547–1587, https://doi.org/10.5194/hessd-9-1547-2012

[7] 2011. **Williams AP**, Funk C. A westward extension of the warm pool intensifies the Walker circulation, drying eastern Africa. *Climate Dynamics* 37:2417–2435, https://doi.org/10.1007/s00382-010-0984-y

[6] 2011. **Williams AP**, Xu C, McDowell NG. Who is the new sheriff in town regulating boreal forest growth? *Environmental Research Letters* 6, https://doi.org/10.1088/1748-9326/6/4/041004

[5] 2011. Carbone MS, Ambrose A, Dawson TE, **Williams AP**, Boot CM, Schaeffer SM, Schimel JP, Still CJ. Seasonal and episodic moisture controls on plant and microbial contributions to soil respiration. *Oecologia* 167:265–278, https://doi.org/10.1007/s00442-011-1975-3

[4] 2010. **Williams AP**, Allen CD, Millar C, Swetnam T, Michaelsen J, Still CJ, Leavitt SW. Forest responses to increasing aridity and warmth in southwestern North America. *Proceedings of the National Academy of Sciences USA* 107:21289–21294, https://doi.org/10.1073/pnas.0914211107

[3] 2010. **Williams AP**, Michaelsen, Leavitt SW, Still CJ. Using tree-rings to predict the response of tree growth to climate change in the continental United States during the 21st century. *Earth Interactions* 14:1–20, https://doi.org/10.1175/2010EI362.1

[2] 2009. Fischer DT, Still CJ, **Williams AP**. Significance of summer fog and overcast for drought stress and ecological functioning of coastal California endemic plant species. *Journal of Biogeography* 36:783–799, https://doi.org/10.1111/j.1365-2699.2008.02025.x

[1] 2008. **Williams AP,** Still CJ, Fischer DT, Leavitt SW. The influence of summertime fog and overcast clouds on the growth of a coastal Californian pine: a tree-ring study. *Oecologia* 156:601–611, https://doi.org/10.1007/s00442-008-1025-y

Other Publications

2021. **Williams AP**, Cook BI, Smerdon JE. How severe is the megadrought in the West? The Hill. https://thehill.com/opinion/energy-environment/564591-how-severe-is-the-megadrought-in-the-west

2021. Rao K, Diffenbaugh NS, Konings AG, Yerba M, **Williams AP**. Dry Vegetation in California as it Braces for 2021 Wildfires. *EARTH.ORG*. https://earth.org/data_visualization/california-2021-wildfire-season

2019. Mankin JT, Seager R, Smerdon JE, Cook BI, **Williams AP**. Will plants help make the planet wetter or drier in a changing climate? *Carbon Brief*. https://www.carbonbrief.org/guest-post-will-plants-help-make-the-planet-wetter-or-drier-in-a-changing-climate?

2018. Field RD, Fernandes K, Glover KC, Hansen WD, Rabinowicz J, **Williams AP**. Understanding the roles of fuels, climate and people in predicting fire: taking the long view. *PAGES Magazine* 26(1):41, https://10.22498/pages.26.1.41.

2015. **Williams AP**. How much has global warming worsened California's drought? Now we have a number. *The Conversation*. https://theconversation.com/how-much-has-global-warming-worsened-californias-drought-now-we-have-a-number-46445

2015. **Williams AP**. Megadroughts. *Academic Minute: A WAMC National Production*. https://academicminute.org/2015/05/a-park-williams-columbia-university-megadroughts/

2011. **Williams AP**. Forest responses to warming on the Sky Islands of the southwestern United States. *Mountain Views* 5(1):24–28. http://www.fs.fed.us/psw/cirmount/publications/pdf/Mtn_Views_mar_11.pdf

2010. **Williams AP**, Funk C. A westward extension of the tropical Pacific warm pool leads to March through June drying in Ethiopia and Kenya. *USGS Open-File Report*. http://pubs.usgs.gov/of/2010/1199/

Professional Presentations

2021 September. Understanding the observed increase in western US wildfire activity over the past four decades. Invited talk at the UCLA Law School Faculty Workshop, Los Angeles, CA.

2021 May. Impact of anthropogenic warming on an emerging North American megadrought. Invited virtual seminar for NASA Goddard Hydrological Sciences Laboratory.

2021 April. Understanding the observed increase in western US wildfire activity over the past four decades. Invited virtual seminar for the Department of Earth and Planetary Sciences department at Harvard University. https://harvard.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=0351d500-89dd-4380-8649-ad080123058f

2021 January. Understanding the observed increase in western US wildfire activity over the past four decades. Invited virtual seminar for the California Fire Science Seminar Series, hosted by the Fire Research Group at UC Berkeley and UC Merced. https://www.youtube.com/watch?v=7lDyCjXbkQM

2021 January. Impact of anthropogenic warming on an emerging North American megadrought. Invited virtual seminar for UC Berkeley Atmospheric Sciences Center seminar series.

2020 September. On Fire: The Escalating Consequences of a Warming Climate. Public webinar hosted by Columbia University's Earth Institute. https://www.youtube.com/watch?v=Oca9231Msew

2020 May. Impact of anthropogenic warming on an emerging North American megadrought. Invited national-scale webinar for the NOAA National Integrated Drought Information System. www.youtube.com/watch?v=VKxa_fWMguU

2020 March. Wildfire modeling in the western United States. Invited speaker at the Lamont Advisory Board Meeting, Lamont-Doherty Earth Observatory of Columbia University. Palisades, NY.

2020 February. Large contribution from anthropogenic warming to an emerging North American megadrought. Invited seminar for the Center for Ecosystem Science and Society and the School of Informatics, Computing, and Cyber Systems at the Northern Arizona University. Flagstaff, AZ.

2020 February. Large contribution from anthropogenic warming to an emerging North American megadrought. Invited seminar for the Laboratory of Tree Ring Research at the University of Arizona. Tucson, AZ.

2020 January. Large contribution from anthropogenic warming to an emerging North American megadrought. Invited seminar for the Geography Department at UCLA. Los Angeles, CA.

2020 January. Large contribution from anthropogenic warming to an emerging North American megadrought. Invited seminar for the Biology and Paleo Environment division at the Lamont-Doherty Earth Observatory of Columbia University. Palisades, NY.

2019 December. A 1200-year perspective on modern high- and low-frequency variability in California's Sierra Nevada cold-season precipitation using tree rings. Fall meeting of the American Geophysical Union – San Francisco, CA.

2019 November. Large contribution from anthropogenic warming to an emerging North American megadrought. Invited talk at the Healthy Forests, Healthy Watersheds Workshop at the University of Arizona. Tucson, AZ.

2019 September. Combining modern observations with clues from Earth's past to understand climate change, drought, and wildfire. Invited talk for the Columbia University Earth Institute's Climate Task Force. New York, NY.

2019 September. Wildfire, megadrought, and climate change in western North America. Lecture for the Harvard Atmospheric and Environmental Chemistry Seminar Series. Harvard University. Cambridge, MA.

2019 May. Wildfires. Invited talk at Columbia University's Workshop on Correlated Extremes. New York, NY.

2019 May. Understanding Sierra Nevada cool season precipitation from tree-ring reconstructions. Invited talk at the annual meeting on precipitation forecasting of the Western States Water Council. San Diego, CA.

2019 April. Climate change, wildfire, and megadrought. Invited public lecture for the Climate Change Education Seminar Series, hosted by the New Mexico State University. Las Cruces, NM.

2019 January. Paleoclimate: Using clues left behind by nature to tell the story of Earth's past. Invited workshop for local high school students at the New York City Department of Education's Youth Climate Summit. New York, NY.

2018 December. Twenty-first century megadrought in western North America: millennial context and anthropogenic contributions. Fall meeting of the American Geophysical Union – Washington, DC.

2018 December. The United States' wildfire problem. Invited talk at the Columbia University Earth Institute Faculty Meeting – New York, NY.
2018 October. Wildfire, megadrought, and the role of humans. Invited lecture for an outreach event hosted by Alex Halliday, director of the Columbia University Earth Institute – New York, NY.
2018 October. Wildfire, megadrought, and the role of humans. Invited lecture at the Earth Institute Practicum at Columbia University – New York, NY.
2018 October. Wildfire. Invited talk for Prudential, Lamont-Doherty Earth Observatory of Columbia University – Palisades, NY.
2018 October. Climate change, drought, and fire. Invited lecture at the annual Open House at the Lamont-Doherty Earth Observatory of Columbia University – Palisades, NY.
2018 September. Progress toward improved continental drought reconstruction. NSF project meeting, University of Albany – Albany, NY.
2018 September. Is western North America in a megadrought? Invited talk at an informal science brain-storming week hosted by Dr. Edward Cook – Rufina, Italy.
2018 August. Effect of reduced summer cloud shading on evaporative demand and wildfire in coastal southern California. Invited talk at the annual meeting of the Ecological Society of America – New Orleans, LA.
2018 May. Anthropogenic and natural influences on drought and fire in the western United States. Seminar at Oregon State University – Corvallis, OR.
2018 May. Effect of cloud cover reductions on aridity and fire danger in coastal California. Invited talk at the Fire Continuum Conference – Missoula, MT.
2018 May. Predictability of drought and its impacts, Invited talk for the Greenwich Retired Men's Association's speaker series on Food, Water, Shelter, and Energy – Greenwich, CT.
2018 April. Wildfire: A critical component of the coupled Earth system. Invited talk at the Land Atmosphere Interactions and Extremes Workshop within the 2018 US Climate Modeling Summit, University of Maryland – College Park, MD.
2018 March. The 2016 southeastern US drought: an extreme departure from centennial wetting and cooling. Invited talk for the monthly telecom for the National Land Data Assimilation System.
2018 February. Anthropogenic and natural influences on drought and fire in the western United States. Environmental Sciences Seminar Series, University of California, Merced – Merced, CA.
2018 February. Anthropogenic and natural influences on drought and fire in the western United States. Colloquium for the Department of Atmospheric and Environmental Sciences, University at Albany – Albany, NY.
2017 December. The 2016 southeastern US drought: an extreme departure from centennial wetting and cooling. Invited presentation at the 2017 fall meeting of the American Geophysical Union – New Orleans, LA.
2017 December. Humans, global climate change, and wildfire. Invited public lecture for Brooklyn Public Library's Green Series – Brooklyn, NY.
2017 October. Recent work on climate-induced changes in fire risk in the Southeastern US and coastal California. Presentation for the lab group of Dr. Jennifer Balch at the University of Colorado – Boulder, CO.

2017 September. Effects of human-caused climate change and forest management on fire in the western United States and beyond. Invited lecture at the Earth Institute Practicum at Columbia University – New York, NY.
2017 August. Human-caused warming, natural climate variability, and forest fire in the western United States. Invited talk at the annual meeting of the Ecological Society of America – Portland, OR.
2017 June. Research on water resources at the Lamont-Doherty Earth Observatory. Special presentation for the Columbia University Center for Climate and Life – Palisades, NY.
2017 May. Drought and wildfire in the western United States: implications for Chile. Meeting for the South American Drought Atlas. Laboratorio de Dendrocronología y Cambio Global, Universidad Austral de Chile – Valdivia, Chile.
2017 May. Drought and wildfire in the western United States: implications for Chile. Invited lecture at the Pontificia Universidad Católica de Valparaíso – Valparaíso, Chile.
2017 May. Drought and wildfire in the western United States: implications for Chile. Panel speaker at a seminar on the future of forests and glaciers in Chile. Columbia University's Global Center in Chile – Santiago, Chile.
2017 May. Recent work studying southeast US drought, and connections to upcoming work in South America. Columbia University's Earth Institute Faculty Meeting – Palisades, NY.
2017 May. Recent work studying southeast US drought, and connections to upcoming work in South America. Columbia University's Earth Institute Faculty Meeting – Palisades, NY.
2017 May. Causes and consequences of drought. Developmental Review at the Lamont-Doherty Earth Observatory of Columbia University – Palisades, NY.
2017 May. Recent work studying southeast US drought, and connections to upcoming work in South America. Columbia University's Earth Institute Faculty Meeting – Palisades, NY.
2017 April. The impact of human-caused warming on drought and forest fire in the western US. Systems Ecology Seminar Series, University of Montana – Missoula, MT.
2017 February. The impact of human-caused warming on drought and forest fire in the western US, and an evaluation of the fall 2016 drought in the Southeast US. Seminar for the Ocean & Climate Physics division at the Lamont-Doherty Earth Observatory, Columbia University – Palisades, NY.
2017 January. The impact of human-caused warming on drought and forest fire in the western United States. Colloquium for the Carnegie Ecology Seminar, Stanford University – Palo Alto, CA.
2016 October. The impact of human-caused warming on drought and fire in the western United States. Invited lecture at the annual Open House Event at the Lamont-Doherty Earth Observatory of Columbia University – Palisades, NY.
2016 February. How climate and humans shape drought impacts in the western United States. Colloquium for the Earth & Environmental Sciences Department at the University of Illinois, Chicago – Chicago, IL.
2016 February. Drought, vegetation, and wildfire: an overview. Tele-conference for the Bureau of Land Management's Division of Wildfire Predictive Services Division – Boise, ID.
2016 February. Contribution of human-caused warming to the recent California drought. Presentation for Arup, an independent engineering firm that works on global climate change adaptation and resilience – Palisades, NY.
2015 December. Certainties and uncertainties in the future of forest fire in the western United States. American Geophysical Union Meeting – San Francisco, CA.

2015 December. Contribution of anthropogenic warming to California drought during 2012-2015. Invited talk at the American Geophysical Union Meeting – San Francisco, CA.
2015 December. How climate and humans are shaping droughts in western North America. Presentation for the Director's Circle of the Lamont-Doherty Earth Observatory of Columbia University – New York, NY.
2015 December. How climate and humans shape drought in the western United States. Seminar for the Columbia University Department of Ecology, Evolution, and Environmental Biology – New York, NY.
2015 October. Drought, vegetation, and wildfire: an overview. Keynote speaker at a NIDIS workshop on Integrating Drought Science and Information with Wildfire Management – Boise, ID.
2015 May. A road trip through three states of drought, from the Southwestern forests to the Los Angeles Coast. Seminar for the UCLA Geography Department – Los Angeles, CA.
2015 April. Temperature is a potent driver of regional forest drought stress, disturbance, and tree mortality. University of Arkansas Geosciences Departmental Seminar – Fayetteville, AR.
2015 March. Decomposition of Thornthwaite and P-M PDSI into T and P contributions for CA up through the past winter. Drought Task Force monthly telecom – Hosted by Martin Hoerling, Boulder, CA.
2015 March. Urbanization causes increased cloud-base height and decreased fog in coastal southern California. Pacific Climate Meeting (PACLIM) – Pacific Grove, CA.
2014 September. Drought, forests, wildfire, and coastal fog in the Southwestern U.S. Seminar for the University of Delaware Geography Department – University of Delaware, Newark, DE.
2014 June. Temperature is a potent driver of regional forest drought stress, disturbance, and tree mortality. Guest Lecture for Columbia University's Graduate Program on Management Science and Engineering – Columbia University, New York.
2014 June. Climate controls on past and future summer fog and stratus cloudiness in coastal southern California. USGS webinar series on fog studies.
2014 February. Influence of Indian Ocean warming on atmospheric circulation and drought in the Horn of Africa. Seminar at Addis Ababa University – Addis Ababa, Ethiopia.
2014 January. Temperature is a potent driver of regional forest drought stress, disturbance, and tree mortality. Invited speaker at the 9th International Conference on Dendrocrhonology (WorldDendro) – Melbourne, Australia.
2013 December. Temperature is a potent driver of regional forest drought stress, disturbance, and tree mortality. Invited talk at the American Geophysical Union Meeting – San Francisco, CA.
2013 October. Temperature is a potent driver of regional forest drought stress, disturbance, and tree mortality. Invited talk at the 12th Biennial Conference of Science and Management on the Colorado Plateau – Flagstaff, AZ.
2013 September. Climate change and global forests. Invited dinner speaker at the Los Alamos National Laboratory's meeting of the Board of the Governors – Santa Fe, NM.
2013 September. Drought, climate change, and their ecological impacts. Invited seminar at the Lamont-Doherty Earth Observatory at Columbia University – Palisades, NY.

2013 August. Temperature is a potent driver of regional forest drought stress and tree mortality. Invited Speaker at the Ecological Society of America (ESA) meeting – Minneapolis, MN.
2013 July. Accelerating global forest mortality. Meeting of the Regents of the University of California – San Francisco, CA.
2013 June. The future of southwestern climate and forests. Presentation for a panel of external reviewers of the Los Alamos National Laboratory – Los Alamos, NM.
2013 April. The future of southwestern climate and forests. Sierra Club Climate Town Hall Meeting – Albuquerque, NM.
2013 March. Broad and diverse investigations into drought and its impacts. Los Alamos National Laboratory seminar for management – Los Alamos, NM.
2013 February. The future of southwestern forests. Albuquerque Rotary Club – Albuquerque, NM.
2013 January. Temperature as a potent driver of regional forest drought stress and tree mortality. Southwestern Wildfire Consortium – Santa Fe, NM.
2012 December. Climate controls on summer fog and stratus cloudiness in coastal southern California. Invited speaker at the American Geophysical Union Meeting – San Francisco, CA.
2012 November. How climate will change our forests. Los Alamos National Laboratory project review meeting – Los Alamos, NM.
2012 October. How climate will change our forests, and when. Department of Earth & Planetary Sciences Colloquium – University of New Mexico, Albuquerque, NM.
2012 October. How climate will change our forests, and when. Public lecture – Museum of Northern Arizona, Flagstaff, AZ.
2012 October. Temperature as a potent driver of forest drought stress and tree mortality. Mountain Climate Research Conference (MtnClim) – Estes Park, CO.
2012 September. Climate change and the rising cost of living for forests in the Southwestern United States. Southwest Climate Conference – Jemez Springs, NM.
2012 June. Climate change and the rising cost of living for forests in the Southwestern United States. Seminar for Los Alamos National Laboratory's Climate, Ocean and Sea Ice Modeling (COSIM) group – Los Alamos, NM.
2012 June. Temperature and atmospheric circulation effects on forests and society. Seminar for the Department Ecology and Conservation – University of Montana, Missoula.
2012 April. Climate change and the rising cost of living for forests in the Southwestern United States. Geography Department Colloquium – University of Wisconsin, La Crosse.
2012 March. Tree rings from USA Southwest foretell of forest declines under future climate. Santa Fe Watershed Climate Change Workshop – Santa Fe, NM.
2010 December. Forest responses to increasing aridity and warmth in southwestern North America. American Geophysical Union Meeting – San Francisco, CA.
2010 December. Forest responses to increasing aridity and warmth in southwestern North America. AGU press conference – San Francisco, CA.
2010 December. Stable isotopes in tree rings from Ethiopia suggest a changing moisture source during the summer rainy season. Monthly Climate Research Meeting – The Earth Research Institute (ERI) and Institute for Computational Earth System Science (ICESS) – UC Santa Barbara.

2010 November. Forest responses to increasing aridity and warmth in southwestern North America. Invited talk at the California Forest Pest Council Annual Meeting – Sacramento, CA.
2010 September. Diagnosing the causes of decadal-scale variability of precipitation in the Greater Horn of Africa. Monthly Climate Research Meeting – The Earth Research Institute (ERI) and Institute for Computational Earth System Science (ICESS) – UC Santa Barbara.
2010 August. Covariability among ocean temperatures, atmospheric circulation, and eastern African rainfall from March through September. Famine Early Warning System Network (FEWS NET) Meeting – Boulder, CO.
2010 August. Forest responses to increasing aridity and warmth in southwestern North America. Ecological Society of America (ESA) – Pittsburgh, PA.
2010 April. A westward extension of the warm pool intensifies the Walker circulation, drying eastern Africa. Famine Early Warning System Network (FEWS NET) Meeting – UC Santa Barbara, CA.
2009 June. Climatic controls on summertime fog and low stratus cloudiness along the US West Coast – Invited talk at Scripps Institute of Oceanography – La Jolla, CA.
2009 March. Climatic controls on summertime fog and low stratus cloudiness along the US West Coast – Pacific Climate Meeting (PACLIM) – Pacific Grove, CA.
2008 February. The influence of summertime fog and overcast clouds on the growth of a coastal Californian pine: a tree-ring study. Channel Islands Symposium – Oxnard, CA.
2007 December. Using tree-ring width data from 1,000 sites to predict how American forests will respond to climate change. American Geophysical Union Meeting – San Francisco, CA.
2007 October. Using tree-ring width data from 1000 sites to predict how American forests will respond to climate change. Biological Impacts of Climate Change in California (BICCCA) meeting – Stanford University, CA.

Poster Sessions

2016 December. Impact of anthropogenic climate change on wildfire across western US forests. American Geophysical Union Meeting – San Francisco, CA.
2014 December. Urbanization reduces fogginess in coastal Southern California. American Geophysical Union Meeting – San Francisco, CA.
2012 December. Temperature as a potent driver of regional forest drought stress and tree mortality. American Geophysical Union Meeting – San Francisco, CA.
2011 December. 1,100 years of past, present, and future forest response to drought in the North American Southwest. American Geophysical Union Meeting – San Francisco, CA.
2010 December. Diagnosing the causes of drought during the summer rainy season in the Greater Horn of Africa. American Geophysical Union Meeting – San Francisco, CA.
2009 December. Airflow toward Kenya during the long and short rainy seasons. American Geophysical Union Meeting – San Francisco, CA.
2008 December. Climatic controls on summertime fog and low stratus cloudiness along the US West Coast. American Geophysical Union Meeting – San Francisco, CA.
2006 March. Teasing foggy memories out of pines on the California Channel Islands using tree-ring and stable isotope approaches. Pacific Climate (PACLIM) meeting – Pacific Grove, CA.

2006 December. Teasing foggy memories out of pines on the California Channel Islands using tree-ring and stable isotope approaches. American Geophysical Union Meeting – San Francisco, CA.
2005 December. Fog and Vegetation on the California Channel Islands: A tree ring and satellite analysis. American Geophysical Union Meeting – San Francisco, CA.
2005 September. Fog and Vegetation on the California Channel Islands: A tree ring and satellite analysis. NASA Biodiversity and Ecological Forecasting team meeting – Washington, D.C.

Peer Reviewer

Journal reviews: 1 *Aerosol and Air Quality Research*; 2 *Agriculture and Forest Meteorology*; 3 *Atmospheric Chemistry and Physics*; 4 *Atmospheric Environment*; 5 *Biogeosciences*; 6 *Bulletin of the American Meteorological Society*; 7 *Climatic Change*; 8 *Climate Dynamics*; 9 *Columbia University Press*; 10 *Dendrochronologia*; 11 *Earth's Future*; 12 *Ecography*; 13 *Ecological Applications*; 14 *Ecology*; 15 *Ecology Letters*; 16 *Ecosystems*; 17 *Environmental Research Letters*; 18 *Geophysical Research Letters*; 19 *Global Change Biology*; 20 *Global Ecology and Biogeography*; 21 *Hydrological Processes*; 22 *International Journal of Climatology*; 23 *Journal of Applied Ecology*; 24 *Journal of Applied Meteorology and Climatology*; 25 *Journal of Biogeography*; 26 *Journal of Climate*; 27 *Journal of Forest Ecology and Management*; 28 *Journal of Geophysical Research – Atmospheres*; 29 *Journal of Geophysical Research – Biogeosciences*; 39 *Journal of Hydrology*; 31 *Journal of Hydrometeorology*; 32 *Journal of Selected Topics in Applied Earth Observations and Remote Sensing*; 33 *Journal of the Torrey Botanical Society*; 34 *Landscape Ecology*; 35 *Meteorological Applications*; 36 *Methods in Ecology and Evolution*; 37 *Nature*; 38 *Nature Climate Change*; 39 *Nature Communications*; 40 *Nature Ecology & Evolution*; 41 *Nature Geoscience*; 42 *New Phytologist*; 43 *npj Climate and Atmospheric Science*; 44 *Oecologia*; 45 *Plant, Cell & Environment*; 46 *Proceedings of the National Academy of Sciences USA*; 47 *Proceedings of the Royal Society B*; 48 *Quaternary Research*; 49 *Quaternary Science Advances*; 50 *Remote Sensing of Environment*; 51 *Science Advances*; 52 *Scientific Reports*; 53 *The Holocene*; 54 *Tree-Ring Research*; 55 *Water*

Grant Proposal reviews: LDEO Center for Climate & Life; LDEO Postdoctoral Fellowship; NSF Paleo Perspectives on Climate Change; USGS National Climate Change and Wildlife Science Center

Course Instructor

Fall 2021 UCLA; GEOG 191: Introduction to Climatology and Global Climate Change
Summer 2020 Columbia University; U6115: Climatology (part of the MPA program in Environmental Science and Policy, School of International and Public Affairs)
Summer 2019 Columbia University; U6115: Climatology
Summer 2018 Columbia University; U6115: Climatology
Summer 2017 Columbia University; U6115: Climatology
Summer 2016 Columbia University; U6115: Climatology
Summer 2007 UCSB; Geography 3B: Intro. to Physical Geography II: Land Surface Processes (co-taught with Ryan Perroy)

Teaching Assistantships

Spring 2008 UCSB; Geography 175: Environmental Data Analysis (Professor: Dar Roberts)
Winter 2008 UCSB; Geography 110: Introductory Meteorology (Professor: Joel Michaelsen)
Winter 2008 UCSB; Geography 3A: Intro. to Physical Geography (Professor: Tommy Dickey)

Fall 2007 UCSB; Environmental Studies 100: Environmental Ecology (Professor: Joshua Schimel)
Fall 2006 UCSB; Geography 3A: Intro. to Physical Geography (Professor: Christopher Still)
Fall 2004 UCSB; Geography 3A: Intro. to Physical Geography (Professor: Christopher Still)
Spring 2004 UCSB; Geography 134: Global Climate Change (Professor: Catherine Gautier)
Winter 2004 UCSB; Geography 3A: Intro. to Physical Geography (Professor: Christopher Still)
Fall 2003 UCSB; Geography 167: Biogeography (Professor: Christopher Still)

Supplemental Educational Activities as a Graduate Student

North American Dendroecological Fieldweek: June 2007. Completed a 1-week tree-ring field course in Smokey Mountains National Park, TN.
University of California, Santa Barbara – Geography Department: 2007. Worked to design a biogeography field methods course, funded by a UCSB course improvement grant.
University of California, Santa Barbara – Geography Department: 2005-2006. Assisted on a course improvement grant for Geography 167 (*Biogeography: The Study of Plant and Animal Distributions*, C. Still, instructor) to create a course workbook.
University of Arizona – Laboratory of Tree Ring Research: May 2005. Completed a 1-week Wood Anatomy course led by Dr. Fritz Schweingruber and Dr. Holger Gärtner.
University of Arizona – Laboratory of Tree Ring Research: May & June 2005. Completed a 2 week Dendroecology course led by Drs. Tom Swetnam and Don Falk.
University of Utah – Biology Department: June 2004. Completed a 2-week Stable Isotope Ecology course led by Dr. Jim Ehleringer and other leaders in the field.

Graduate students advised

Alexander Gottlieb (PhD, Dartmouth) 2021-present – External committee member
Zhaoxin Ban (PhD, UCLA) 2020-present – Committee member
Lu Su (PhD, ULCA) 2020-present – Committee member
Caroline Juang (PhD, Columbia) 2019-present – Committee chair
Krishna Rao (PhD, Stanford) 2019-present – External committee member
Daniel Kennedy (PhD, Columbia) 2018-2019 – Committee member
Arianna Varuolo-Clarke (PhD, Columbia) 2018-present – Committee co-chair
Daniel Bishop (PhD, Columbia) 2016-2021 – Committee chair
Colleen Baublitz (PhD, Columbia) 2016-present – Committee member
Xiaomeng Jin (PhD, Columbia) 2015-2020 – Committee member

Postdoctoral researchers mentored

Jatah Buch 2021-present – Co-mentor
Katherine (Kasey) Bolles 2018-present – Primary mentor
Winslow Hansen 2018-present – Primary mentor
Sha Zhou 2018-present – Co-mentor
Nathan Steiger 2016-present – Unofficial co-mentor
Justin Mankin 2016-2018 (now at Dartmouth College) – Unofficial co-mentor

Other synergistic activities

Conference organization

Co-organizer of the Conference on Fire Prediction Across Scales, a 3-day meeting of approximately 100 scientists, managers, and stake-holders interested in learning about

and improving fire modeling. Columbia University–New York, NY, October 23-25, 2017.

STEM outreach and diversity

March 2020. Guest on the Bill Nye *Science Rules* podcast. https://www.stitcher.com/podcast/stitcher/science-rules-with-bill-nye/e/68137498

January 2020. Video interview with 4th grade class in Brooklyn, NY about climate change, wildfires, and what they can do to help.

October 2019. Panelist in a discussion for the public at the Lamont-Doherty Open House, titled "Beyond Hot Headlines: New Frontiers in Effective Climate Communication"

January 2019. Workshop leader at the New York City Youth Climate Summit, put on by the NYC Department of Education "to empower 9th-12th grade students to learn about the issues related to climate change and collaborate on innovative cross-discipline solutions."

2018-2019. Mentor for a freshman at Nikola Tesla STEM High School in Redmond, WA. My role is to mentor this student's research project on wildfire prediction modeling for the 2019 Central Sound Regional Science and Engineering Fair.

November 2017. Participant in an NSF-funded 3-day GeoDES workshop at UCAR (Boulder, CO) to enhance social justice and diversity in the geosciences.

February 2017. Video lesson on tree rings and climate for Lindsey Middle School in Long Beach, California.

November 2015. Demonstration on tree rings and climate for high-school students from Harlem, NY through Columbia University's Double Discovery Center, which aims to increase high-school graduation and college education among first-generation college-bound youth from low performing schools in northern Manhattan.

Interaction with practitioners

Invited 45-minute talk at the annual meeting on Seasonal to Sub-Seasonal Precipitation Forecasting, held by the Western States Water Council and the California Department of Water Resources. San Diego, CA. May 2019.

Invited public lecture for the Climate Change Education Seminar Series, hosted by the New Mexico State University. Las Cruces, NM. April 2019.

Invited participant at the National Academies of Sciences Sackler Forum on Climate Change and Ecosystems, held in at the NAS Headquarters in Washington D.C. November 2018.

Contributing Author of California's Fourth Climate Change Assessment, Statewide Summary Report, published August 27, 2018: http://climateassessment.ca.gov/

Invited participant at a workshop at the University of Idaho titled "Towards a National Fire Science and Technology Center: Goals for Collaboration." The ultimate objective is to develop a proposal that aims to improved integration of wildfire research/modeling with management. June 2017.

Three-day visit to Santiago and Valparaiso, Chile to present to universities and meet with government officials to discussion the recent devastating Chilean wildfires that occurred in southern hemisphere summer 2016/17. May 2017.

Meetings with officials in the California Department of Water Resources (DWR), including Jeanine Jones who oversees DWR-sponsored research. The purpose of the meetings was to discuss research ideas and how I can enhance the usefulness of my research. April 2017–present.

Invited participation in a small workshop (~30 participants) in San Francisco, CA on Droughts of the Future organized by the Public Institute of California Center for Water Policy. April 2017.

Invited participant at the National Academies of Sciences Workshop on Wildland Fire, held in at the NAS Headquarters in Washington D.C. The theme of the workshop is "A Century of Wildland Fire: Contributions to Long-Term Approaches for Wildland Fire Management." March 2017.

Keynote talk and participation at NIDIS workshop for wildfire managers in Boise, Idaho. October 2015.

University committee service

2020: Lamont-Doherty Earth Observatory Vision Committee
2019: Search committee member – Columbia University Climate & Life Fellowship
2018: Search committee member – Columbia University Climate & Life Fellowship
2017: Search committee member – Columbia University Climate & Life Fellowship
2016/17: Search committee member – Lamont Research Professor for the Oceanography and Climate Physics Division
2016: Search committee member – Columbia University Climate & Life Fellowship
2015/16: Search committee Chair – Lamont Postdoc Fellowship
2014/15: Search committee member – Lamont Postdoc Fellowship

Select recent media coverage

https://www.nytimes.com/2020/04/24/nyregion/lamont-doherty-earth-observatory-global-warming.html
https://www.economist.com/science-and-technology/2020/04/18/the-american-wests-drought-is-its-second-worst-for-12-centuries
https://www.nytimes.com/2020/04/16/climate/drought-southwest-climate-change.html
https://www.teenvogue.com/story/california-wildfires-why-happening
https://www.nytimes.com/2019/10/25/climate/california-fires-climate-change.html
https://www.pbs.org/newshour/show/climate-change-is-part-of-californias-perfect-recipe-for-intense-wildfire
https://www.nytimes.com/2017/12/07/climate/california-fires-warming.html
https://www.democracynow.org/2017/10/11/as_deadly_wildfires_rage_in_california
http://www.climatecentral.org/news/climate-change-behind-surge-western-wildfires-20775
https://www.nytimes.com/2016/10/11/science/climate-change-forest-fires.html
http://www.mercurynews.com/2016/10/10/new-study-forest-fires-have-doubled-in-west-due-to-climate-change/
https://www.nytimes.com/2015/08/21/science/climate-change-intensifies-california-drought-scientists-say.html
http://www.latimes.com/science/la-sci-climate-change-drought-20150820-story.html
https://www.democracynow.org/2015/8/21/global_warming_worsens_california_drought_as
http://www.latimes.com/science/sciencenow/la-sci-sn-summer-fog-urban-sprawl-20150306-story.html