SARAH B. KAPNICK

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Citizenship Status: U.S. Citizen

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EDUCATION

University of California, Los Angeles (UCLA)	Los Angeles, CA
Ph.D. in Atmospheric and Oceanic Sciences, Advisor: Alex D. Hall	2011
Leaders in Sustainability Certificate, Institute of Environment and Sustainability	2011
M.S. in Atmospheric Sciences	2007
Princeton University	Princeton, NJ
A.B., Mathematics, Senior Thesis Advisor: S. George Philander	2004
Certificate in Finance, Bendheim Center for Finance	2004

AWARDS AND FELLOWSHIPS

- Daniel L. Albritton Outstanding Communicator Award, Oceanic and Atmospheric Research, NOAA, 2017
- AGU Cryosphere Section Early Career Award, American Geophysical Union (AGU), 2015
- Visiting Scientist Award, Integrated Climate System Analysis and Prediction (CliSAP), University of Hamburg, 2014
- NSF Atmospheric and Geospace Sciences Postdoctoral Research Fellowship, National Science Foundation, 2013-2015
- ThinkSwiss Travel Grant Award, ThinkSwiss.org, Switzerland, 2012
- Bjerknes Award for academic excellence, Department of Atmospheric and Oceanic Sciences, UCLA, 2011
- Mautner Graduate Student Award for demonstrating the highest academic achievement, excellence in research
 and teaching, dedicated community and university involvement, and scientific communication skills, Physical
 and Life Sciences Division, UCLA, 2011
- Brian Lance Bosart Memorial Award for unselfish service to fellow students and positive contributions to department life, Department of Atmospheric and Oceanic Sciences, UCLA, 2010
- UCLA Dissertation Fellowship, UCLA, 2010-2011
- Switzer Environmental Fellowship Award, Robert & Patricia Switzer Foundation, 2010
- UCLA Charles E. and Sue K. Young Graduate Student Award for outstanding graduate students for exemplary academic achievement, research, and university citizenship, College of Letters and Sciences, UCLA, 2010
- NASA Earth and Space Science Fellowship, National Aeronautics and Space Administration (NASA), 2007-2010

WORK EXPERIENCE

- Deputy Division Leader and Research Physical Scientist (ZP-4), 2018 Present, Seasonal to Decadal Predictability and Variability Division, Geophysical Fluid Dynamics Laboratory (GFDL), National Oceanic and Atmospheric Administration (NOAA).
- Research Physical Scientist (ZP-4), 2015 2017, Climate Variations and Predictability Group, Geophysical Fluid Dynamics Laboratory (GFDL), National Oceanic and Atmospheric Administration (NOAA).
- NSF Postdoctoral Research Fellow, 2013 2015, Atmospheric and Oceanic Sciences Program, Princeton University. Faculty host: Thomas L. Delworth.

- Postdoctoral Research Associate and Visiting Scientist, 2011 2013, Atmospheric and Oceanic Sciences Program, Princeton University and GFDL, NOAA. Faculty advisor: Thomas L. Delworth.
- Investment Banking Analyst, 2004 2006, Financial Institutions Group, Investment Banking Division, Goldman Sachs, New York. Mainly advised reinsurance and exchange industries on securities and risk management.

PUBLICATIONS

underlined names indicates student, postdoc, or research associate advised

SUBMITTED / IN REVISION

- 1. Catalano AJ, Broccoli AJ, **Kapnick SB**, Janoski TP, 2018: High-impact extratropical cyclones in a long coupled climate model simulation. *Submitted*.
- 2. <u>van der Wiel K</u>, **Kapnick SB**, Vecchi GA, Smith J, Milly PCD, Jia L, 2018: Characteristics and future changes of 100-year Mississippi floods in a global climate model. *In revision*.
- 3. <u>Pascale S</u>, **Kapnick SB**, Bordoni S, Delworth T, 2018: The influence of CO2 forcing on North American monsoon moisture surges and precipitation intensity in the southwestern United States. *In revision*.
- 4. Sergienko O, Shah K, Kapnick SB, Harrison M, Brun F, 2018: Projected shift in sources and timing of freshwater supply in High-Mountain Asia under warming climate conditions. *In revision*.
- 5. <u>Janoski TP</u>, Broccoli AJ, **Kapnick SB**, Johnson NC, 2018: Effects of Climate Change on Wind-Driven Heavy Snowfall Events over Eastern North America. *In revision*.

PEER-REVIEWED JOURNAL ARTICLES

- Yang X, Jia L, Kapnick SB, Delworth T, Vecchi GA, Gudgel R, Underwood S, Zeng F, 2018: On the seasonal prediction of the western United States El Niño precipitation pattern during the 2015/16 winter. In Press at Climate Dynamics. doi:10.1007/s00382-018-4109-3.
- 7. <u>Barcikowska M</u>, **Kapnick SB**, Feser F, 2018: Impact of large-scale circulation changes in the North Atlantic sector on the current and future Mediterranean winter hydroclimate. *Climate Dynamics*, **50**, 2039–2059.
- 8. Krishnamurthy L, Vecchi GA, Yang X, <u>van der Wiel K</u>, Balaji V, **Kapnick SB**, Jia L, Zeng F, Paffendorf K, Underwood S, 2018: Causes and probability of occurrence of extreme precipitation events like Chennai 2015. *Journal of Climate*, **31**, 3831–3848.
- Wrzesien M, Durand M, Pavelsky T, Kapnick SB, Zhang Y, Guo J, Shum CK, 2018: A new estimate of North American mountain snow accumulation from regional climate model simulations. *Geophysical Research Letters*, 45, 1423-1432, doi:10.1002/2017GL076664.
- Kapnick SB, Yang X, Vecchi GA, Delworth T, Gudgel R, Malyshev S, Milly PCD, Shevliakova E, Underwood S, Margulis S, 2018: Potential for Western United States Seasonal Snowpack Prediction. Proceedings of the National Academy of Sciences, 115(6), 1180–1185. doi:10.1073/pnas.1716760115.
- 11. <u>Pascale S</u>, Boos W, Bordoni S, Delworth T, **Kapnick SB**, Murakami H, Vecchi GA, Zhang W, 2017: Weakening of the North American monsoon with global warming. *Nature Climate Change*, **7**, 806–812. doi:10.1038/nclimate3412.
- 12. Tommasi D, Stock C, Hobday A, Methot R, Kaplan I, Eveson J, Holsman K, Miller T, Gaichas S, Gehlen M, Pershing A, Vecchi GA, Msadek R, Delworth T, Eakin M, Sefarian R, Spillman C, Hartog J, Siedlecki S, Samhouri J, Muhling B, Asch R, Pinsky M, Saba V, Kapnick SB, Gaitan C, Rykaczewski R, Alexander M, Xue Y, Pegion K, Lynch P, Payne M, Kristiansen T, Lehodey P, Werner C, 2017: Managing living marine resources in a dynamic environment: the role of seasonal to decadal climate forecasts. Progress in Oceanography, 152, 15-49.
- 13. war der Wiel K, Kapnick SB, van Oldenborgh GJ, Whan K, Philip S, Vecchi GA, Singh RK, Arrighi J, Cullen H, 2017: Rapid attribution of the August 2016 flood-inducing extreme precipitation in south Louisiana to climate change, *Hydrol. Earth Syst. Sci.*, 21, 897-921, doi:10.5194/hess-2016-448.
- 14. <u>van der Wiel K</u>, **Kapnick SB**, Vecchi GA, 2017: Shifting patterns of mild weather in response to climate change forcing. *Climatic Change*, **140**, 649-658.
- 15. Lemoine D and **Kapnick SB**, 2016: A Top-Down Approach to Projecting Market Impacts of Climate Change, Nature Climate Change, 6, 51-55, doi:10.1038/nclimate2759.

- Pascale S, Bordoni S, Kapnick SB, Vecchi GA, Jia L, Delworth T, Underwood S, Anderson W, 2016: The impact of horizontal resolution on North American monsoon Gulf of California moisture surges in a suite of coupled global climate models. *Journal of Climate*, 29 (21), 7911-7936.
- van der Wiel K, Kapnick SB, Vecchi GA, Cooke W, Delworth T, Jia L, Murakami H, Underwood S, Zeng F, 2016: The resolution dependence of US precipitation extremes in response to CO2 forcing. *Journal of Climate*, 29 (22), 7991-8012.
- 18. Jia L, Yang Z, Vecchi GA, Gudgel R, Delworth T, Rosati A, Stern B, Wittenberg AT, Krishnamurthy L, Zhang S, Msadek R, Kapnick SB, Underwood S, Zeng F, Anderson W, Balaji V, Dixon K, 2015: Improved Seasonal Prediction of Temperature and Precipitation over Land in a High-Resolution GFDL Climate Model. Journal of Climate, 28 (5), 2044-2062.
- Wrzesien M, Pavelsky T, Kapnick SB, Durand M, Painter T, 2015: Validation of Snow Cover Fraction for Regional Climate Simulations in the Sierra Nevada. *International Journal of Climatology*, 35, 2472-2484.
- 20. Yang X, Vecchi GA, Gudgel R, Delworth T, Zhang S, Rosati A, Jia L, Stern W, Wittenberg AT, Kapnick SB, Msadek R, Underwood S, Zeng F, Anderson W, Balaji V, 2015: Seasonal predictability of extratropical storm tracks in a high-resolution GFDL climate prediction model. *Journal of Climate*, 28 (9), 3592-3611.
- Kapnick SB, Delworth T, Ashfaq M, Malyshev S, Milly PCD, 2014: Snowfall less sensitive to warming in Karakoram than in Himalayas due to a unique seasonal cycle. Nature Geoscience, 7, 834-840, doi:10.1038/ngeo2269.
- 22. Vecchi GA, Delworth T, Gudgel R, Kapnick SB, Rosati A, Zeng F, Anderson W, Balaji V, Jia L, Kim H-S, Krishnamurthy L, Msadek R, Stern WF, Underwood S, Villarini G, Wittenberg AT, Yang X, Zhang S, 2014: On the Seasonal Forecasting of Regional Tropical Cyclone Activity. *Journal of Climate*, 27 (21), 7994-8016.
- Kapnick SB and Delworth T, 2013: Controls of Global Snow Under a Changed Climate. Journal of Climate, 26 (15), 5537-5562.
- 24. Pavelsky T, Sobolowski S, **Kapnick SB**, Barnes J, 2012: Changes in orographic precipitation patterns caused by a shift from snow to rain. *Geophysical Research Letters*, **39**, L18706, doi:10.1029/2012GL052741.
- Kapnick SB and Hall A, 2012: Causes of recent changes in western North American snowpack. Climate Dynamics, 38 (9), 1885-1899, doi:10.1007/s00382-011-1089-y.
- 26. Waliser D, Kim J, Xue Y, Chao Y, Eldering A, Fovell R, Hall A, Li Q, Liou K-N, McWilliams J, **Kapnick SB**, Vasic R, De Sale R, Yu Y, 2012: Simulating the Sierra Nevada snowpack: The impact of snow albedo and multi-layer snow physics. *Climatic Change*, **109** (S1), 95-117.
- 27. Boé J, Hall A, Colas F, McWilliams J, Qu X, Kurian J, **Kapnick SB**, 2011: What shapes mesoscale wind anomalies in coastal upwelling zones? *Climate Dynamics*, **36** (11), 2037-2049, doi:10.1007/s00382-011-1058-5.
- 28. Pavelsky T, **Kapnick SB**, Hall A, 2011: Accumulation and melt dynamics of snowpack from a multi-resolution regional climate model in the central Sierra Nevada, California. *JGR-Atmospheres*, **116**, doi:10.1029/2010JD015479.
- 29. **Kapnick SB** and Hall A, 2010: Observed climate-snowpack relationships in California and their implications for the future. *Journal of Climate*, **23** (13), 3446-3456.

PEER-REVIEWED GOVERNMENT DOCUMENTS

- 30. **Kapnick S** and Hall A, 2009: Observed changes in the Sierra Nevada snowpack: potential causes and concerns. California Environmental Protection Agency and California Energy Commission Report CEC-500-2009-016-F.
- 31. Kim J, Fovell R, Hall A, Li Q, Liou K-N, McWilliams J, Xue Y, Qu X, **Kapnick S**, Waliser D, Eldering A, Chao Y, Friedl R, 2009: A projection of the cold season hydroclimate in California in mid-21st century under the SRES-A1B emission scenario. California Environmental Protection Agency and California Energy Commission Report CEC-500-2009-029-F.
- 32. Waliser D, Kim J, Xue Y, Chao Y, Eldering A, Fovell R, Hall A, Li Q, Liou K-N, McWilliams J, **Kapnick S**, Vasic R, De Sale R, Yu Y, 2009: Simulating the Sierra Nevada snowpack: The impact of snow albedo and multi-layer snow physics. California Environmental Protection Agency and California Energy Commission Report CEC-500-2009-030-F.

TALKS

ACADEMIC

† indicates invited

2018

- † NOAA Fisheries Pacific Northwest, Webinar
- † Western States Water Council, San Diego, CA
- † Pacific Northwest Drought and Climate Outlook, National Integrated Drought Information System Program (NIDIS), Webinar
- † American Meteorological Society (AMS) Workshop on Water Management Forecasting, Washington, D.C.
- † NASA High Mountain Asia Team (HiMAT) Team Meeting, Seattle, WA
- † NOAA National Integrated Drought Information System Program (NIDIS), Webinar
- † UCLA, Department of Atmospheric and Oceanic Sciences, Los Angeles, CA

2017

- † Rutgers University, Department of Environmental Sciences, New Brunswick, NJ
- † Princeton University, Department of Geosciences, Princeton, NJ
- † California Institute of Technology, Department of Environmental Science and Engineering, Pasadena, CA
- † NASA High Mountain Asia Team (HiMAT) Team Meeting with Chinese Academy of Sciences, Juneau, AK AMS 30th Conference on Climate Variability and Change, Baltimore, MD
- † NOAA Modeling, Analysis, Predictions and Projections (MAPP) Webinar
- † NASA High Mountain Asia Team (HiMAT) Team Meeting on Precipitation, NASA Goddard Space Flight Center, Greenbelt, MD
- AGU Annual Meeting, New Orleans, LA

2016

- † iSWGR NASA Snow Meeting, University of Washington, Seattle, WA
- † Western States Water Council / NOAA Meeting on Seasonal to Subseasonal Prediction, San Diego, CA WCRP Workshop on Model Hierarchies, Princeton University, Princeton, NJ
- † NASA High Mountain Asia Team (HiMAT) Team Meeting, NASA Goddard Space Flight Center, Greenbelt, MD

2015

- † AGU Annual Meeting, San Francisco, CA
- † SUNY-Stony Brook, School of Marine and Atmospheric Sciences, Stony Brook, NY
- † Western States Water Council / NOAA Meeting on Seasonal to Subseasonal Prediction, Salt Lake City, UT

2014

- † Max-Planck-Institute for Meteorology and University of Hamburg Institute of Oceanography Joint Seminar, Hamburg, Germany
- GEWEX Conference on Global Water and Energy Cycle, The Hague, Netherlands
- † SUNY-Albany, Department of Atmospheric and Environmental Sciences, Albany, NY

• 2013

AGU Annual Meeting

- † Rutgers University, Department of Environmental Sciences, New Brunswick, NJ
- † NOAA Modeling, Analysis, Predictions and Projections (MAPP) Webinar
- † UNC-Chapel Hill, Department of Geological Sciences, Chapel Hill, NC
- † NOAA Headquarters, NOAA Library, Silver Spring, MD
- † Columbia University Lamont-Doherty Earth Observatory, Palisades, NY
- † Yale University, Department of Geology and Geophysics, New Haven, CT

• 2012

AGU Annual Meeting

 \dagger Dissertation Initiative for the advancement of Climate Change ReSearch (DISCCRS) VII, Colorado Springs, CO

National Centres of Competence in Research (NCCR) Climate Summer School, Ticino, Switzerland † Princeton University, Princeton Institute for International and Regional Studies, Princeton, NJ

2011

- † NOAA GFDL, Princeton, NJ
- † UCLA, Department of Atmospheric and Oceanic Sciences, Los Angeles, CA

AMS Annual Meeting, Seattle, WA

• 2010

† Stevens Institute of Technology, Department of Civil, Environmental, Ocean Engineering, Hoboken, NJ † NASA Goddard Institute for Space Studies, New York, NY

2009

† Department of Energy Pacific Northwest National Laboratory, Richland, WA

• 2008

† Climate, Ecosystems, and Resources in Eastern California Conference, Bishop, CA California Climate Change Research Conference, Sacramento, CA

SELECTED OUTREACH (SINCE 2014)

- 2018 Climate Change: How We Know, Taste of Science Festival, New York, NY
- 2018 Seasonal Water Resource Prediction, Congressional AMS Hill Briefing, Washington, D.C.
- 2018 Using Climate Science to Understand Water, Extreme Weather, and Economic Growth, Princeton Energy & Climate Scholars Round Table, Princeton Environmental Institute, Princeton University, Princeton, NJ.
- 2017 The Climate Influence on Financial Markets and Decision Making, Energy Round Table Dinner, Princeton Environmental Institute, Princeton University, Princeton, NJ.
- 2017 Middle School STEM Ambassador of Climatology: What it's like to work as a climate scientist at NOAA, Video segment for Pearson, www.pearson.com
- 2016 Mountain Climate: Variability, Predictability, and Water Supply, NOAA Science Days on Water, Silver Spring, MD and Washington, D.C.
- 2015 Ice, Glaciers, and Snow: How a Scientist Views Glacier Photographs, Princeton Day School, Princeton, NJ.
- 2014 Superstorm Sandy and NYC, NOAA Science on a Sphere, World Science Festival, New York, NY.
- 2014 Climate, Finance, and Renewables: What You Should Know, Energy Round Table Dinner, Princeton Environmental Institute, Princeton University, Princeton, NJ.

PROPOSALS

Quantifying the Role of Dust on Precipitation, Snow, and Runoff in High Mountain Asia. Space and Earth Sciences Division, National Aeronautics and Space Administration (NASA), #15-HMA15-0016, 2017-2019. Principal Investigator, \$518,447.

ACADEMIC COMMITTEES & ADVISING

POSTDOCTORAL RESEARCHERS & RESEARCH ASSOCIATES ADVISED

- Hoi Ga Veronica Chan
- Salvatore Pascale
- Karin van der Wiel (now at Koninklijk Nederlands Meteorologisch Instituut, KNMI)
- Monika Barcikowska (now at Environmental Defense Fund)

GRADUATE STUDENT COMMITTEE MEMBER

- Justin Ng (Princeton University)
- Arielle Catalano (Rutgers University)

GRADUATE STUDENT SUMMER INTERNS

• Robin Sehler, Geosciences and Environment, California State Los Angeles (Princeton University Cooperative Institute for Climate Science Summer Internship)

UNDERGRADUATE STUDENTS ADVISED

† Subsequently pursued a STEM graduate program

- Laura Queen, Physics, University of Oregon (NOAA Hollings Scholar)
- † Haylie Mikulak, Meteorology, University of Nebraska-Lincoln (Princeton University Cooperative Institute for Climate Science Summer Internship)
- † Tyler Janoski, School of Environmental and Biological Sciences, Marine Science and Meteorology, Rutgers University (NOAA Hollings Scholar Advisor and Senior Thesis Co-Advisor)
- † Kasturi Shah, Physics, Princeton University (Collaborator on Senior Thesis)
- † Melissa Wrzesien, Geological Sciences, University of North Carolina Chapel Hill (Collaborator on Senior Thesis)

TEACHING EXPERIENCE

- Guest Lecture, Fall 2015: GLOB1-GC1030, International Political Economy, New York University
- Guest Lecture, Summer 2014: GLOB1-CE9905, Carbon-Constrained Economies, New York University
- Guest Lecturer (2), Spring 2012: GEO 202, Ocean, Atmosphere, and Climate, Princeton University
- Guest Lecturer (2), Spring 2009 and 2008: AOS 201B, Geophysical Fluid Dynamics II, UCLA
- Guest Lecturer (2), Winter 2009: AOS 201A, Geophysical Fluid Dynamics I, UCLA
- Teaching Assistant, Spring 2008: AOS 1, Climate Change: Puzzles and Policies, UCLA

SERVICE

BROAD COMMUNITY

- Associate Editor, Water Resources Research, 2017-Present
- Honors Committee Member for the Cryosphere Section of the American Geophysical Union, 2016, 2017
- $\bullet\,$ Judge for Princeton Women in Geosciences Elevator Pitch Practice, 2016
- Meeting Design Team for High Mountain Asia Team (HiMAT) Meeting, NASA Goddard Space Flight Center, Greenbelt, MD, 2016
- Panelist Judge for American Geophysical Union Thriving Earth Exchange, 2015
- Co-founder and co-organizer of Princeton Women in Geosciences, a program to create and implement a
 mentoring and career development program for early career scientists working in the Geosciences at Princeton
 University (in the Geosciences Department and Atmospheric and Oceanic Sciences Program). This program
 has been replicated at other institutions and in other departments at Princeton University. Successfully
 funded by a proposal written for the Princeton University Dean of Graduate Studies and both member
 departments, 2012-2015
- Co-convener of session: "Cold season precipitation: projected changes in snow from observations, models and reanalyses", GEWEX Conference on Global Water and Energy Cycle, 2014
- Science Expert Panelist to the U.S. Fish and Wildlife Service to review the science associated with a proposal to list the wolverine as Threatened under the Endangered Species Act, 2014
- Applicant reviewer for Dissertation Initiative for the advancement of Climate Change ReSearch (DISCCRS)
 VIII Symposium, 2013
- General education engagement: career day speaker and responsive to students inquiries on science and scientific careers. Engaged with various schools and students nationally and internationally through giving classroom visits, answering questions via email, and Skype. 2010-Present
- Science Expert to the Chicago Symphony Orchestra for the Beyond the Score program for Debussy's La Mer performance. The program was first performed in Chicago in May 2010 and has since traveled to other cities, 2010
- Member of: American Geophysical Union, American Meteorological Society, and American Association for the Advancement of Science

GFDL & NOAA

- Research Council Member, GFDL, 2017-Present
- Science Panel Member, Climate.gov, 2016-Present
- Steering Committee Member for NOAA Forums (workshops for developing research priorities and best practices), Oceanic and Atmospheric Research Division, NOAA, 2016-Present
- Speaker on the subject of western U.S. snowpack, NOAA Science Days, March 2016
- Early Career Scientist Committee Member, GFDL, 2015-2016
- Co-organizer of Climate Variations and Predictability Group Career Development Discussion Program, 2014-2016

REFEREE

- Manuscripts: Bulletin of the American Meteorological Society, Climatic Change, Climatic Change Letters, Climate Dynamics, Environmental Health Perspectives, Environmental Research Letters, Geophysical Research Letters, Hydrology and Earth System Sciences Discussions, Journal of Climate, Journal of Geophysical Research, Journal of Hydrometeorology, Nature, Nature Climate Change, Proceedings of the National Academy of Sciences, Science, Science Advances, The Cryosphere, Water Resources Research
- Proposal Panelist for:
 - National Science Foundation
 - NASA
- Proposal Reviewer for:
 - NOAA Climate Observations and Monitoring Program
 - NOAA Sea Grant
 - Swiss National Science Foundation
- Assessments / Reports:
 - -2018 Special Report on the Ocean and Cryosphere in a Changing Climate, Intergovernmental Panel on Climate Change
 - -2018 California's Fourth Climate Change Assessment
 - -2017 Hindu Kush Himalayan Monitoring and Assessment Programme (HiMAP), Chapter 7

Published Media Interviews

Print / Online

Arizona Daily Star • Arizona Daily Sun • Associate Press • Bloomberg News • CBS Local • Chicago Tribune • Clean Technica • Climate Central • ClimateNexus • Climatewire • CNN • Daily Mail • The Desert Sun • Digital Journal • Discovery.com • Environmental Health Perspectives • Grist • High Country News • Huffington Post • Independent • International Business Times • KQED • KUOW • Las Vegas Sun • LiveScience • McClatchyDC • Miami Herald • Mother Jones • News Deeply • Newsweek • NOLA.com • Notizie Scientifiche • Phys.org • Popular Science • Refinery29 • San Diego Union-Tribune • Science & Vie • Scientific American • Science Daily • Time • USA Today • U.S. News & World Report • Vox.com • Washington Post • WeatherNationtv.com • World is One News • ZME Science

Radio / Video

Associate Press • KPCC (Southern California) • KUOW (Seattle) • Michigan Radio • Oregon Public Broadcasting • WMNF (Florida)