

# SARAH B. KAPNICK

201 Forrestal Road  
Princeton, NJ, 08540  
<https://www.gfdl.noaa.gov/sarah-kapnicks-homepage/>

Office Phone: (609) 452-6548  
Email: [sarah.kapnick@noaa.gov](mailto:sarah.kapnick@noaa.gov)  
Citizenship Status: U.S. Citizen

## EDUCATION

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<b>University of California, Los Angeles (UCLA)</b>	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
<b>Princeton University</b>	Princeton, NJ
A.B., Mathematics, Senior Thesis Advisor: S. George Philander	2004
Certificate in Finance, Bendheim Center for Finance	2004

## AWARDS AND FELLOWSHIPS

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- *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

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- **Research Physical Scientist (ZP-4), 2015 - Present**, 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

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underlined names indicates student, postdoc, or research associate advised

### SUBMITTED

1. Janoski TP, Broccoli AJ, **Kapnick SB**, Johnson NC, 2017: Effects of Climate Change on Wind-Driven Heavy Snowfall Events over Eastern North America. *Submitted*.
2. Yang X, Jia L, **Kapnick S**, Delworth T, Vecchi GA, Gudgel R, Underwood S, Zeng F, 2017: On the seasonal prediction of the western United States El Niño precipitation pattern during the 2015/16 winter. *In revision*.
3. **Kapnick S**, Yang X, Vecchi GA, Delworth T, Gudgel R, Malyshev S, Milly PCD, Shevliakova E, Underwood S, Margulis S, 2017: Potential for Western United States Seasonal Snowpack Prediction. *In revision*.
4. Krishnamurthy L, Vecchi GA, Yang X, van der Wiel K, Balaji V, **Kapnick S**, Jia L, Zeng F, Paffendorf K, Underwood S, 2017: Precipitation-induced Extreme Chennai Flood Event of 2015. *In revision*.
5. Wrzesien M, Durand M, Pavelsky T, **Kapnick S**, 2017: A new estimate of North American mountain snow accumulation from regional climate model simulations. *In revision*.

### PEER-REVIEWED JOURNAL ARTICLES

6. Pascale S, Boos W, Bordoni S, Delworth T, **Kapnick S**, Murakami H, Vecchi GA, Zhang W, 2017: Weakening of the North American monsoon with global warming. *Nature Climate Change*, doi:10.1038/nclimate3412.
7. Barcikowska M, **Kapnick S**, Feser F, 2017: Impact of large-scale circulation changes in the North Atlantic sector on the current and future Mediterranean winter hydroclimate. *Climate Dynamics*, doi:doi.org/10.1007/s00382-017-3735-5.
8. 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 S**, 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.
9. van der Wiel K, **Kapnick S**, 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.
10. van der Wiel K, **Kapnick S**, Vecchi GA, 2017: Shifting patterns of mild weather in response to climate change forcing. *Climatic Change*, **140**, 649-658.
11. Lemoine D and **Kapnick S**, 2016: A Top-Down Approach to Projecting Market Impacts of Climate Change, *Nature Climate Change*, **6**, 51-55, doi:10.1038/nclimate2759.
12. Pascale S, Bordoni S, **Kapnick S**, 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.
13. van der Wiel K, **Kapnick S**, 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.
14. Jia L, Yang Z, Vecchi GA, Gudgel R, Delworth T, Rosati A, Stern B, Wittenberg AT, Krishnamurthy L, Zhang S, Msadek R, **Kapnick S**, 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.
15. Wrzesien M, Pavelsky T, **Kapnick S**, 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.
16. Yang X, Vecchi GA, Gudgel R, Delworth T, Zhang S, Rosati A, Jia L, Stern W, Wittenberg AT, **Kapnick S**, 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.
17. **Kapnick S**, 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.

18. Vecchi GA, Delworth T, Gudgel R, **Kapnick S**, 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.
19. **Kapnick S** and Delworth T, 2013: Controls of Global Snow Under a Changed Climate. *Journal of Climate*, **26** (15), 5537-5562.
20. Pavelsky T, Sobolowski S, **Kapnick S**, 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.
21. **Kapnick S** 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.
22. 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, 2012: Simulating the Sierra Nevada snowpack: The impact of snow albedo and multi-layer snow physics. *Climatic Change*, **109** (S1), 95-117.
23. Boé J, Hall A, Colas F, McWilliams J, Qu X, Kurian J, **Kapnick S**, 2011: What shapes mesoscale wind anomalies in coastal upwelling zones? *Climate Dynamics*, **36** (11), 2037-2049, doi:10.1007/s00382-011-1058-5.
24. Pavelsky T, **Kapnick S**, 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.
25. **Kapnick S** 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

26. **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.
27. 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.
28. 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

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### ACADEMIC

† indicates invited

- **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 (Scheduled)

- **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
  - † 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
  - 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)

- **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](http://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

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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

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### POSTDOCTORAL RESEARCHERS & RESEARCH ASSOCIATES ADVISED

- 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)

### UNDERGRADUATE STUDENTS ADVISED

- Haylie Mikulak, Meteorology, University of Nebraska-Lincoln, Advisor for Summer Internship through Co-operative Institute for Climate Science (present graduate student at University of Georgia)
- Tyler Janoski, School of Environmental and Biological Sciences, Marine Science and Meteorology, Rutgers University, NOAA Hollings Scholar Advisor and Senior Thesis Co-Advisor (present graduate student at Columbia University)
- Kasturi Shah, Physics, Princeton University, Collaborator on Senior Thesis (present graduate student at Massachusetts Institute of Technology)
- Melissa Wrzesien, Geological Sciences, University of North Carolina Chapel Hill, Collaborator on Senior Thesis (Ph.D. candidate at Ohio State)

## TEACHING EXPERIENCE

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- **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

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### BROAD COMMUNITY

- Associate Editor, *Water Resources Research*, 2017-Present
- Honors Committee Member for the Cryosphere Section of the American Geophysical Union, 2016, 2017
- 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-convenor 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
- 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 Geophysics 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*
- Assessments: 2017 Hindu Kush Himalayan Monitoring and Assessment Programme (HiMAP), Chapter 7
- Proposal Panelist for:
  - National Science Foundation
  - NASA
- Proposal Reviewer for:
  - NOAA Climate Observations and Monitoring Program
  - NOAA Sea Grant
  - Swiss National Science Foundation

## **Published Media Interviews**

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### **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 • Huffington Post • Independent • International Business Times • KQED • LiveScience • McClatchyDC • Miami Herald • Mother Jones • NOLA.com • Notizie Scientifiche • Phys.org • Popular Science • Refinery29 • Science & Vie • Scientific American • Science Daily • Time • USA Today • U.S. News & World Report • Vox.com • Washington Post • World is One News • ZME Science

### **Radio / Video**

Associate Press • Michigan Radio • Oregon Public Broadcasting • WMNF (Florida)