SARAH B. KAPNICK

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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*

ACADEMIC AWARDS AND FELLOWSHIPS

- *AGU Cryosphere Section Early Career Award*, American Geophysical Union 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*, ThinkSwiss.org, Switzerland, 2012
- *Bjerknes Award*, Department of Atmospheric and Oceanic Sciences, UCLA, 2011
- *Mautner Graduate Student Award*, Physical and Life Sciences Division, UCLA, 2011
- *Brian Lance Bosart Memorial Award*, 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*, College of Letters and Sciences, UCLA, 2010
- *NASA Earth and Space Science Fellowship*, National Aeronautics and Space Administration (NASA), 2007-2010
- *Edwin W. Pauley Fellowship*, UCLA, 2006-2007
- *Roy and Dorothy John Fellowship*, UCLA, 2006-2007

WORK EXPERIENCE

- **January 2015 - Present: Research Physical Scientist**, Climate Variations and Predictability Group, Geophysical Fluid Dynamics Laboratory (GFDL), National Oceanic and Atmospheric Administration (NOAA).
- **November 2013 - January 2015: NSF Postdoctoral Research Fellow**, Atmospheric and Oceanic Sciences Program, Princeton University. Faculty host: Thomas L. Delworth.
- **October 2011-October 2013: Postdoctoral Research Associate and Visiting Scientist**, Atmospheric and Oceanic Sciences Program, Princeton University and GFDL, NOAA. Faculty advisor: Thomas L. Delworth.
- **June 2011-September 2011: Research Assistant**, Atmospheric and Oceanic Sciences, UCLA. Faculty advisor: Alex D. Hall.
- **July 2004-June 2006: Analyst**, Financial Institutions Group, Investment Banking Division, Goldman Sachs. Mainly advised reinsurance and exchange industries on securities and risk management.

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

PUBLICATIONS

† indicates student or postdoc

SUBMITTED

1. Barcikowska, M.†, **Kapnick, S.**, 2016: Impact of large-scale circulation changes in the North Atlantic sector on the current and future Mediterranean winter hydroclimate. *Submitted*.
2. Tommasi, D., Stock, C., Hobday, A., Methot, R., Kaplan, I, Eveson, J., Holsman, K., Miller, T., Gaichas, S., Gehlen, M., Pershing, A., Vecchi, G., 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., and C. Werner, 2016: Managing living marine resources in a dynamic environment: the role of seasonal to decadal climate forecasts. *Submitted*.
3. van der Wiel, K.†, **Kapnick, S.**, Vecchi, G., 2016: Shifting patterns of mild weather in response to climate change forcing. *Submitted*.
4. van der Wiel, K.†, **Kapnick, S.**, van Oldenborgh, G. J., Whan, K., Philip, S., Vecchi, G. A., Singh, R. K., Arrighi, J., and H. Cullen, 2016: Rapid attribution of the August 2016 flood-inducing extreme precipitation in south Louisiana to climate change, Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-448. *Submitted*.
5. Yang, X., Vecchi, G.A., Jia, L., **Kapnick, S.**, Delworth, T.L., Gudgel, R., Underwood, S., 2016: From failure to success in predicting western United States winter precipitation from large 2015/16 El Niño. *Submitted*.

PEER-REVIEWED JOURNAL ARTICLES

6. Lemoine, D. and **S. Kapnick**, 2016: A Top-Down Approach to Projecting Market Impacts of Climate Change, *Nature Climate Change*, **6**, 51-55, doi:10.1038/nclimate2759.
7. Pascale, S.†, Bordoni, S., **Kapnick, S.**, Vecchi, G., 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.
8. van der Wiel, K.†, **Kapnick, S.**, Vecchi, G., Cooke, W., Delworth, T., Jia, L., Murakami, H., Underwood, S., and Zeng, F., 2016: The resolution dependence of US precipitation extremes in response to CO2 forcing. *Journal of Climate*, **29** (22), 7991-8012.
9. Jia, L., Yang, Z., Vecchi, G.A., Gudgel, R., Delworth, T., Rosati, A., Stern, B., Wittenberg, A.T., 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.
10. 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.
11. Yang, X., Vecchi, G., Gudgel, R., Delworth, T., Zhang, S., Rosati, A., Jia, L., Stern, W., Wittenberg, A., **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.
12. **Kapnick, S.**, Delworth, T., Ashfaq, M., Malyshev, S., Milly, P.C.D., 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.

13. Vecchi, G.A., Delworth, T., Gudgel, R., **Kapnick, S.**, Rosati, A., Zeng, F., Anderson, W., Balaji, V., Jia, L., Kim, H.-S., Krishnamurthy, L., Msadek, R., Stern, W.F., Underwood, S.D., Villarini, G., Wittenberg, A.T., Yang, X., Zhang S., 2014: On the Seasonal Forecasting of Regional Tropical Cyclone Activity. *Journal of Climate*, **27** (21), 7994-8016.
14. **Kapnick, S.** and T. Delworth, 2013: Controls of Global Snow Under a Changed Climate. *Journal of Climate*, **26** (15), 5537-5562.
15. 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.
16. **Kapnick, S.** and A. Hall, 2012: Causes of recent changes in western North American snowpack. *Climate Dynamics*, **38** (9), 1885-1899, doi:10.1007/s00382-011-1089-y.
17. Waliser, D., Kim, J., Xue, Y., Chao, Y., Eldering, A., Fovell, R., Hall, A., Li, Q., Liou, K., 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.
18. 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.
19. 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.
20. **Kapnick, S.** and A. Hall, 2010: Observed climate-snowpack relationships in California and their implications for the future. *Journal of Climate*, **23** (13), 3446-3456.

PEER-REVIEWED GOVERNMENT DOCUMENTS

21. **Kapnick, S.** and A. Hall, 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.
22. Kim, J., Fovell, R., Hall, A., Li, Q., Liou, K., 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.
23. Waliser, D., Kim, J., Xue, Y., Chao, Y., Eldering, A., Fovell, R., Hall, A., Li, Q., Liou, K., McWilliams, J., **Kapnick, S.**, Vasic, R., De Sale, F., 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

† indicates invited

ACADEMIC

- **2016** iSWGR NASA Snow Meeting†; Western States Water Council / NOAA Meeting on S2S†; WCRP Workshop on Model Hierarchies
- **2015** AGU Annual Meeting†; SUNY-Stony Brook†; Western States Water Council / NOAA Meeting on S2S†
- **2014** Max-Planck-Institute for Meteorology and University of Hamburg Institute of Oceanography Joint Seminar†; GEWEX Conference on Global Water and Energy Cycle; SUNY-Albany†
- **2013** AGU Annual Meeting; Rutgers†; NOAA MAPP Webinar†; UNC-Chapel Hill†; NOAA Library Webinar†; Columbia University Lamont-Doherty Earth Observatory†; Yale University†
- **2012** AGU Annual Meeting; DISCCRS†; NCCR Climate Summer School; Princeton University†
- **2011** NOAA GFDL†; UCLA†; AMS Annual Meeting
- **2010** Stevens Institute of Technology†; NASA Goddard Institute for Space Studies†
- **2009** Department of Energy Pacific Northwest National Laboratory†
- **2008** Climate, Ecosystems, and Resources in Eastern California Conference†; California Climate Change Research Conference

SELECTED OUTREACH SINCE 2014

- **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*, 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.†

ACADEMIC COMMITTEES & ADVISING

POSTDOCTORAL RESEARCHERS & RESEARCH ASSOCIATES

- Salvatore Pascale
- Karin van der Wiel (now at KNMI)
- Monika Barcikowska (now at Environmental Defense Fund)

GRADUATE STUDENTS

- Justin Ng (Current PhD Committee Member, Princeton University)
- Arielle Catalano (Current PhD Committee Member, Rutgers University)

UNDERGRADUATE STUDENTS

- Tyler Janoski, School of Environmental and Biological Sciences, Marine Science and Meteorology, Rutgers University, Hollings Scholar and Senior Thesis Co-Advisor, 2016-2017
- Katsuri Shah, Physics, Princeton University, Collaborator on Senior Thesis, 2015-2016
- Melissa Wrzesien, Geological Sciences, University of North Carolina Chapel Hill, Collaborator on Senior Thesis, 2012-2013

SERVICE

BROAD COMMUNITY

- Meeting Design Team for High Mountain Asia Team (HiMAT) Meeting, NASA Goddard Space Flight Center, Greenbelt, MD, 2016
- Honors Committee Member for the Cryosphere Section of the American Geophysical Union, 2016
- Panelist Judge for American Geophysical Union Thriving Earth Exchange, 2015
- Co-founder 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 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 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

- Steering Committee Member and Organizer for NOAA Forums (workshops on present and future research priorities), Oceanic and Atmospheric Research Division, NOAA 2016-Present
- Speaker on the subject of western U.S. snowpack, NOAA Science Days, March 2016
- GFDL Early Career Scientist Committee Member, 2015-2016
- Co-organizer of Climate Variations and Predictability Group Mentoring 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, The Cryosphere, Water Resources Research*
- Proposal Reviewer for: National Science Foundation, NOAA Climate Observations and Monitoring Program, Swiss National Science Foundation

PROPOSALS

FUNDED

- 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, 2016-2019. Principal Investigator, $518,447.

SELECTED MEDIA COVERAGE

- Many Flavors of El Niño Make Prediction Difficult, *Scientific American*, March, 9, 2016.
- El Niño so far has drenched parts of California, but not the south, *U.S. News & World Report*, March, 9, 2016.
- New calculations of rising temperatures paint a dismal picture for economies of poorer nations, *ClimateWire*, August, 18, 2015.
- Why Are Asia's Glaciers Mysteriously Expanding? *Discovery.com*, October 13, 2014.
- Climate Change: Here's What It Really Means For Your Life, *Refinery29*, July 9, 2013.
- Major snow disappoints with minor moisture, *CNN*, March 6, 2013.
- Warming climate could mean bigger blizzards, less snow, *CNN*, February 26, 2013.
- Climate contradiction: Less snow, more blizzards, *Associated Press (e.g. Washington Post, USA Today)*, February 19, 2013.
- Out of Equilibrium? The World's Changing Ice Cover, *Environmental Health Perspectives*, January 1, 2011.