

## RICHARD SEAGER

**E-mail Address:** seager@ldeo.columbia.edu

FAX (845) 365-8736

Work phone:(845) 365-8743

**Home Address**

533 West 112<sup>th</sup> St. Apt. 8A

New York, NY 10025

(212) 666-5618

**Education** LIVERPOOL UNIVERSITY Liverpool, England

October 1980–May 1983

**1983 B. Sc. Honours First Class, Geography**

COLUMBIA UNIVERSITY New York, NY

September 1983– February 1990

**1985 M. A. in Geological Sciences**

**1990 M. Phil. in Geological Sciences**

**1990 Ph. D. in Geological Sciences**

**Ph.D. Thesis:** Modeling sea surface temperature and low level winds in the tropics.

*Advisor:* Professor Mark Cane.

**Employment** March 1990–December 1990. Post-Doctoral Research Scientist at Lamont Doherty Geological Observatory of Columbia University, New York.

January 1991–December 1992. Post-Doctoral Research Scientist at The Joint Institute for Study of the Atmosphere and Ocean, University of Washington, Seattle.

January 1993 to December 1993. National Oceanic and Atmospheric Administration Program in Climate and Global Change Postdoctoral Fellow at Lamont Doherty Earth Observatory of Columbia University, New York.

January 1994 to July 1997. Associate Research Scientist at Lamont Doherty Earth Observatory of Columbia University, Palisades, New York.

July 1997 to July 2000. Research Scientist at Lamont Doherty Earth Observatory of Columbia University, Palisades, New York.

July 2000 to September 2008. Doherty Senior Research Scientist at Lamont Doherty Earth Observatory of Columbia University, Palisades, New York.

September 2008 to June 2010 Palisades Geophysical Institute Senior Research Scientist at Lamont Doherty Earth Observatory of Columbia University, Palisades, New York.

July 2010 to present. Palisades Geophysical Institute/Lamont Research Professor at Lamont Doherty Earth Observatory of Columbia University, Palisades, New York.

January 2011. Appointed member of Earth Institute Faculty.

### Research interests

Climate change and variability on seasonal to glacial timescales, tropical forcing of global climate variations, North American drought, tropical atmosphere-ocean interactions,

tropical climate change, explaining the causes of regional climates, climate modeling, seasonal to decadal climate prediction, global hydroclimate variability and change.

### **Professional service**

NOAA Drought Task Force (2011 to present)  
NOAA CMIP5 Task Force (2012 to 2014)  
US CLIVAR drought working group member (2006 to 2009).  
National Integrated Drought Information System Forecasts and Predictions Working Group (2014 to present)  
Contributing author for Climate Change Science Program Synthesis and Assessment Report, abrupt change chapter (2006 to 2009).  
Associate Editor, *Quarterly Journal of the Royal Meteorological Society* (2005 to 2011)  
Member of the American Meteorological Society Committee on Tropical Meteorology and Hurricanes (1995 to 1999).  
Member of the CLIVAR Pacific panel (1999 to 2001) Member of NOAA Climate and Global Change Postdoctoral Fellowship Committee (2011 to 2013).

### **Awards**

Fellow of the American Meteorological Society, September 2013.  
California Department of Water Resources Climate Science Paper awards for two separate papers, November 2008.  
Lamont Director's Award for Outstanding Research Performance, September 2007.  
National Oceanic and Atmospheric Administration Climate and Global Change Postdoctoral Fellowship, July 1992.

### **Professional Associations**

Member of the Royal Meteorological Society  
Member of The American Meteorological Society.  
Member of the American Geophysical Union.  
Member of the American Association for the Advancement of Science

### **Lamont service**

Executive Committee, elected representative of Ocean and Climate Physics Division, currently in third term  
DEES Graduate Program Committee (2014 to present)  
Served on Storke-Doherty Lectureship, Postdoctoral Fellowship, PGI Junior, LRP and DEES search committees

### **Earth Institute service**

Earth Institute Faculty member, 2011 to present  
EI Appointments and Promotions Committee, 2012 to present  
Chair, EI Appointments and Promotions Committee, 2016 to present  
EI Executive Committee, 2016 to present

### **Graduate students advised (wholly or partially)**

Amy Clement, Sloan Coats, Alessandra Giannini, Arthur Greene, Alicia Karspeck, Julien Emile-Geay, Celine Herweijer, Wenchang Yang, Yutian Wu, Colin Kelley, David Wang,

Nandini Ramesh, Etienne Dunn-Seguín, Madeleine Pascolini-Campbell, Olivia Clifton, Weston Anderson, Bor-Ting Jong, Colleen Baublitz, Hun Baek, Ethan Coiffel, Dan Bishop.

#### Postdoctoral fellows mentored

Nili Harnik (Lamont fellowship), Kris Karnauskas (Lamont fellowship), Jason Smerdon (Lamont fellowship), Ben Cook (NOAA fellowship), Isla Simpson (Lamont fellowship), Jack Scheff (NSF Fellow), Justin Mankin (EI fellow, co-mentored with Smerdon).

#### Undergraduate interns co-authored published papers with

Alexandrina Tzanova, Laura Vogel, Tyler Ruff, Stephanie Jurburg, Tristan Ballard, Allison Hooks, Nathan Lis and Jamie Feldman

#### Editor reviewed, Popular articles, un-refereed articles, encyclopedia entries etc.

- R. Seager and I. R. Simpson, 2016: Western boundary currents and climate change, *J. Geophys. Res.-Oceans*, **121**, doi:10.1002/2016JC012156.
- R. Seager, 2016: Physical mechanisms causing the California drought of 2011-15. *Harvard Review of Environment and Society*, 4-5.
- R. Seager, 2015: Mark Cane: 2014 Fellow of The Oceanography Society, *Oceanography*, **28**, 8-9.
- R. Seager and B. Cook, 2013: The Dust Bowl, *Encyclopedia of Natural Hazards*, Peter Bobrowsky, Ed., Springer, New York, 197-200.
- R. Seager, 2008: Setting the record straight on the Gulf Stream and European climate. *The Plantsman*, the quarterly magazine of the Royal Horticultural Society, **7**, 22-27.
- R. Seager, 2007: Making a bad situation worse: Climate change and human-induced aridification of southwestern North America. California Department of Water Resources *California Drought Update*, June 2008.
- Schubert, S., R. Koster, M. Hoerling, R. Seager, D. Lettenmaier, A. Kumar and D. Gutzler, 2007: Predicting drought on seasonal-to-decadal timescales. *Bull. Amer. Meteor. Soc.*, **88**, 1625-1630.
- R. Seager, 2006: The source of Europe's mild climate, *Am. Sci.*, **94**, 334-341.
- Clement, A.C., J. Emile-Geay, R. Seager, M. Cane and M. N. Evans, 2006: Solar forcing of the tropical Pacific climate and impacts over North America for the last millennium. *PAGES News*, **14**, 12-14.
- R. Seager, 2003: Gulf Stream, la fin d'un mythe. *La Recherche*, **361**, 40-45 (In French).

#### Refereed professional reports

- Sheffield, J., A. Barrett, D. Barrie, S. Camargo, E. Chang, B. Colle, D. Fernando, R. Fu, K. L. Geil, Q. Hu. X. Jiang, N. Johnson, K. Karnauskas, S. Kim, J. Kinter, S. Kumar, B. Langenbrunner, K. Lombardo, L. Long, E. Maloney, A. Mariotti, J. Meyerson, K. Mo, J. D. Neelin, S. Nigam, Z. Pan, T. Ren, A. Ruiz-Barrades, R.

- Seager, Y. Serra, A. Seth, D.-Z. Sun, J. Thibeault, J. Stroeve, C. Wang, S.-P. Xie, Y. Yang, L. Yin, J.-Y. Yu, T. Zhang, M. Zhao, 2014: Regional climate processes and projections for North America: CMIP3/CMIP5 differences, attribution and outstanding issues. NOAA Technical Report OAR CPO-2
- Seager, R., M. Hoerling, S. Schubert, H. Wang, B. Lyon, A. Kumar, J. Nakamura and N. Henderson, 2014: Causes and predictability of the 2011-14 California Drought, NOAA Drought Task Force Narrative Team Assessment Report, <http://cpo.noaa.gov/ClimatePrograms/ModelingAnalysisPredictionsandProjections/MAPPTaskForces/DroughtTaskForce/CaliforniaDrought.aspx>
  - Hoerling, R., S. Schubert, K. Mo, A. AghaKouchak, H. Berbery, J. Dong, A. Kumar, V. Lakshmi, R. Leung, J. Li, X. Liang, L. Luo, B. Lyon, D. Miskus, X. Quan, S. Schubert, R. Seager, S. Sorooshian, H. Wang, Y. Xia, N. Zeng, 2013, An Interpretation of the Origins of the 2012 Central Great Plains Drought, NOAA Drought Task Force Narrative Team Assessment Report, [www.drought.gov/drought/content/resources/reports](http://www.drought.gov/drought/content/resources/reports)
  - Sheffield, J., A. Barrett, D. Barrie, S. Camargo, E. Chang, B. Colie, D. Fernando, R. Fu, K. Geil, Q. Hu, X. Jiang, N. Johnson, K. Karnauskas, S. Kim, J. Kinter, S. Kumar, B. Langenbrunner, K. Lombardo, L. Long, E. Maloney, A. Mariotti, J. Meyerson, K. Mo, J. Neelin, S. Nigam, Z. Pan, T. ren, A. Ruiz-Barradas, R. Seager, Y. Serra, A. Seth, D.-Z. Sun, J. Thibeault, J. Stroeve, C. Wang, S.-P. Xie, Z. Yang, L. Yin, J.-Y. Yu, T. Zhang, M. Zhao, 2014: Regional Climate Processes and Pprojections for North America. CMIP3/CMIP5 Differences, Attribution and Outstanding Issues. *NOAA Technical Report OAR CPO-2*.
  - Cook, E.R., P.J. Bartlein, N. Diffenbaugh, R. Seager, B.N. Shuman, R. S. Webb and C. Woodhouse, 2008, Hydrological variability and change. In *Abrupt Climate Change*, A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. U.S. Geological Survey, Reston, VA, pp. 143-257.
  - Delworth, T.L., P.U. Clark, M. Holland, W.E. Johns, T. Kuhlbrodt, J. Lynch-Stieglitz, C. Morrill, R. Seager, A.J. Weaver, and R. Zhang, 2008: The potential for abrupt change in the Atlantic Meridional Overturning Circulation. In: *Abrupt Climate Change*. A report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. U.S. Geological Survey, Reston, VA, pp. 258-359.

## Refereed publications

- Bishop, D., A. P. Williams, R. Seager, A. M. Fiore, B. I. Cook, J. S. Mankin, D. Singh, J. E. Smerdon and M. P. Rao, 2018: Investigating the causes of increased 20th-century precipitation over the southeastern United States, *J. Climate*, submitted.
- Seager, R., A. P. Williams, J. Nakamura and J. Axelson, 2018: Analysis and modeling of interannual timescale coupling between drought and bark beetles across the American West. *Ecosystems*, submitted.
- Simpson, I.R., P. Hitchcock, R. Seager, Y. Wu and P. Callaghan, 2018: The downward influence of uncertainty in the Northern Hemisphere stratospheric polar vortex response to climate change. *J. Climate*, in press.
- Mankin, J. S., R. Seager, J. E. Smerdon, B. I. Cook, A. P. Williams and R. H. Horton, 2018: Blue water tradeoffs with ecosystems in a  $CO_2$  enriched world. *Geophys. Res. Lett.*, **45**, doi.org/10.1002/2018GL077051.

- Anderson, W., R. Seager, W. Baethgen and M. A. Cane, Trans-Pacific ENSO teleconnections pose a correlated risk to agriculture, *Ag. Forest. Meteor.*, submitted.
- Ting, M., R. Seager, C. Li and H. Liu, 2018: Mechanism of future spring drying in the southwest U.S. in CMIP5 models, *J. Climate*, **31**, 4265-4279.
- Singh, D., R. Seager, B. Cook, M. Cane, M. Ting, E. Cook, M. Davis, 2017: Climate and the great global famine of 1876-78. *J. Climate*, submitted.
- Seager, R., J. Feldman, N. Lis, M. Ting, A. P. Williams, J. Nakamura, H. Liu and N. Henderson, 2018: 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**, DOI:10.1175/EI-D-17-0012.1.
- Seager, R., N. Lis, J. Feldman, M. Ting, A. P. Williams, J. Nakamura, H. Liu and N. Henderson, 2018: 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**, DOI:10.1175/EI-D-17-0011.1.
- Jong, B.-T., M. Ting, R. Seager and D.-E. Lee, 2018: Role of equatorial Pacific SST forecast error in the late winter California precipitation forecast for the 2015/16 El Niño, *J. Climate*, **31**, 839-852.
- Giannini, A., B. Lyon, R. Seager and N. Vignaud, 2018: Dynamical and thermodynamic elements of modeled climate change at the East African margin of convection. *Geophys. Res. Lett.*, **45**, 992-1000, doi: 10.1002/2017GL075486.
- Mankin, J., J. Smerdon, B. I. Cook, A. P. Williams and R. Seager, 2017: The curious case of projected 21st century drying but greening in the American West, *J. Climate*, **30**, 8689-8710.
- Cook, B. I., A.P. Williams, J.S. Mankin, R. Seager, J.E. Smerdon and D. Singh, 2017: Revisiting the leading drivers of Pacific coastal drought variability in the Contiguous United States, *J. Climate*, **31**, 25-43.
- Seager, R., N. Henderson, M.A. Cane, H. Liu and J. Nakamura, 2017: Is there a role for human-driven climate change in the precipitation decline that drove the California drought?, *J. Climate*, **30**, 10237-10258
- Smerdon, J. E. and others, 2017: Comparing proxy and model estimates of hydroclimate variability and change over the Common Era, *Climate of the Past*, **13**, 1851-1900.
- Scheff, J., R. Seager, H. Liu and S. Coats, 2017: Are glacials dry? Consequences for paleoclimatology and for greenhouse warming, *J. Climate*, **30**, 6593-6609.
- Pascolini-Campbell, M., R. Seager, A. Pinson and B. Cook, 2017: Co-variability of climate and streamflow of the upper Rio Grande. *J. Hydrol. Reg. Proc.*, **13**, 58-71.
- Seager, R. and M. Ting, 2017: Decadal drought variability over North America: Mechanisms and predictability, *Curr. Clim. Change Rep.*, DOI 10.1007/s40641-017-0062-1.
- Williams, A.P., B. I. Cook, J. E. Smerdon, D. A. Bishop and R. Seager, 2017: The 2016 southeastern US drought: an extreme departure from centennial wetting and cooling, *J. Geophys. Res.-Atmos.*, doi:10.1002/2017JD027523.
- Baek, H. S., J. E. Smerdon, S. Coats, A. P. Williams, B. I. Cook, E. R. Cook and R. Seager, 2017: Precipitation, temperature, and teleconnection signals across the combined North American, Monsoon Asia, and Old World Drought Atlases, *J. Climate*, **30**, 7141-7155.

- Anderson, W., R. Seager, W. Baethgen and M. Cane, 2017: Crop production variability in North and South America forced by life-cycles of the El Niño Southern Oscillation, *Ag. Forest. Meteor.*, **239**, 151-165.
- Biasutti, M., R. Seager and D. Kirschbaum, 2017: Landslides in West Coast Metropolitan areas: the role of extreme weather events, *Weather and Climate Extremes*, **14**, 67-79.
- Seager, R. and N. Henderson, 2016: On the role of tropical ocean forcing of the persistent North American west coast ridge of winter 2013/14. *J. Climate*, **29**, 8027-8049.
- Coats, S., K. Karlsrukas, J. Smerdon and R. Seager, 2016: The improbable but unexceptional occurrence of megadrought clustering in the American West during the Medieval Climate Anomaly. *Env. Res. Lett.*, **11**, 074025, doi:10.1088/1748-9326/11/7/074025.
- Jong, B., M. Ting and R. Seager, 2016: El Niño's impact on California precipitation: Seasonality, regionality and El Niño intensity. *Env. Res. Lett.*, **11**, 054021, doi:10.1088/1748-9326/11/5/054021.
- Coats, S., J. Smerdon, B. Cook, R. Seager, E. Cook and K. Anchukaitis, 2016: Internal ocean-atmosphere variability drives megadroughts in Western North America, *Geophys. Res. Lett.*, **43**, 98869894, doi:10.1002/2016GL070105..
- Anderson, W., R. Seager, W. Baethgen and M. Cane, 2016: Life cycles of agriculturally-relevant ENSO teleconnections in North and South America, *Int. J. Climatol.*, DOI: 10.1002/joc.4916..
- Ramesh, N., M. Cane and R. Seager, 2016: Predictability and prediction of persistent cool states of the tropical Pacific Ocean, 2015: *Clim. Dyn.*, DOI 10.1007/s00382-016-3446-3.
- Schubert, S. D. and R. E. Stewart and H. Wang and M. Barlow and E. Berberry and W. Cai and M. P. Hoerling and K. K. Kanikicharla and R. D.Koster and B. Lyon and A. Mariotti and C. R. Mechoso and O. V. Muller and B. Rodriguez-Fonseca and R. Seager and S. I. Senevirante and L. Zhang and T. Zhou, 2016: Global meteorological drought: A synthesis of current understanding with a focus on SST drivers of precipitation deficits, *J. Climate*, **29**, 3989-4019.
- Greene, A. M. and R. Seager, 2016: Categorical representation of North American precipitation projections, *Nature Sci. Rep.*, DOI: 10.1038/srep23888.
- Cook, B., E. Cook, J. E. Smerdon, R. Seager, A. P. Williams, S. Coats, D. W. Stahle and J. Villanueva-Diaz, 2016: North American megadroughts in the Common Era: reconstructions and simulations, *WIREs Clim. Change* doi: 10.1002/wcc.394.
- Cook, E. R., R. Seager, Y. Kushnir, K. Briffa, U. Buntgen, D. Frank, P. Krusic, W. Tegel, G. van der Schrier, L. Andreu-Hayles, M. Baillie, C. Baittinger, A. Billamboz, N. Bleicher, N. Bonde, D. Brown, M. Carrer, R. Cooper, K. Cufar, C. Dittmar, J. Esper, C. Giggs, B. Gunnarson, B. Gunther, E. Gutierrez, K. Haneca, S. Helema, F. Herzig, K.-U. Heussner, J. Hofman, P. Janda, R. Kontic, N. Kose, T. Kyncl, T. Levanic, H. Linderholm, S. Manning, T. Melvin, D. Miles, B. Neuwirth, K. Nicolussi, P. Nola, M. Panayotov, I. Popa, A. Rothe, K. Seftigen, A. Seim, H. Svarva, M. Svoboda, T. Thun, M. Timonen, R. Touchan, V. Trotsiuk, V. Truet, F. Walder, T. Wazny, R. Wilson, C. Zang, 2015: Old World megadroughts and pluvials during the Common Era, *Science Adv.*, doi:10.1126/sciadv.1500561.
- Williams, A. P., R. Seager, J. T. Abatzoglou, B. I. Cook, J. E. Smerdon and E. R. Cook, 2015: Contribution of anthropogenic warming to the 2012-14 California drought, *Geophys. Res. Lett.*, 10.1002/2015GL063266.

- Coats, S., B. I. Cook, J. E. Smerdon and R. Seager, 2015: Winter-to-summer precipitation phasing in southwestern North America: A multi-century perspective from paleoclimatic model-data comparisons, *J. Geophys. Res.*, **120**, 8052-8064, doi:10.1002/2015JD023085.
- Yang, W., R. Seager, M. A. Cane and B. Lyon, 2015: The rainfall annual cycle bias over East Africa induced by CMIP5 coupled climate models. *J. Climate*, **28**, 9789-9802.
- Simpson, I., R. Seager, M. Ting and T. Shaw, 2015: Causes of change in Northern Hemisphere winter meridional wind and regional hydroclimate, *Nature Clim. Change*, DOI: 10.1038/NCLIMATE2783.
- Seager, R., M. Hoerling, S. Schubert, H. Wang, B. Lyon, A. Kumar, J. Nakamura and N. Henderson, 2015: Causes of the 2011-14 California Drought, *J. Climate*, **28**, 6997-7024, DOI:10.1175/JCLI-D-14-00860.1.
- Biasutti, M. and R. Seager 2015: Projected changes in U.S. erosivity. *Hydrol. Earth Syst. Sci.*, doi:10.5194/hessd-12-1469-2015.
- Williams, A. P., R. E. Schwartz, S. Iacobellis, R. Seager, B. I. Cook, C. J. Still, G. Husak and J. Michaelsen, 2015: Urbanization causes increased cloud base height and decreased fog in coastal Southern California. *Geophys. Res. Lett.*, **42**, 15271536, doi: 10.1002/2015GL063266.
- Coats, S., B. I. Cook, J. E. Smerdon and R. Seager, 2015: North American Pan-Continental Drought in Model Simulations of the Last Millennium, *J. Climate*, **28**, 2025-2043.
- Smerdon, J. E., B. I. Cook, E. R. Cook and R. Seager, 2015: Bridging past and future climate across models and observations: A hydroclimate case study. *J. Climate*, **28**, 3212-3231.
- Seager, R., A. Hooks, A. P. Williams, B. I. Cook and J. Nakamura, 2015: Climatology, variability and trends in the U.S. vapor pressure deficit, an important fire-related meteorological variable. *J. Appl. Meteor. Clim.*, **54**, 1121-1141.
- Pascolini-Campbell, M. A., R. Seager, D. Gutzler, B. Cook, D. Griffin, 2015: Causes of interannual to decadal variability of Gila River streamflow over the past century. *J. Hydrol. Reg. Stud.*, **3**, 494-508.
- Yang, W., R. Seager, M. A. Cane and B. Lyon, 2015: The annual cycle of East African precipitation. *J. Climate*, **28**, 2385-2404.
- Simpson, I., R. Seager, T. Shaw and M. Ting, 2015: Mediterranean summer climate and the importance of Middle East topography. *J. Climate*, **28**, 1977-1996.
- Seager, R. 2015: Decadal hydroclimate variability across the Americas. In *Climate Change, Multidecadal and Beyond*, C.-P. Chang, M. Ghil, M. Latif and J. M. Wallace, Eds., World Scientific Publishing Co., Singapore, ISBN:978-981-4579-92-6, 4, pp235-253.
- Coats, S., J. E. Smerdon, B. I. Cook and R. Seager, 2015: Are simulated megadroughts in the North American southwest forced? *J. Climate*, **28**, 124-142.
- Kelley, C., S. Mohtadi, M. Cane, R. Seager and Y. Kushnir, 2015: Climate change in the Fertile Crescent and implications of the recent Syrian drought. *Proc. Nat. Acad. Sci.*, doi/10.1073/pnas.1421533112.
- Ballard, T., R. Seager, J. E. Smerdon, B. I. Cook, A. J. Ray, B. Rajagopalan, Y. Kushnir, J. Nakamura, N. Henderson, 2014: Hydroclimate variability and change in the Prairie Potholes Region: The "duck factory" of North America, *Earth Interactions*, **14**, DOI: 10.1175/EI-D-14-0004.1.

- Cook, B. I., R. Seager and J. E. Smerdon, 2014: The worst North American drought year of the last millennium: 1934. *Geophys. Res. Lett.*, **41**, DOI: 10.1002/2014GL061661.
- Seager, R., D. Neelin, I. Simpson, H. Liu, N. Henderson, T. Shaw, Y. Kushnir and M. Ting, 2014: Dynamical and thermodynamical causes of large-scale changes in the hydrological cycle over North America in response to global warming. *J. Climate*, **27**, 7921-7948.
- Kang, S., R. Seager, D. Frierson and X. Liu, 2014: Croll revisited: Why is the northern hemisphere warmer than the southern hemisphere? *Clim. Dyn.*, doi:10.1007/s00382-014-2147-z.
- Simpson, I., T. Shaw and R. Seager, 2014: A diagnosis of the seasonally and longitudinally varying mid-latitude circulation response to global warming. *J. Atmos. Sci.*, **71**, 2489-2515.
- Cook, B., J. Smerdon, R. Seager and S. Coats, 2014: Global warming and 21st century drying. *Clim. Dyn.*, **43**, 2607-2627, doi:10.1007/s00382-014-2075-y.
- Yang, W., R. Seager, M. Cane and B. Lyon, 2014: The East African long rains in observations and models. *J. Climate*, **27**, 7185-7202.
- Seager, R., H. Liu, N. Henderson, I. Simpson, C. Kelley, T. Shaw, Y. Kushnir and M. Ting, 2014: Causes of increasing aridification of the Mediterranean region in response to rising greenhouse gases. *J. Climate*, **27**, 4655-4676.
- Seager, R. and M. P. Hoerling, 2014: Atmosphere and ocean origins of North American droughts, *J. Climate*, **27**, 4581-4606.
- Williams, A. P., R. Seager, M. Berkelhammer, A. K. Macaladay, M. A. Crimmins, T. W. Swetnam, A. T. Trugman, N. Buening, N. Hyrniw, N. G. McDowell, D. Noone, C. I. Mora, T. Rahn, 2014: Causes and implications of extreme atmospheric moisture demand during the record-breaking 2011 wildfire season in the southwest United States, *J. App. Meteor. Clim.*, **53**, 2671-2684.
- Williams, A. P., R. Seager, A. K. Macaladay, M. Berkelhammer, M. A. Crimmins, T. W. Swetnam, A. T. Trugman, N. Buening, D. Noone, N. G. McDowell, N. Hyrniw, C. I. Mora, T. Rahn, 2014: Correlations between components of the water balance and burned area reveal new insights for predicting forest-fire area in the southwest United States, *Int. J. Wildland Fire*, <http://dx.doi.org/10.1071/WF14023>.
- Seager, R., L. Goddard, J. Nakamura, N. Henderson, D. Lee, 2014: Dynamical causes of the 2010/11 first year of the Texas-northern Mexico drought. *J. Hydromet.*, **15**, 39-68.
- Hoerling, M., J. Eischeid, A. Kumar, R. Leung, A. Mariotti, K. Mo, S. Schubert and R. Seager, 2014: Causes and Predictability of the 2012 Great Plains Drought. *Bull. Amer. Meteor. Soc.*, **95**, 269-282.
- Maloney, E.D. and others, 2014: North American Climate in CMIP5 Experiments: Part III: Assessment of 21st Century Projections. *J. Climate*, **27**, 2230-2270.
- Cook, B. I., J. E. Smerdon, R. Seager and E. R. Cook, 2014: Pan-continental droughts in North America over the last millennium. *J. Climate*, **27**, 383-397.
- Sheffield, J. and others, 2013: North American Climate in CMIP5 Experiments. Part II: Evaluation of historical simulations of intra-Seasonal to decadal variability. *J. Climate*, **26**, 9247-9290.
- Coats, S., J.E. Smerdon, B. I. Cook, R. Seager, 2013: Stationarity of the tropical Pacific teleconnection to North America in CMIP5/PMIP3 Model Simulations, *Geophys. Res. Lett.*, **40**, doi:10.1002/grl.50938.

- Sheffield, J. and others, 2013: North American Climate in CMIP5 Experiments. Part I Evaluation of historical simulations of continental and regional climatology. *J. Climate*, **26**, 9209-9245.
- Seager, R. and N. Henderson, 2013: Diagnostic computation of moisture budgets in the ERA-Interim Reanalysis with reference to analysis of CMIP-archived atmospheric model data. *J. Climate*, **26**, 7876-7901.
- Gonzalez, P., L. Polvani, R. Seager and G. Correa, 2013: Stratospheric ozone depletion: a key driver of recent precipitation trends in South Eastern South America. *Clim. Dyn.*, doi:10.1007/s00382-013-1777-x.
- Frierson, D. Y.-T. Hwang, N. Fuckar, R. Seager, S. M. Kang, A. Donahue, E. A. Maroon, X. Liu, D. S. Battisti, 2013: Contribution of ocean overturning circulation to tropical rainfall peak in the Northern Hemisphere, *Nature Geoscience*, **6**, 940-944.
- Tierney, J., J. Smerdon, K. Anchukaitis and R. Seager, 2013: Multidecadal variability in East African hydroclimate controlled by the Indian Ocean. *Nature*, **439**, 389-392.
- Coats, S., J. Smerdon, R. Seager, B. Cook and J. F. Gonzalez-Rpuco, 2013: Megadroughts in southwest North America in ECHO-G millennial simulations and their comparison to proxy drought reconstructions. *J. Climate*, **26**, 7635-7649.
- Yang, W., R. Seager and M. A. Cane, 2013: Zonal momentum balance in the tropical atmospheric circulation during the global monsoon mature months. *J. Atmos. Sci.*, **70**, 583-599.
- Cook, B. I. and R. Seager, 2013: The response of the North American Monsoon to increased greenhouse gas forcing. *J. Geophys. Res. (Atmospheres)*, **118**, 1690-1699.
- Seager, R., M. Ting, C. Li, N. Naik, B. Cook, J. Nakamura and H. Liu, 2013: Projections of declining surface-water availability for the southwestern United States. *Nature Climate Change*, **3**, 482-486.
- Williams, A.P., C. D. Allen, A. K. Macalady, D. Griffin, C. Woodhouse, D. Meko, T. Swetnam, S. Rauscher, R. Seager, H. Grissino-Mayer, J. Dean, E.R. Cook, C. Gangodagamage, M. Cai and N. McDowell, 2013: Temperature as a potent driver of regional forest drought stress and tree mortality, *Nature Climate Change*, **3**, 292-297.
- Wu, Y., L. Polvani and R. Seager, 2013: The importance of the Montreal Protocol for protecting the Earth's hydroclimate. *J. Climate*, **26**, 4049-4068.
- Nakamura, J., U. Lall, Y. Kushnir, A. Robertson and R. Seager, 2013: Dynamical structure of major floods in the U.S. Midwest and the United Kingdom. *J. Hydromet.*, **14**, 485-504.
- Wu, Y., R. Seager, T. Shaw, M. Ting and N. Naik, 2013: Atmospheric circulation response to an instantaneous doubling of carbon dioxide. Part II: Atmospheric transient adjustment and its dynamics. *J. Climate*, **26**, 918-935.
- Karneckas, K., R. Seager, A. Giannini and A. Busalacchi, 2013: A simple mechanism for the climatological mid-summer drought along the Pacific coast of Central America. *Atmosfera*, **26**, 261-281.
- Cook, B. I., R. Seager, R. L. Miller and J.A. Mason, 2013: Intensification of North American megadroughts through surface and dust aerosol forcing. *J. Climate*, **26**, 4414-4430.
- Kelley, C., M. Ting, R. Seager and Y. Kushnir, 2012: Mediterranean precipitation climatology, seasonal cycle, and trend as simulated by CMIP5. *Geophys. Res. Lett.*, doi:10.1029/2012GL053416.

- Karlsrukas, K, J. E. Smerdon, R. Seager and J. F. Gonzalez-Rouco, 2012: A Pacific centennial oscillation predicted by coupled GCMs. *J. Climate*, **25**, 5943-5961.
- Seager, R., N. Pederson, Y. Kushnir, J. Nakamura and S. Jurburg, 2012: The 1960s drought and subsequent shift to a wetter climate in the Catskill Mountains region of the New York City watershed. *J. Climate*, **25**, 6721-6742.
- Pederson, N., A. Bell, E. Cook, U. Lall, N. Devenini, R. Seager, K. Eggeleston and K. Vranes, 2012: Is an epic pluvial masking the water insecurity of the greater New York City region? *J. Climate*, **26**, 1339-1354.
- Seager, R., N. Naik and L. Vogel, 2012: Does global warming cause intensified interannual hydroclimate variability?, *J. Climate*, **25**, 3355-3372.
- Wu, Y., R. Seager, M. Ting, N. Naik and T. Shaw, 2012: Atmospheric circulation response to an instantaneous doubling of carbon dioxide. Part I: Model experiments and transient thermal response in the troposphere. *J. Climate*, **25**, 2862-2879.
- Seager, R. and N. Naik, 2012: A mechanisms-based approach for detecting recent anthropogenic hydroclimate change. *J. Climate*, **25**, 236-261.
- Ruff, T., Y. Kushnir and R. Seager, 2012: Comparing Twentieth and Twenty-First Century patterns of interannual precipitation variability over the western United States and northern Mexico. *J. Hydrometeorol.*, **13**, 366-378.
- Kelley, C., M. Ting, R. Seager and Y. Kushnir, 2011: The relative roles of natural variability and forced change in causing the late 20<sup>th</sup> Century drying of the Mediterranean region. *Clim. Dyn.*, doi:10.1007/s00382-011-1221.
- Cook, B., R. Seager and R. Miller, 2011: The causes and dynamics of the early 20<sup>th</sup> Century North American pluvial. *J. Climate*, **24**, 5043-5060.
- Ting, M., Y. Kushnir, R. Seager, and C. Li, 2011: Robust features of Atlantic multi-decadal variability and its climate impacts, *Geophys. Res. Lett.*, **38**, L17705, doi:10.1029/2011GL048712.
- Seager, R. and R. Burgman, 2011: Medieval hydroclimate revisited. *PAGES*, **19**, 10-12.
- D'Arrigo, R., R. Seager, J. Smerdon, A. LeGrande and E. Cook 2011: Winter 1783-1784: Was Laki or an analog of winter 2009/10 to blame? *Geophys. Res. Lett.*, **38**, doi:10.1029/2011GL046696.
- Cook, B., R. Seager and R. Miller, 2011: Impact of devegetated dune fields on North American climate during the Medieval Climate Anomaly. *Geophys. Res. Lett.*, **38**, doi:10.1029/2011GL047566.
- Seager, R., N. Naik, W. Baethgen, A. Robertson, Y. Kushnir, J. Nakamura and S. Jurburg, 2010: Tropical oceanic causes of interannual to multidecadal precipitation variability in southeast South America over the past century. *J. Climate*, **23**, 5517-5539.
- Cook, B., E. Cook, K. Anchukaitis, R. Seager and R. Miller, 2010: Forced and unforced variability of 20th Century North American droughts and pluvials. *Clim. Dyn.*, doi:10/1007/s00382-010-0897-9.
- Cook, B., R. Seager and R. Miller, 2010: Atmospheric circulation anomalies during two persistent North American droughts: 1932-1939 and 1948-1957. *Clim. Dyn.*, **36**, 2339-2355
- Harnik, N., R. Seager, N. Naik, M. Cane and M. Ting, 2010: The role of linear wave refraction in the transient eddy-mean flow response to tropical Pacific SST anomalies. *Quart. J. Roy. Meteor. Soc.*, **136**, 2132-2146.

- Seager, R. and G. Vecchi, 2010: Greenhouse warming and the 21st century hydroclimate of southwestern North America. *Proc. Nat. Acad. Sci.*, **107**, 21277-21282.
- Kushnir, Y., R. Seager, M. Ting, N. Naik and J. Nakamura, 2010: Mechanisms of tropical Atlantic SST influence on North American precipitation variability. *J. Climate*, **23**, 5610-5628.
- Seager, R., N. Naik and G. Vecchi, 2010: Thermodynamic and dynamic mechanisms for large-scale changes in the hydrological cycle in response to global warming. *J. Climate*, **23**, 4651-4668.
- Seager, R., Y. Kushnir, J. Nakamura, M. Ting and N. Naik, 2010: Northern hemisphere winter snow anomalies: ENSO, NAO and winter of 2009/10. *Geophys. Res. Lett.*, **37**, doi:10.1029/2010GL043830.
- Wu, Y., M. Ting, R. Seager, H.-P. Huang and M. Cane, 2010: Changes in storm tracks and energy transports in a warmer climate simulated by the GFDL CM2.1 model. *Clim. Dyn.*, doi:10.1007/s00382-010-0776-4.
- Burgman, R., R. Seager, A. C. Clement and C. Herweijer, 2010: Role of tropical Pacific SSTs in global medieval hydroclimate: A modeling study. *Geophys. Res. Lett.*, **37**, doi:10.1029/2009GL042239.
- Seager, R., N. Naik, M. Ting, N. Harnik, M. Cane and Y. Kushnir, 2010: Adjustment of the atmospheric circulation to tropical Pacific SST anomalies: Variability of transient eddy propagation in the Pacific North-America sector. *Quart. J. Royal Meteor. Soc.*, **136**, 277-296.
- Schubert, S. and 32 others (incl. R. Seager), 2009: A U.S. CLIVAR project to assess and compare the responses of global climate models to drought-related SST forcing patterns: Overview and results. *J. Climate*, **22**, 5251-5272
- Cook, E. R., R. Seager, R. R. Heim, R. S. Vose, C. Herweijer, C. Woodhouse, 2010: Megadroughts in North America: Placing IPCC projections of hydroclimatic change in a long term paleoclimatic context. *J. Quat. Sci.*, **25**, 48-61.
- Cook, B., R. Miller and R. Seager, 2009, Amplification of the North American Dust Bowl drought through human-induced land surface degradation. *Proc. Nat. Acad. Sci.*, **106**, 4997-5001.
- Seager, R., A. Tzanova and J. Nakamura 2009: Drought in the southeastern United States: Causes, variability over the last millennium and the potential for near future hydroclimate change. *J. Climate*, **22**, 5021-5045.
- Stahle, D.W., E. R. Cook, J. Villanueva Diaz, F. K. Fye, D. J. Burnette, R. D. Griffin, R. Acuña-Soto, R. Seager and R. R. Heim, 2009: Early 21st Century drought in Mexico. EOS Transactions of the American Geophysical Union, **90**, 89-90.
- Ting, M., Y. Kushnir, R. Seager, C. Li, 2009: Forced and internal 20th Century SST changes in the North Atlantic. *J. Climate*, **22**, 1469-1481.
- Karneckas, K., R. Seager, A. Kaplan, Y. Kushnir and M. A. Cane, 2009: Observed strengthening of the zonal sea surface temperature gradient across the equatorial Pacific Ocean, *J. Climate*, **22**, 4316-4321.
- Seager, R., M. Ting, M. Davis, M. Cane, N. Naik, J. Miller, C. Li, E.R. Cook and D.W. Stahle, 2009: Mexican drought: An observational, modeling and tree ring reconstruction study of variability and climate change. *Atmosfera*, **22**, 1-31.
- Cook, B., R. Miller and R. Seager, 2008: Dust and sea surface temperature forcing of the 1930s 'Dust Bowl' drought. *Geophys. Res. Lett.*, **35**, doi:10.1029/2008GL033486.

- Seager, R., R. Burgman, Y. Kushnir, A. C. Clement, E. R. Cook, N. Naik and J. Miller, 2008: Tropical Pacific forcing of North American Medieval megadroughts; Testing the concept with an atmosphere model forced by coral-reconstructed SSTs *J. Climate*, **21**, 6175-6190.
- Seager, R., Y. Kushnir, M. Ting, M. Cane, N. Naik and J. Miller, 2008: Would advance knowledge of 1930s SSTs have allowed prediction of the Dust Bowl drought? *J. Climate*, **21**, 3261-3281
- Emile-Geay, J., R. Seager, M. A. Cane, G. H. Haug and E. R. Cook 2008: Volcanoes and ENSO over the last millennium, *J. Climate*, **21**, 3134-3138.
- Herweijer, C. and R. Seager, 2008: The global footprint of persistent extra-tropical drought in the instrumental era. *Int. J. Climatol.*, doi:10.1002/joc.1590.
- Murtugudde, R., R. Seager and P. Thoppil, 2008: Arabian Sea response to monsoon variations. *Paleoceanogr.*, bf 22, doi:10.1029/2007PA001467.
- Seager, R., M. Ting, I. M. Held, Y. Kushnir, J. Lu, G. Vecchi, H.-P. Huang, N. Harnik, A. Leetmaa, N.-C. Lau, C. Li, J. Velez and N. Naik, 2007: Model projections of an imminent transition to a more arid climate in southwestern North America, *Science*, **316**, 1181-1184.
- Seager, R., N. E. Graham, C. Herweijer, A. Gordon, Y. Kushnir and E. Cook, 2007: Blueprints for Medieval hydroclimate. *Quat. Sci. Rev.*, **26**, 2322-2336.
- Emile-Geay, J., M.A. Cane, R. Seager, A. Kaplan and P. Almasi, 2007: El Niño as a mediator of the solar influence on climate, *Paleoceanogr.*, **22**, doi:10.1029/2006PA001304.
- Seager, R., 2007: The turn of the century North American drought: Global context, dynamics and past analogues. *J. Climate*, **20**, 5527-5552.
- Herweijer, C., R. Seager and E. R. Cook, 2007: North American droughts of the last millennium from a gridded network of tree ring data. *J. Climate*, **20**, 1353-1376.
- Cook, E.R., R. Seager, M.A. Cane and D. W. Stahle, 2007: North American droughts: reconstructions, causes and consequences. *Earth Sci. Rev.*, **81**, 93-134.
- Seager, R. and D. S. Battisti, 2007: Challenges to our understanding of the general circulation: Abrupt climate change. *The General Circulation of the Atmosphere*, T. P. Schneider and A.S. Sobel, Eds., Princeton University Press, pp 331-371.
- Herweijer, C., R. Seager and E. R. Cook, 2006: North American Droughts of the mid to late Nineteenth Century: A history, model simulation and implications for Medieval megadrought. *The Holocene*, **16**, 159-171.
- Huang, H.-P., R. Seager and Y. Kushnir, 2005: The 1976/77 transition in precipitation over the Americas and the influence of tropical SST. *Clim. Dyn.*, **24**, 721-740.
- Seager, R., Y. Kushnir, C. Herweijer, N. Naik and J. Velez, 2005: Modeling of tropical forcing of persistent droughts and pluvials over western North America: 1856-2000. *J. Climate*, **18**, 4068-4091.
- Clement, A. C., R. Seager and R. Murtugudde, 2005: Why are there tropical warm pools? *J. Climate*, **18**, 5294-5311.
- Hazeleger, W., C. Severijns, R. Seager and F. Molteni, 2005: Tropical Pacific-driven decadal energy transport variability. *J. Climate*, **18**, 2037-2051.
- Herweijer, C., R. Seager and M. Winton, 2005: Why ocean heat transport warms the global mean climate. *Tellus*, **57A**, 662-675.
- Seager, R., W. A. Robinson, N. Harnik, Y. Kushnir, M. Ting, H. Huang and J. Velez, 2005: Mechanisms of ENSO-forcing of hemispherically symmetric precipitation variability. *Q. J. Royal. Meteorol. Soc.*, **131**, 1501-1527.

- Karspeck, A., R. Seager and M. Cane, 2004: Predictability of tropical Pacific decadal variability in an intermediate model. *J. Climate*, **17**, 2842-2850.
- Seager, R., A. Karspeck, M. Cane, Y. Kushnir, A. Giannini, A. Kaplan, B. Kerman and J. Miller, 2004: Predicting Pacific decadal variability, In *Earth Climate: The ocean-atmosphere interaction*, C. Wang, S.-P. Xie and J. A. Carton, Eds., 105-120.
- Hazeleger, W., R. Seager, M. A. Cane and N. Naik, 2004: How can tropical Pacific ocean heat transport vary? *J. Phys. Oceanogr.*, **24**, 320-333.
- Seager, R., R. Murtugudde, A. C. Clement and C. Herweijer, 2003: Why is there an evaporation minimum at the Equator? *J. Climate*, **16**, 3792-3801.
- Seager, R., N. Harnik, Y. Kushnir, W. A. Robinson and J. Miller, 2003: Mechanisms of hemispherically symmetric climate variability. *J. Climate*, **16**, 2960-2978.
- Seager, R., R. Murtugudde, N. Naik, A. Clement, N. Gordon and J. Miller, 2003: Air-sea interaction and the seasonal cycle of the subtropical anticyclones. *J. Climate*, **16**, 1948-1966.
- Kushnir, Y., R. Seager, J. Miller and J. Chiang, 2002: A simple model of tropical Atlantic decadal climate variability. *Geophys. Res. Letters*, **29**, 10.1029/2002GLO15874.
- Greene, A. M., Seager, R. and W. S. Broecker, 2002: Tropical snowline depression at the Last Glacial Maximum: comparison of coral and groundwater records. *J. Geophys. Res.-Atmospheres*, 10.1029/2001JD000670.
- Seager, R., D. Battisti, J. Yin, N. Naik, N. Gordon, A. C. Clement and M. A. Cane, 2002: Is the Gulf Stream responsible for Europe's mild winters?. *Quart J. Royal Meteor. Soc.*, **128**, 2563-2586.
- Seager, R., Y. Kushnir, N. Naik, M. A. Cane and J. Miller 2001: Wind-driven shifts in the latitude of the Kuroshio-Oyashio extension and generation of SST anomalies on decadal timescales. *J. Climate*, **14**, 4249-4265.
- Clement, A. C., M. A. Cane and R. Seager, 2001: An orbitally forced tropical trigger for abrupt climate change. *J. Climate*, **14**, 2369-2375.
- Giannini, A., J. C. H. Chiang, M. A. Cane, Y. Kushnir and R. Seager, 2001: The ENSO teleconnection to the tropical Atlantic Ocean: contributions of the remote and local SSTs to rainfall variability in the tropical Americas. *J. Climate*, **14**, 4530-4544.
- Seager, R., Y. Kushnir, P. Chang, N. Naik, J. Miller and W. Hazeleger, 2001: Looking for the role of the ocean in tropical Atlantic decadal climate variability. *J. Climate*, **14**, 638-655.
- Hazeleger, W., R. Seager, M. Visbeck, N. Naik and K. Rodgers, 2001: On the impact of the mid-latitude stormtrack on the upper Pacific. *J. Phys. Oceanogr.*, **31**, 616-636.
- Clement, A. C., R. Seager and M. A. Cane, 2000: Suppression of El Niño during the mid-Holocene by changes in the Earth's orbit. *Paleoceanogr.*, **15**, 731-737.
- Seager, R., Y. Kushnir, M. Visbeck, N. Naik, J. Miller, G. Krahnemann and H. Cullen, 2000: Causes of Atlantic Ocean climate variability between 1958 and 1998. *J. Climate*, **13**, 2845-2862.
- Seager R., Clement, A. C. and M. A. Cane, 2000: Glacial cooling in the tropics: exploring the roles of tropospheric water vapor, surface wind speed and boundary layer processes. *J. Atmos. Sci.*, **57**, 2144-2157.

- Clement, A. C., R. Seager and M. A. Cane, 1999: Orbital controls on ENSO and the tropical climate. *Paleoceanogr.*, **14**, 441-456.
- Clement, A. C. and R. Seager, 1999: Climate and the tropical oceans. *J. Climate*, **12**, 3383-3401.
- Clement, A. C., M. A. Cane and R. Seager, 1998: Patterns and mechanisms of Twentieth Century climate change. *World Resource Review*, **10**, 161-185.
- Cane, M. A., A. C. Clement, A. Kaplan, Y. Kushnir, R. Murtugudde, D. Pozdnyakov, R. Seager and S. E. Zebiak, 1997: Twentieth century sea surface temperature trends. *Science*, **275**, 957-960.
- T. Stockdale, A. J. Busalacchi, D. E. Harrison and R. Seager, 1998: Ocean modeling of ENSO. *J. Geophys. Res.*, **103**, 14325-14355.
- R. Seager and R. Murtugudde, 1997: Ocean dynamics, thermocline adjustment and regulation of tropical SST. *J. Climate*, **10**, 521-534.
- A. C. Clement, R. Seager, M. A. Cane and S. E. Zebiak, 1996: An ocean dynamical thermostat. *J. Climate*, **9**, 2190-2196.
- R. Murtugudde, R. Seager and A. J. Busalacchi, 1996: Simulation of the tropical oceans with an ocean GCM coupled to an atmospheric mixed layer model. *J. Climate*, **9**, 1795-1815.
- R. Seager, Y. Kushnir and M. A. Cane, 1995: On heat flux boundary conditions for ocean models. *J. Phys. Oceanogr.*, **12**, 3219-3230.
- R. Seager, M. B. Blumenthal and Y. Kushnir, 1995: An advective atmospheric mixed layer model for ocean modeling purposes: Global simulation of surface heat fluxes. *J. Climate*, **8**, 1943-1957.
- Seager, R. and Zebiak, S. E., 1995: Simulation of tropical climate with a linear primitive equation model. *J. Climate*, **8**, 2497-2520.
- Seager, R. and M. B. Blumenthal, 1994: Modeling tropical Pacific sea surface temperature with satellite derived solar radiative forcing. *J. Climate*, **7**, 1943-1957.
- Seager, R. and Zebiak, S. E., 1994: Convective interaction with dynamics in a linear primitive equation model. *J. Atmos. Sci.*, **51**, 1307-1331.
- Seager, R., 1991: A simple model of the climatology and variability of the low level wind field in the tropics. *J. Climate*, **4**, 164-179.
- Seager, R., 1989: Modeling tropical Pacific sea surface temperature: 1970-1987. *J. Phys. Oceanogr.*, **19**, 419-434.
- Seager, R., Zebiak, S. E. and Cane, M. A., 1988: A model of the tropical Pacific sea surface temperature climatology. *J. Geophys. Res.*, **93**, 1265-1280.