

CONTACT INFORMATION	Department of Atmospheric and Oceanic Sciences University of California, Los Angeles 7343 Math Sciences Building Los Angeles, CA 90095 USA	<i>Phone:</i> (310) 206-5257 <i>Fax:</i> (310) 206-5219 <i>E-mail:</i> sun@atmos.ucla.edu <i>Web:</i> www.atmos.ucla.edu/~sun
RESEARCH INTERESTS	Regional Climate Variability and Change, Climate Dynamics and Modeling, Dynamical and Statistical Downscaling, Climate Change Impacts and Sustainability, Weather and Climate Extremes, Data Analysis, Statistics and Probability	
EDUCATION	University of California, Irvine , Irvine, California USA	
	Ph.D. , Earth System Science (Climate Dynamics)	07/2008
	• Dissertation Title: “ENSO decadal modulation and tropical Pacific mean climate”	
	M.S. , Earth System Science	07/2005
	• Thesis Topic: “Impacts of Central America gap winds on the SST annual cycle in the eastern Pacific warm pool”	
	Nanjing University , Nanjing, China	
	B.S. , Atmospheric Sciences	07/2000
RESEARCH EXPERIENCE	Assistant Researcher, University of California, Los Angeles	08/2012–present
	<i>Dynamical/statistical downscaling and regional climate change</i> ; Sponsored by Professor Alex Hall	
	Developed a novel hybrid high-resolution (3-km) dynamical-statistical downscaling technique to examine hydroclimate variabilities in California and produce end-of-century climate change projections under various greenhouse gas emissions scenarios.	
	Explored the Sierra Nevada precipitation extremes, orographic rain shadow effect and their responses to a changing climate.	
	Investigated regional climate change impacts in California through collaborations across disciplines and government agencies.	
	Implemented a high-resolution regional Earth system modeling framework by coupling atmospheric and oceanic models to investigate coupled coastal climate processes and changes.	
	Postdoctoral Researcher, University of California, Los Angeles	08/2008–07/2012
	<i>Regional climate dynamics and modeling</i> ;	Advised by Professor Alex Hall
	Designed and implemented ultrahigh-resolution (2-km) regional climate modeling framework by integrating dynamical downscaling and statistical downscaling to quantify future climate change over the Great Los Angeles Area.	
	Reconstructed historical climate in the Los Angeles region by dynamically downscaling re-analysis data and global climate models to neighborhood scales using the Weather Research and Forecasting (WRF) Model.	
	Collaborated with wildfire ecologists to project changes to wildfire intensity and frequency in the Southern California mountains.	
	Implemented multi-ensemble short-term sensitivity simulations to optimize WRF’s subgrid-scale parameterization schemes (e.g., microphysics, planetary boundary layer, cumulus).	
	Developed regional sensitivity experiments to investigate variabilities of low stratocumulus clouds and the boundary layer thermodynamical structures over the Tropical East Pacific.	

Tropical climate dynamics and ocean-atmosphere interactions; Advised by
Professor Jin-Yi Yu

Designed climate sensitivity experiments with Community Climate System Model (CCSM) to provide a novel perspective in understanding simulation bias in global climate models.

Explored the tropical climate dynamics with a focus on decadal modulation of El Niño-Southern Oscillation (ENSO) using multiple observational, satellite and reanalysis data.

Developed Regional Ocean Modeling System (ROMS) experiments to investigate the roles of weather extremes, e.g., strong gap winds in regulating ocean surface temperatures.

PEER-REVIEWED
PUBLICATIONS

Sun F., A. Hall, M. Schwartz, D. Walton, and N. Berg, 2016: Twenty-first-century snowfall and snowpack changes over the Southern California mountains. *J. Climate*, **29**, 91–110, doi:10.1175/JCLI-D-15-0199.1.

Walton D., A. Hall, **F. Sun**, M. Schwartz, and N. Berg, 2016: Downscaled CMIP5 projections of elevation dependent warming and snow cover loss in California’s Sierra Nevada. *J. Climate*, in review.

Schwartz M., A. Hall, and **F. Sun**, 2015: Mean surface runoff insensitive to warming in a key Mediterranean-type climate: A case study of the Los Angeles Region. *J. Climate*, in review.

Jin Y., M. Goulden, N. Faivre, S. Veraverbeke, **F. Sun**, A. Hall, M. Hand, S. Hook and J. Randerson, 2015: Identification of two distinct fire regimes in Southern California: Implications for economic impact and future change. *Environ. Res. Lett.*, 10: 094005, doi: 10.1088/1748-9326/10/9/094005.

Sun F., D. Walton, and A. Hall, 2015: A hybrid dynamical-statistical downscaling technique, part II: End-of-century warming projections predict a new climate state in the Los Angeles Region. *J. Climate*, **28**, 4618–4636, doi: 10.1175/JCLI-D-14-00197.1.

Walton D., **F. Sun**, A. Hall and S. Capps, 2015: A hybrid dynamical-statistical downscaling technique, part I: Development and validation of the technique. *J. Climate*, **28**, 4597–4617, doi:10.1175/JCLI-D-14-00196.1.

Jousse A., A. Hall, **F. Sun** and T. Teixeira, 2015: Causes of energy fluxes biases in a stratocumulus region. *Clim. Dynam.*, doi: 10.1007/s00382-015-2599-9.

Berg N., A. Hall, **F. Sun**, S. Capps, D. Walton, B. Langenbrunner and D. Neelin, 2015: Twenty-first-century precipitation changes over the Los Angeles Region, *J. Climate*, **28**, 401–420, doi: 10.1175/JCLI-D-14-00316.1.

Berg N., A. Hall, **F. Sun**, S. Capps, D. Walton, B. Langenbrunner and D. Neelin, 2014: 21st-century precipitation changes over the Los Angeles region: Part III of the “Climate Change in the Los Angeles Region” project. *Los Angeles Regional Collaborative for Climate Action and Sustainability Report III*.

Sun F., A. Hall, D. Walton, S. Capps and K. Reich, 2013: Mid- and end-of-century snowfall in the Los Angeles region: Part II of the “Climate Change in the Los Angeles Region” project. *Los Angeles Regional Collaborative for Climate Action and Sustainability Report II*.

Toniazzo T., **F. Sun**, C. R. Mechoso and A. Hall, 2013: A regional modeling study of the diurnal cycle in the lower troposphere in the south-eastern tropical Pacific. *Clim. Dynam.*, **41**, 1899–1922, doi: 10.1007/s00382-012-1598-3.

Hall A., **F. Sun**, D. Walton, S. Capps, X. Qu, H.-Y. Huang, N. Berg, M. Schwartz, A. Jousse, R. Cerezo-Mota and M. Nakamura, 2012: Mid-century warming in the Los Angeles region: Part I of the “Climate Change in the Los Angeles Region” project. *Los Angeles Regional Collaborative for Climate Action and Sustainability Report I*.

Sun, F., A. Hall, and X. Qu, 2011: On the relationship between low cloud variability and lower tropospheric stability in the Southeast Pacific. *Atmos. Chem. Phys.*, **11**, 9053-9065, doi:10.5194/acp-11-9053-2011.

Wyant, M. C., Wood, R., Bretherton, C. S., Mechoso, C. R., Bacmeister, J., Balmaseda, M. A., Barrett, B., Codron, F., Earnshaw, P., Fast, J., Hannay, C., Kaiser, J. W., Kitagawa, H., Klein, S. A., Köhler, M., Manganello, J., Pan, H.-L., **F. Sun**, Wang, S., and Wang, Y., 2010: The PreVOCA experiment: modeling the lower troposphere in the Southeast Pacific. *Atmos. Chem. Phys.*, **10**, 4757–4774, doi:10.5194/acp-10-4757-2010.

Sun F., and J.-Y. Yu, 2009: A 10–15year modulation cycle of ENSO intensity. *J. Climate*, **22**, 1718–1735, doi: 10.1175/2008JCLI2285.1.

Yu J.-Y., **F. Sun** and H.-Y. Kao, 2009: Contributions of Indian Ocean and monsoon biases to the excessive biennial ENSO in CCSM3. *J. Climate*, **22**, 1850–1858, doi: 10.1175/2008JCLI2706.1.

Sun, F., and J.-Y. Yu, 2006: Impacts of Central America gap winds on the SST annual cycle in the eastern Pacific warm pool. *Geophys. Res. Lett.*, **33**, L06710, doi:10.1029/2005GL024700.

MANUSCRIPTS IN PREPARATION

Sun F., A. Hall, M. Schwartz, N. Berg, and D. Walton, 2016: Inevitable end-of-century loss of spring snowpack over California’s Sierra Nevada, *to be submitted*.

Sun F., A. Hall, N. Berg, D. Walton, and M. Schwartz, 2016: Projected weakening of orographic rain shadows related to precipitation extremes changes: A case study of the Sierra Nevada, *in preparation*.

Schwartz, M., A. Hall, **F. Sun**, D. Walton, and N. Berg, 2016: Significant end-of-21st-century warming-driven advances in surface runoff timing in California’s Sierra Nevada, *to be submitted*.

Schwartz, M., A. Hall, **F. Sun**, N. Berg, and D. Walton, 2016: Projected soil moisture declines in the California Sierra Nevada, *in preparation*.

OTHER PUBLICATIONS

Sun F., 2008: ENSO decadal modulation and tropical Pacific mean climate. *University of California, Irvine Archives*, Ph.D. dissertation.

PATENTS

2km-resolution Climate Data for the Los Angeles Region. *University of California Patent No. 2012-389*

Hall A., **F. Sun**, and S. Capps, University of California, Los Angeles 12/2011

ANALYTICAL & PROGRAMMING SKILLS

Sharp proficiency in data analysis and statistics in weather/climate science research:

Probability distribution/Sampling theory, Time series Analysis (Autocorrelation, Harmonic, Power spectrum, Correlation, Wavelets, Filtering), Principle component/EOF analyses, Regression, Significance tests

Substantial modeling expertise in numerical weather/atmospheric, land and oceanic climate models:

Weather Research and Forecasting Model (WRF), Community Atmosphere Model (CAM), Community Climate System Model (CCSM), Noah land surface model, Regional Ocean Modeling System (ROMS)

Skilled in programming languages:

MATLAB, UNIX/LINUX shell scripting, Python, FORTRAN, L^AT_EX, HTML

Working knowledge in:

R, IDL, Perl, NCL, GrADS

PROFESSIONAL
SERVICE

Manuscript Reviewer for *Journal of Climate*, *Climate Dynamics*, *Journal of Atmospheric Sciences*, *Journal of Hydrometeorology*, *Journal of Geophysical Research*, *Journal of Applied Meteorology and Climatology*, *Climatic Change*, *Urban Meteorology*, *Advances in Geosciences*.

Judge for Outstanding Student Paper Awards in the 2012 and 2013 American Geophysics Union Annual Fall Meetings

SELECTED
CONFERENCE
ABSTRACTS AND
PROCEEDINGS

Sun, F., A. Hall, N. E. Berg, D. B. Walton, and M. Schwartz, 2016: Inevitable End-of-century Loss of Spring Snowpack over California's Sierra Nevada, *28th Conference on Climate Variability and Change in 96th American Meteorological Society Annual Meeting* Abstract 1.4, January 11-14 (Invited "Hot Topics in Climate" Talk)

Sun, F., D. Walton, A. Hall, N. Berg and M. Schwartz, 2014: Snowpack Changes in the Sierra Nevada: High-Resolution Projections for the End of 21st Century, *Eos Trans. AGU*, 95(52), Fall Meet. Suppl., Abstract A51H-3140, December 15-19 (Poster)

Sun, F., A. Hall, D. Walton, S. Capps, and K. Reich, 2013: Projecting Mid- and End-of-Century Climate Change in the Los Angeles Mountainous Region by a Combination of Dynamical and Statistical Downscaling Techniques, *Eos Trans. AGU*, 94(52), Fall Meet. Suppl., Abstract A11A-0009, December 09-13 (Poster)

Sun, F., 2013: Downscaling Hydro-Climate Change in the Los Angeles Region and the Sierra Nevada, *Mountain Research Initiative Key Contact Workshop: Global Change Research in Mountain Regions*, Berkeley, December 08 (Invited Talk)

Sun, F. and A. Hall, 2013: Mid-Century Snowfall Projections in the Los Angeles Mountain Region, *Los Angeles Department of Water and Power Board Meeting*, Los Angeles, California, February 19 (Invited Talk)

Sun, F., A. Hall, D. Walton, S. Capps, X. Qu, H.-Y. Huang, N. Berg, A. Jousse, M. Schwartz, M. Nakamura and R. Cerezo-Mota, 2012: Mid-Century Warming in the Los Angeles Region and its Uncertainty using Dynamical and Statistical Downscaling, *Eos Trans. AGU*, 93(52), Fall Meet. Suppl., Abstract A34E-03, December 03-07 (Talk)

Sun, F., T. Toniazzo, C. R. Mechoso and A. Hall, 2010: Regional modeling studies on the diurnal and semidiurnal cycles of boundary layer off the west coast of South America, *Eos Trans. AGU*, 91(52), Fall Meet. Suppl., Abstract A51A-0051, December 13-17 (Poster)

Sun, F. 2010: Regional climate simulations over the Southeast Pacific, *Chinese Academy of Meteorological Sciences*, Beijing, China, November 11 (Invited Talk)

Sun, F., and A. Hall, 2010: Regional modeling simulations for meteorological conditions for the Santiago wildfire in 2007, *Wildfire in Southern California*, Los Angeles, California, October 21 (Talk)

Sun, F., and A. Hall, 2010: Climate change and predictions in Southern California, *Climate Change and Urban Forests in Los Angeles*, Los Angeles, California, October 15 (Invited Talk)

Sun, F., X. Qu and A. Hall, 2009: An evaluation of LTS as a predictor of low cloud variability, *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract A13J-0441, December 14-18 (Poster)

Sun, F., 2008: ENSO modulation and its links to decadal climate variability in tropical Pacific, *University of California, Los Angeles*, Los Angeles, California, April (Talk)

Sun, F., 2008: A 10–15 year modulation Cycle of ENSO Intensity and its ENSO Asymmetry - Basic State Interaction Mechanism, *U.S. CLIVAR Science Symposium*, Irvine, California, July 14 (Poster)

Sun, F., and J.-Y. Yu, 2007: A 10–15year modulation cycle of ENSO intensity and its ENSO asymmetry-basic state interaction mechanism, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract OS13A-1011, December 10-14 (Poster)

Sun, F., and J.-Y. Yu, 2006: A decadal modulation cycle of ENSO intensity, *Bjerknes Centre for Climate Research Workshop*, Bergen, Norway, September 19-22 (Talk)

Sun, F., and J.-Y. Yu, 2006: Modeling studies on the Central America gap wind forcing to the eastern Pacific warm pool SST annual cycle, *Multidecadal Climate Variability and Teleconnection Dynamics Bjerknes Summer School*, Finse, Norway, September 10-18 (Talk)

Sun, F., and J.-Y. Yu, 2005: Impacts of Central America gap winds on the SST annual cycle in the eastern Pacific warm pool, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract A53B-05, December 05-09 (Talk)

COMPUTING
RESOURCE
ALLOCATIONS
AWARDED

National Energy Research Scientific Computing Center (NERSC)

Hopper (Cray XE6)

Franklin (Cray XT4)

National Science Foundation (NSF) TeraGrid & Extreme Science and Engineering Discovery Environment (XSEDE)

Pople (SGI Altix)

Pittsburgh Supercomputing Center (PSC)

Blacklight (SGI Altix UV-1000)

Pittsburgh Supercomputing Center (PSC)

Cobalt (SGI Altix)

National Center for Supercomputing Applications (NCSA)

Ember (SGI Altix UV-1000)

National Center for Supercomputing Applications (NCSA)

National Center for Atmospheric Research (NCAR)

Bluefire (IBM)

University of California Los Angeles (UCLA)

Hoffman2 (Cluster)

University of California Irvine (UCI)

Earth System Modeling Framework (IBM)

TEACHING
EXPERIENCE

Guest Lecturer, University of California, Irvine

Earth System Science 5: Chapter: Precipitation Processes

05/2007

Earth System Science 210B: Geoscience Data Analysis

11/2005

Teaching Assistant, University of California, Irvine

Earth System Science 5: The Atmosphere	04-06/2007
Earth System Science 3: Oceanography	01-03/2007
Earth System Science 1: The Physical Environment	09-12/2006

HONORS AND AWARDS

Outstanding Teaching Assistant Award, University of California, Irvine	2007
Climate Variability and Change Scholarship, American Meteorological Society	2007
Student Travel Grant, University of California, Irvine	2007
Outstanding Contributions to the Department of Earth System Science, University of California, Irvine	2006-2007
Bjerknes Scholarship, Bjerknes Centre for Climate Research, University of Bergen	2006
Student Travel Grant, School of Physical Sciences, University of California, Irvine	2005
IGPP fellowship, University of California, Irvine	2003-2004
May 4th Medal for Outstanding Youth (top 10 of 20000), Nanjing University	1999
Guanghua Scholarship, Guanghua Education Foundation	1998
People's Academic Prize for Academic Excellence, Nanjing University	1997-1999

PROFESSIONAL MEMBERSHIPS

American Geophysics Union	2005-present
American Meteorological Society	2005-present

SELECTED MEDIA REPORTS AND APPEARANCES

Los Angeles Times: Number of days with temperatures above 95°F to soar in L.A. County
Reuters: Los Angeles can expect number of extreme heat days to rise
The New York Times: "District by District, Climate Change in Los Angeles"
Los Angeles Times: "Climate change could slash snowfall in Southern California mountains"
ScienceDaily: "Dramatic Loss in Snowfall for Los Angeles-Area Mountains Predicted"
Phys.org: "UCLA climate study predicts dramatic loss in local snowfall"
Los Angeles Times: "Study predicts more hot spells in Southern California"
TIME: "Why Dwindling Snow—Thanks Largely to Climate Change—Might Dry Out Los Angeles"
Associated Press: "Study: Southern Calif. could see record scorchers"
NPR/PBS/KQED: "Zooming in on L.A.'s Warming Climate"
Science Newsline Nature Earth: "Mercury rising: Greater L.A. to heat up an average 4 to 5 degrees by mid-century"