

M I M I H U G H E S

mimi.hughes@noaa.gov

NOAA ESRL, Water Cycle Branch, PSD,

325 Broadway, Boulder, CO 80305

Phone: (303) 497-4865

EDUCATION

Ph.D. Atmospheric and Ocean Sciences, University of California, Los Angeles, CA, Spring 2008. Dissertation: Mesoscale dynamics of Southern California's climate.

Advisor: Alex Hall

M.S. Atmospheric and Oceanic Sciences, University of California, Los Angeles, CA, 2004

B.S. Electrical Engineering (Magna cum laude) and Mathematics (Cum laude), Pennsylvania State University, University Park, PA, 2002

PROFESSIONAL EXPERIENCE

Oct. 2010-pres. CIRES, University of Colorado, Boulder, CO

Research Scientist I

Orographic precipitation processes in mid-latitudes: I research atmospheric rivers and orographic precipitation using both a regional reanalysis downscaling and observations. I focus on understanding what controls the distribution of orographic precipitation when wintertime cyclones (often containing atmospheric rivers) impinge on California's topography, and the connections between these features of regional climate and the global climate system.

Arctic science: I am involved in the testing of the recently developed Regional Arctic System Model, and will add data assimilation capabilities to the atmospheric component of that model with the hopes that the addition will improve sea-ice forecasts. I also am using the Weather, Research, and Forecast (WRF) model to downscale the ERA-Interim reanalysis to 10-km horizontal resolution for a climatological investigation of low-level jets in the Arctic.

Oct. 2008-Sept. 2010 NOAA ESRL PSD Water Cycle Branch Boulder, CO

Postdoctoral Research Associate

Generated a 10-year, 6km downscaling of California with WRF. Validated this downscaling against wind-profiler data and sounding data to assess its applicability for investigations of dynamics of the Sierra Barrier Jet. Investigated low-frequency variability and trends of Santa Ana winds in observations over the past half century. Generated meteorological data for ARkStorm.

2002-Sept. 2008 Climate Sensitivity Research Lounge Los Angeles, CA

Research Assistant

Researched mesoscale climate dynamics of Southern California using a high-resolution (6km) climate reconstruction created with MM5. I focused on three aspects of the climate that are unresolvable by traditional climate models: the diurnal cycle of surface air temperature and wind, the interaction of topography with precipitation, and the dynamical causes of the Santa Ana winds.

2000–2002 Atmospheric Sensing and Lidar Lab University Park, PA
Undergraduate Research Assistant

Designed and built the receiver for a Rayleigh Lidar, focusing on the integration of optical choppers into the system. Advisor: Dr. Tim Kane

1999–2000 Applied Research Laboratory University Park, PA
Co-operative Education Student

Implemented and tested a nonlinear algorithm for adaptive filtering. Tested its robustness compared to both signal/noise ratio and number of input signals.

TEACHING EXPERIENCE

2005 UCLA Dept. of Atmos. and Ocean. Sci. Los Angeles, CA

Teaching Assistant: AOS 1 – Climate Change: from puzzles to policy

1999 Learning Resource Center University Park, PA

Supplemental Instruction Leader – Introduction to Statistics

PUBLICATIONS

Hughes M, Neiman PJ, Sukovich E, and Ralph FM (2012) Representation of the Sierra Barrier Jet in 11 years of a high-resolution dynamical reanalysis downscaling compared with long-term wind profiler observations, in preparation for *JGR-Atmospheres*.

Hughes M, Hall A, and Kim, J (2011) Human-induced changes in wind, temperature and relative humidity during Santa Ana events. *Clim. Change*. 109 (S1), 119-132.

Hughes M and Hall A (2010) Local and synoptic mechanisms causing Southern California's Santa Ana winds, *Clim. Dyn.* 34:847-857 DOI: 10.1007/s00382-009-0650-4.

Hughes M, Hall A, and Kim, J (2009) Anthropogenic Reduction of Santa Ana winds, California Environmental Protection Agency and California Energy Commission Report CEC-500-2009-030-F.

Hughes M, Hall A, Fovell, RG (2009) Blocking in areas of complex topography and its influence on rainfall distribution, *J. Atmos. Sci.*, 66:508-518, DOI: 10.1175/2008JAS2689.1.

Hughes M, Hall A, Fovell RG (2007) Dynamical controls on the diurnal cycle of temperature in complex topography. *Clim. Dyn.* 29:277–292.

Dettinger MD, Ralph FM, **Hughes M**, Das T, Neiman P, Cox D, Estes G, Reynolds D, Hartman R, Cayan D, Jones L (2012) Design and quantification of an extreme winter storm scenario for emergency preparedness and planning exercises in California. *Natural Hazards*.

- Dong C, McWilliams J, Hall A, **Hughes M** (2011) Numerical Simulation of a Synoptic Event in the Southern California Bight, *J. Geophys. Res.*, 116, C05018, doi:10.1029/2010JC006578.
- Neiman PJ, Schick LJ, Ralph FM, **Hughes M**, Wick GA (2011) Flooding in Western Washington: The connection to atmospheric rivers. *J. of Hydrometeorology*. 12:6, 1337-1358
- Capps S, Hall A, **Hughes M** (2011) Sensitivity of Southern California Wind Power to Turbine Characteristics. *Submitted to Wind Energy*.
- Porter, K., A. Wein,...**M. Hughes**,...P. J. Neiman,...F. M. Ralph, et al., 2011: Overview of the ArkStorm Scenario, U.S. Geological Survey Open-File Report, 2010-1312, 183 p. and appendixes.
- Moritz MA, Moody TJ, Krawchuk MA, **Hughes M**, and Hall A (2010), Spatial variation in extreme winds predicts large wildfire locations in chaparral ecosystems, *Geophys. Res. Lett.*, 37, L04801, doi:10.1029/2009GL041735.
- Neiman PJ, Sukovich EM, Ralph FM, **Hughes M** (2010) A Seven-Year Wind Profiler-Based Climatology of the Windward Barrier Jet along California's Northern Sierra Nevada. *Mon. Wea. Rev.*, 138, 1206-1233.

CONFERENCE PRESENTATIONS AND SEMINARS

- Hughes, M, Sukovich E, Neiman P, and FM Ralph, Representation of the Sierra Barrier Jet in 11 years of a high-resolution dynamical reanalysis downscaling, American Geophysical Union annual meeting, San Francisco, CA, Dec. 2011
- Hughes, M, Cayan D, and Hall A, Low-frequency variability of and impact of climate change on Southern California's Santa Ana winds, WCRP Climate Research in Service to Society, Denver, CO, Oct. 2011
- Hughes, M, Hall, A, and Kim, J, Local and synoptic mechanisms controlling Southern California's Santa Ana winds, and implications in a changing climate. Scripps Institution of Oceanography, Climate Atmospheric Science and Physical Oceanography, April 2011
- Hughes, M, Hall, A, and Kim, J, Local and synoptic mechanisms controlling Southern California's Santa Ana winds, and implications in a changing climate. NOAA ESRL Physical Sciences Division seminar, Boulder, CO, March 2011
- Hughes, M, Sukovich E, Neiman P, Sierra Barrier Jets that occur simultaneously with atmospheric river events in a high resolution dynamical downscaling of the North American Regional Reanalysis, American Geophysical Union annual meeting, San Francisco, CA, Dec. 2010
- Hughes, M, Sukovich E, Neiman P, and Ralph FM, North-south variability of the Sierra Barrier Jet, and its downscaling representation. CalWater Annual meeting, La Jolla, CA, October 2010.

- Hughes, M, Cayan D, Hall A, Kim J, Ralph FM, Human-induced changes in wind, temperature, and relative humidity during Santa Ana wind events. Boulder Laboratories Postdoctoral Poster Symposium, Boulder, CO, June 2010.
- Hughes, M, Hall, A, and Kim, J, Anthropogenic Reduction of Santa Ana winds, American Geophysical Union annual meeting, San Francisco, CA, Dec. 2008
- Hughes, M, Hall, A, and Kim, J, Anthropogenic Reduction of Santa Ana winds, Fifth Annual Climate Change Research Conference, Sacramento, CA, Sept. 2008
- Hughes, M, Mesoscale dynamics of Southern California's climate, National Weather Service, Oxnard office, Oxnard, CA June 2008
- Hughes, M, Hall, A, and Fovell, RG, On the distribution of rainfall in complex topography, 12th AMS Conference on Mesoscale Processes, Waterville Valley, NH, August 2007
- Hughes, M, Hall, A, and Fovell, RG, Blocking in areas of complex topography, and its influence on rainfall distribution, Mesoscale and Microscale Meteorology division of the National Center for Atmospheric Research, Boulder, CO, June 2007
- Hughes, M, Hall, A, and Fovell, RG, Links between diurnal cycles of temperature and wind in complex topography, 22nd Pacific Climate (PACLIM) Workshop, Pacific Grove, CA, March 2006
- Hughes, M, and Hall, A, The origins of Southern California's climate diversity, 85th Annual AMS general meeting, San Diego, CA, January 2005
- Hughes, M, and Hall, A, Small scale variations in the diurnal amplitude of surface air temperature in Southern California, AGU Fall meeting, San Francisco, CA, 2004

FELLOWSHIPS AND AWARDS

- National Research Council Postdoctoral Research Associateship, 2008-2010
- Bjerknes Memorial Award "for research involving the understanding of climate dynamics at the regional scale", Dept of Atmos. & Ocean. Sci., UCLA, Fall 2007.
- Dissertation year fellowship, UCLA, 2007-2008
- Regents stipend, UCLA, 2006-2007
- Brian Lance Bosart Award, "for unselfish service to fellow students and positive contribution to department life while demonstrating a firm commitment to academics". Department of Atmospheric and Oceanic Sciences, UCLA, Fall 2005.
- National Science Foundation Graduate Research Fellowship, 2003-2006
- Eugene V. Cota-Robles Fellowship, UCLA, 2002-2003
- IGPP UCLA Fellowship, 2002-2003
- McNair Scholar, 2001-2002
- Schreyer Honor's College scholarship, 1997-2001

PROFESSIONAL SERVICES

Reviewer: Journal of Applied Meteorology and Climatology, Geophysical Research Letters,
International Journal of Biometeorology, Journal of the Atmospheric Sciences
Member of the Workplace Advisory Committee in NOAA ESRL's Physical Sciences
Division
UCLA Chi Epsilon Pi -- Faculty Representative, 2003-2007
AMS/AGU Member since 2002