

# CURRICULUM VITAE

## ALEXANDER GERSHUNOV

Climate, Atmospheric Science and Physical Oceanography (CASPO) Division  
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### RESEARCH INTERESTS

Weather and climate extremes; global and regional weather and climate variability on hourly to multi-century time scales; water cycle, hydro-meteorology and hydro-climate; coupled ocean-land-atmosphere dynamics; teleconnections; long-range seasonal predictability and prediction of daily weather statistics; meteorological and climate model validation, downscaling and statistical correction; applications of climate forecasts; extreme precipitation, atmospheric rivers and drought; climate and wildfire; fire weather; coastal low clouds; heat waves and cold snaps; climate impacts on public health, water resources, energy and agriculture; climatic history and future change; climate-society interactions

### EDUCATION

**Ph.D.** (1996) University of California, Santa Barbara (UCSB), Geography Department (Climatology)

**M. S.** (1989) UCSB, Statistics and Applied Probability Department

**B. S.** (1986) University of California, Irvine, Math Department

### RESEARCH EXPERIENCE

**Research Meteorologist.** 2013 – Present. CASPO, Scripps Institution of Oceanography (SIO)

**Associate Research Meteorologist.** 2007 – 2013. CASPO, SIO.

**Associate Project Scientist.** 2006 – 2007. Climate Research Division, SIO.

**Assistant Project Scientist.** 2000 – 2006. Climate Research Division, SIO.

**Visiting Researcher.** June - August 2004. Centre National de Recherches Météorologiques (CNRM), Meteo-France.

**Visiting Researcher.** October 2002 – January 2003 and December 2001 – March 2002. Laboratoire de Météorologie Dynamique (LMD) du SNRS, Paliseau, France.

**Postgraduate Research Meteorologist.** 1996 – 2000. Climate Research Division, SIO.

**NASA Global Change Research Fellow.** 1992 – 1995. Geography Department, UCSB.

### TEACHING EXPERIENCE

**Lecturer (Senior) in Climate Sciences.**

- 2011 (2013) – Present. SIO/UCSD. Directing graduate and undergraduate research
- Winters 2015, 2016. Subject: *The Atmosphere (SIO20)*. Undergraduate meteorology course

**Visiting Professor.** March – June 2006. Departamento de Física, Universidad de Alcalá de Henares, Spain. Subject: *Climate variability, change and prediction*. Graduate and undergraduate course

**Rotary Foundation University Teacher** at the Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE). Spring 2004. Subject: *Climatic variability and predictability*. Graduate seminar

**Lecturer in the Geography Department, UCSB:**

- Fall 1995. Subject: *Climatic Change*. Upper division undergraduate course
- Spring 1996. Subject: *Tropical Meteorology*. Upper division undergraduate course

### MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- American Meteorological Society • American Geophysical Union • International Association of Hydrological Sciences
- U.S. CLIVAR Executive Committee • VAMOS Working Group On Extremes

### AWARDS

- NASA Global Change Research Fellow, 1992–1995
- Korein Foundation Research Grants, 2003, 2004, 2005, 2006, 2007
- Rotary Foundation International Teaching Grant, 2004

## LANGUAGES

- English (fluent) • Russian (native) • French (fluent) • Spanish (workable)

## PUBLICATIONS, SEMINARS AND PRESENTATIONS AT PROFESSIONAL MEETINGS

Complete list of publications contains over 70 papers. Over 200 presentations, lectures and invited seminars.

## REFEREED PUBLICATIONS

- Polade, S.D., A. Gershunov, D. Cayan, M.D. Dettinger and D.W. Pierce, 2017: Precipitation in a warming world: Assessing projected hydro-climate of California and other Mediterranean climate regions. *Nature Scientific Reports*, in review.
- Guirguis, K., A. Gershunov, D.R. Cayan and D. Pierce, 2017: Heat wave probability in the changing climate of the Southwest US. *Climate Dynamics*, in review.
- Barlow, M., W.J. Gutowski Jr., J.R. Gyakum, R.W. Katz, Y.-K. Lim, R.S. Schumacher, M.F. Wehner, M. Bosilovich, A. Gershunov, R. Grotjahn, R. Leung, S. Milrad, L. Agel, 2017: North American extreme precipitation events and related large scale meteorological patterns: a review of statistical methods, dynamics, modeling, and trends. *Climate Dynamics*, in review.
- Gershunov A., T.M. Shulgina, F.M. Ralph, D. Lavers and J.J. Rutz, 2017: Assessing climate-scale behavior of Atmospheric Rivers affecting western North America. *Geophysical Research Letters*, in review.
- Clemesha, R.E., A.Gershunov, S.F. Iacobellis and D.R. Cayan, 2017: On the relationship between daily coastal low cloud variability and lower tropospheric stability along the North American West Coast. *GRL*, in review.
- Guzman Morales, J., A. Gershunov, J. Theiss, H. Li and D. Cayan, 2016: Santa Ana Winds of southern California: their climatology, extremes and behavior since 1948. *Geophysical Research Letters*, 43, doi:[10.1002/2016GL067887](https://doi.org/10.1002/2016GL067887).
- Clemesha, R.E., A. Gershunov, S.F. Iacobellis, D.R. Cayan and A.P. Williams, 2016: The Northward March of Summer Low Cloudiness along the California Coast. *Geophysical Research Letters*, 43, doi:[10.1002/2015GL067081](https://doi.org/10.1002/2015GL067081).
- Grotjahn R., R. Black, R. Leung, M.F. Wehner, M. Barlow, M. Bosilovich, A. Gershunov, W.J. Gutowski Jr., J.R. Gyakum, R.W. Katz, Y.-Y. Lee, Y.-K. Lim, Prabhat, 2016: North American Extreme Temperature Events and Related Large Scale Meteorological Patterns: A Review of Statistical Methods, Dynamics, Modeling, and Trends. *Climate Dynamics*, 46, 1151-1184, doi: [10.1007/s00382-015-2638-6](https://doi.org/10.1007/s00382-015-2638-6).
- Guirguis, K., A. Gershunov and D. Cayan, 2015: Interannual variability in associations between seasonal climate, weather and extremes: wintertime temperature over the Southwestern United States. *Environmental Research Letters*, 10, 124023, doi:[10.1088/1748-9326/10/12/124023](https://doi.org/10.1088/1748-9326/10/12/124023).
- Lavers, D.A., F.M. Ralph, D.E. Waliser, A. Gershunov and M.D. Dettinger, 2015: Climate change intensification of horizontal water vapor transport in CMIP5. *Geophysical Research Letters*, 42, 5617-5625, doi:[10.1002/2015GL064672](https://doi.org/10.1002/2015GL064672).
- Cavanaugh, N.R., A. Gershunov, 2015: Probabilistic Tail Dependence of Intense Precipitation on Spatiotemporal Scale in Observations, Reanalyses, and GCMs. *Climate Dynamics*, 45, 2965-2975, DOI:[10.1007/s00382-015-2517-1](https://doi.org/10.1007/s00382-015-2517-1).
- Cavanaugh, N.R., A. Gershunov, A.K. Panorska, and T.J. Kozubowski, 2015: The Probability Distribution of Intense Daily Precipitation. *Geophysical Research Letters*, 42, 1560–1567. doi: [10.1002/2015GL063238](https://doi.org/10.1002/2015GL063238).
- Schwartz, R.E., A. Gershunov, S.F. Iacobellis and D.R. Cayan, 2014: North American West Coast Summer Low Cloudiness: Broad Scale Variability Associated with Sea Surface Temperature. *Geophysical Research Letters*. 41, 3307–3314, DOI: [10.1002/2014GL059825](https://doi.org/10.1002/2014GL059825).
- Polade, S.D., D.W. Pierce, D.R. Cayan, A. Gershunov and M.D. Dettinger, 2014: The key role of dry days in changing regional climate and precipitation regimes. *Nature Scientific Reports* 4, 4364; DOI:[10.1038/srep04364](https://doi.org/10.1038/srep04364).
- Guirguis, K., A. Gershunov, A. Tardy and R. Basu, 2014: The Impact of Recent Heat Waves on Human Health in California. *Journal of Applied Meteorology and Climatology*, 53, 3-19.
- Brown, H. E., A. C. Comrie, D. M. Drechsler, C. M. Barker, R. Basu, T. Brown, A. Gershunov, A. M. Kilpatrick, W. K. Reisen, and D. M. Ruddell. 2013. "Human Health." Chapter 15 in *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black, and S. LeRoy, 312–339. A report by the Southwest Climate Alliance. NCA Regional Input Reports. Washington, DC: Island Press. ISBN 9781610914468
- Gershunov, A., B. Rajagopalan, J. Overpeck, K. Guirguis, D. Cayan, M. Hughes, M. Dettinger, C. Castro, R. E. Schwartz, M. Anderson, A. J. Ray, J. Barsugli, T. Cavazos, and M. Alexander. 2013. "Future Climate: Projected Extremes." Chapter 7 in *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black, and S. LeRoy, 126–147. A report by the Southwest Climate Alliance. NCA Regional Input Reports. Washington, DC: Island Press. ISBN 9781610914468
- Cayan, D., M. Tyree, K. E. Kunkel, C. Castro, A. Gershunov, J. Barsugli, A. J. Ray, J. Overpeck, M. Anderson, J. Russell, B. Rajagopalan, I. Rangwala, and P. Duffy. 2013. "Future Climate: Projected Average." Chapter 6 in *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black, and S. LeRoy, 101–125. A report by the Southwest Climate Alliance. NCA Regional Input Reports. Washington, DC: Island Press. ISBN 9781610914468

- Polade, S.D., A. Gershunov, D.R. Cayan, M.D. Dettinger and D.W. Pierce, 2013: Natural climate variability and teleconnections to precipitation over the Pacific-North American region in CMIP3 and CMIP5 models. *Geophysical Research Letters*, 40, doi:10.1002/grl.50491.
- Rodó X., M. Pascual, F.J. Doblas-Reyes, A. Gershunov, D.A. Stone, F. Giorgi, P.J. Hudson, J. Kinter, M.-À. Rodríguez-Arias, N.Ch. Stenseth, D. Alonso, J. Garcia-Serrano, A.P. Dobson, 2013: Climate Change and Infectious Diseases: Can we meet the needs for better prediction? *Climatic Change*, 118, 625-640.
- Gershunov A. and K. Guirguis, 2012: California heat waves in the present and future. *Geophysical Research Letters*, 39, L18710, doi:10.1029/2012GL052979.
- Semenza, J.C., J.S. Caplan, G. Buescher, T. Das, M.V. Brinks and A. Gershunov, 2012: Climate Change and Health Risk from Swimming at California Beaches. *Emerging Infectious Diseases*, DOI: 10.1007/s10393-012-0779-1.
- Macias D., M.R. Landry, A. Gershunov, A.J. Miller and P.J.S. Franks, 2012: Climatic Control of Upwelling Variability along the Western North-American Coast. *PLoS ONE*, 7, 1-13.
- Gershunov, A, Z. Johnston, H.G. Margolis and K. Guirguis, 2011: The California Heat Wave 2006 with Impacts on Statewide Medical Emergency: A space-time analysis. *Geography Research Forum*, 31, 6-31.
- Guirguis, K., A. Gershunov, R. Schwartz and S. Bennett, 2011: Recent warm and cold daily winter temperature extremes in the Northern Hemisphere, *Geophysical Research Letters*, 38, L17701, doi:10.1029/2011GL048762.
- Cayan, D.R., T. Das, D.W. Pierce, T.P. Barnett, M. Tyree and A Gershunov, 2010: Future dryness in the southwest US and the hydrology of the early 21st century drought. *PNAS*, 107, 21271-21276, doi:10.1073/pnas.0912391107.
- Gershunov A., D. Cayan and B. Retournaz, 2010: California Heat Waves with Impacts on Wine Grapes. In E.G. Pavia, J. Sheinbaum and J. Candela (Eds), *The Ocean, the Wine, and the Valley: The Lives of Antoine Badan*, Lulu Press, 205-223, ISBN 978-0-557-94026-4.
- OrtizBevia, M., I. Perez-Gonzalez, F. Alvarez-Garcia and A. Gershunov, 2010: Nonlinear estimation of El Niño impact on the North Atlantic winter. *Journal of Geophysical Research*, 115, 10pp, doi:10.1029/2009JD013387.
- Ben Ari, T., A. Gershunov, T. Rouyer, B. Cazelles, K.L. Gage, N.Ch. Stenseth, 2010: Interannual variability of human plague occurrence in the western U.S. explained by tropical and North Pacific Ocean climate variability. *American Journal of Tropical Medicine & Hygiene*, 83, 624-632.
- Gershunov, A., D. Cayan and S. Iacobellis, 2009: The great 2006 heat wave over California and Nevada: Signal of an increasing trend. *Journal of Climate*, 22, 6181-6203.
- Favre, A. and A. Gershunov, 2009: North Pacific cyclonic and anticyclonic transients in a global warming context: possible consequences for Western North American daily precipitation and temperature extremes. *Climate Dynamics*, 32, 969-987.
- Kozubowski, T.J., A.K. Panorska, F. Qeadan, A. Gershunov and D. Rominger, 2009: Testing exponentiality versus Pareto distribution via likelihood ratio. *Communications in Statistics: Simulation and Computation*, 38, 118-139.
- Ben Ari, T., A. Gershunov, T. Rouyer, B. Cazelles, K.L. Gage, N.Ch. Stenseth, 2008: Human plague in the USA: the importance of regional and local climate. *Biology Letters*, 4, 737-740.
- White, W.B., A. Gershunov, J.L. Annis, 2008: Climatic influences on Midwest drought during the 20<sup>th</sup> century. *Journal of Climate*, 21, 517-531.
- Gershunov A. and H. Douville, 2008: Extensive summer hot and cold extremes under current and possible future climatic conditions: Europe and North America. In: H. F. Diaz and R. J. Murnane (Eds.), *Climate Extremes and Society*. Cambridge University Press, New York, 348pp, 74-98.
- Panorska, A.K., A. Gershunov and T.J. Kozubowski, 2007: From diversity to volatility: Probability of daily precipitation extremes. In: A. Tsonis and J. Elsner (Eds.), *Nonlinear Dynamics in Geosciences*, Springer, New York, pp. 465-484.
- Favre, A. and A. Gershunov, 2006: Extra-tropical cyclonic/anticyclonic activity in North-Eastern Pacific and air temperature extremes in Western North America. *Climate Dynamics*, 26, 617-629.
- Alfaro, E., A. Gershunov and D.R. Cayan, 2006: Prediction of summer maximum and minimum temperature over the Central and Western United States: The role of soil moisture and sea surface temperature. *Journal of Climate*. 19, 1407-1421.
- Alfaro, E., D.W. Pierce, A. Steinemann and A. Gershunov, 2005: Relationships Between the Irrigation Pumping Electrical Loads and the Local Climate in Climate Division 9, Idaho. *Journal of Applied Meteorology*. 44, 1972-1978.
- White, W.B., A. Gershunov, J.L. Annis, G. McKeon and J. Syktus, 2004: Forecasting Australian drought using southern hemisphere modes of sea surface temperature variability. *International Journal of Climatology*. 24, 1911-1927.
- Alfaro, E., A. Gershunov, D.R. Cayan, A. Steinemann, D.W. Pierce and T.P. Barnett, 2004: A method for prediction of California summer air surface temperature. *Eos*. 85. 553, 557-558.
- Gershunov, A. and R. Roca, 2004: Coupling of latent heat flux and the greenhouse effect by large-scale tropical/subtropical dynamics diagnosed in a set of observations and model simulations. *Climate Dynamics*, 22, 205-222.
- Gershunov, A. and D. Cayan, 2003: Heavy daily precipitation frequency over the contiguous United States: Sources of climatic variability and seasonal predictability. *Journal of Climate*, 16, 2752-2765.
- Westerling, A.L., A. Gershunov, T. Brown, D. Cayan, and M. Dettinger, 2003: Climate and wildfire in the western United States. *Bulletin of the American Meteorological Society*, 84, 595-604.
- Westerling, A.L., A. Gershunov, D.R. Cayan and T.P. Barnett, 2002: Long lead statistical forecasts of area burned in western U.S. wildfires by ecosystem province. *Int. Journal of Wildland Fire*, 11, 257-266.

- Gershunov, A., N. Schneider and T. Barnett, 2001: Low frequency modulation of the ENSO-Indian monsoon rainfall relationship: Signal or noise. *Journal of Climate*, 14, 2486-2492.
- Biondi, F., A. Gershunov and D. Cayan, 2001: North Pacific decadal climate variability since AD 1661. *Journal of Climate*, 14, 5-10.
- Gershunov, A., T. Barnett, D. Cayan, T. Tubbs and L. Goddard, 2000: Predicting and downscaling ENSO impacts on intraseasonal precipitation statistics in California: the 1997-1998 event. *Journal of Hydrometeorology*, 1, 201-209.
- Gershunov, A., T. Barnett and D. Cayan, 1999: North Pacific interdecadal oscillation seen as factor in ENSO-related North American climate anomalies. *Eos*, 80, 25-30.
- Gershunov, A. and T. Barnett, 1998: Inter-decadal modulation of ENSO teleconnections. *Bulletin of the American Meteorological Society*, 79, 2715-2725.
- Gershunov, A., 1998: ENSO influence on intraseasonal extreme rainfall and temperature frequencies in the contiguous US: Implications for long-range predictability. *Journal of Climate*, 11, 3192-3203.
- Gershunov, A. and T. Barnett, 1998: ENSO influence on intraseasonal extreme rainfall and temperature frequencies in the contiguous US: observations and model results. *Journal of Climate*, 11, 1575-1586.
- Gershunov, A., J. Michaelsen and C. Gautier, 1998: Large-Scale Coupling Between the Tropical Greenhouse Effect and Latent Heat Flux via Atmospheric Dynamics. *Journal of Geophysical Research*, 103, 6017-6031.
- Gershunov, A. and J. Michaelsen, 1996: Climatic-Scale Space-Time Variability of Tropical Precipitation. *Journal of Geophysical Research*, 101, 26297-26307.
- Gershunov, A. and J. Michaelsen, 1996: Vertical Variability of Water Vapor in the Midlatitude Upper Troposphere. *Contributions to Atmospheric Physics*, 69, 205-214.