

## Stuart M. Evans

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University at Buffalo

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### Appointments

#### Assistant Professor

*Department of Geography, RENEW Institute*

SUNY University at Buffalo

*January 2018 – Present*

#### Postdoctoral Research Associate

*Advisors: Elena Shevliakova, Paul Ginoux*

Geophysical Fluid Dynamics Laboratory

*December 2014 – November 2017*

#### Research Assistant

*Advisors: Thomas Ackerman, Roger Marchand*

University of Washington

*September 2007 – August 2014*

#### Post-baccalaureate Research Assistant

*Advisor: Thomas Vestrand*

Los Alamos National Laboratory

*October 2004 – October 2006*

### Education

Ph.D. in Atmospheric Science

University of Washington, Seattle

*August 2014*

B.A. in Astronomy

Haverford College

*May 2003*

### Publications

#### *Submitted*

Aryal, Y., and **S.M. Evans**: Decreasing trends in the western US dust intensity with rareness of heavy dust storms, *J. Geophysical Research - Atmospheres*

#### *Published*

- 2021** Cluett, A. A., E. K. Thomas, **S.M. Evans**, and P. W. Keys: Seasonal variation in moisture origin explain spatial gradients in precipitation isotope seasonality on coastal western Greenland, *J. Geophysical Research - Atmospheres*, doi: 10.1029/2020JD033543.
- 2021** Aryal, Y. and **S.M. Evans**: Global dust variability explained by drought sensitivity in CMIP6 models, *J. Geophysical Research: Earth Surface*, doi: 10.1029/2021JF006073.
- 2020** **Evans, S.M.**, E. Dawson, and P. A. Ginoux: Linear relation between shifting ITCZ and dust hemispheric asymmetry, *Geophysical Research Letters*, 47, doi: 10.1029/2020GL090499
- 2019** **Evans, S.M.**, S. Malyshev, P. A. Ginoux, and E. Shevliakova: The impacts of the dust radiative effect on vegetation growth in the Sahel, *Glob. Biogeochem. Cyc.*, 33, doi: 10.1029/2018GB006128.
- 2017** **Evans, S.M.**, R.T. Marchand, T.P. Ackerman, L.J. Donner, J.-C. Golaz, and C. Seman: Diagnosing cloud biases in the GFDL AM3 model with atmospheric classification, *Journal of Geophysical Research - Atmospheres*, 122, 12,827 – 12,844.
- 2016** **Evans, S.M.**, P.A. Ginoux, S. Malyshev, and E. Shevliakova: Climate – vegetation interaction and amplification of Australian dust variability, *Geophysical Research Letters*, 43, doi: 10.1002/2016GL071016.
- 2014** **Evans, S.M.**, R.T. Marchand, and T.P. Ackerman: Variability of the Australian monsoon and precipitation trends at Darwin, *Journal of Climate*, 27, 8487- 8500.

- 2014** Muhlbauer, A., T.P. Ackerman, J.M. Comstock, G.S. Diskin, **S.M. Evans**, R.P. Lawson, and R.T. Marchand: Impact of large-scale dynamics on the microphysical properties of mid-latitude cirrus. *Journal of Geophysical Research*, 119, 3976-3996.
- 2012** **Evans, S.M.**, R.T. Marchand, T.P. Ackerman, and N. Beagley, Identification and analysis of atmospheric states and associated cloud properties for Darwin, Australia. *Journal of Geophysical Research*. 117. D06204.

*As an astronomer*

- 2006** Vestrand, W.T., J.A. Wren, P.R. Wozniak, R. Aptekar, S. Golentskii, V. Pal'shin, T. Sakamoto, R.R. White, **S.M. Evans**, D. Casperson, and E. Fenimore: Energy input and response from prompt and early optical afterglow emission in gamma-ray bursts. *Nature*. 442, 172-175.
- 2006** Wozniak, P.R., W.T. Vestrand, J.A. Wren, R.R. White, **S.M. Evans**, and D. Casperson: Raptor observations of delayed explosive activity in the high-redshift gamma-ray burst GRB 060206. *Astrophysical Journal*, 642, L99-L102.
- 2006** White, R.R., **S.M. Evans**, W.T. Vestrand, M.S. Warren, J.A. Wren, P.R. Wozniak: Thinking telescopes and the future astronomical meta-network. *Astronomische Nachrichten*, 327, 758-762.
- 2005** Wozniak, P.R., W.T. Vestrand, J.A. Wren, R.R. White, **S.M. Evans**, and D. Casperson: Raptor observations of the early optical afterglow from GRB 050319. *Astrophysical Journal*, 627, L13-L16.
- 2005** Vestrand, W.T., P.R. Wozniak, J.A. Wren, E.E. Fenimore, T. Sakamoto, R.R. White, D. Casperson, H. Davis, **S.M. Evans**, M. Galassi, K.E. McGowan, J.A. Schier, J.W. Asa, S.D. Barthelmy, J.R. Cummings, N. Gehreis, D. Hullinger, H.A. Krimm, C.B. Markwardt, K. McLean, D. Palmer, A. Parsons, and J. Tueller: A link between prompt optical and prompt gamma-ray emission in gamma-ray bursts. *Nature*. 435. 178-180.

## Teaching

### Earth, Environment, and Climate Laboratory

*University at Buffalo, GEO 105*

Weekly labs will cover interdisciplinary environmental topics such as: climate change, earthquakes, fracking, species extinctions, and water resources. Students will use the scientific method to critically evaluate environmental controversies, explore the role of ethics in science, and learn to distinguish science from pseudo-science.

### Global Climate Change

*University at Buffalo, GEO 106*

Examines climate changes of the past, present and future. Considers the various causes of past and present climate change and how to predict future changes. Describes predicted environmental and social impacts of, and possible solutions to, future climate change.

### Climate and Weather

*University at Buffalo, GEO 344*

Examines the physical and chemical processes that determine the climate and weather of the Earth's atmosphere, land surface, and oceans: radiative transfer, energy balance, the hydrologic cycle, atmospheric and oceanic energy transport. Investigates factors controlling climate change, both past and present. Discusses the relationship between climate, weather, and extreme events.

## Fundamentals of Climate Science

*University at Buffalo, GEO 503*

Fundamental physical processes give rise to the observed distributions of temperature, precipitation, wind, ice, vegetation, and ocean currents in Earth's climate system. We examine these processes and their effects on climate, as well as climate sensitivity, natural climate variability on interannual to decadal time scales, and an introduction to the uses of global climate models.

## Atmospheric Science

*University at Buffalo, GEO 503*

A quantitative look at the basic processes that govern our atmosphere, with the goal of providing a broad background in how the atmosphere works, standard analytic techniques used by atmospheric scientists, and an ability to read and understand the scientific literature on the subject. Topics include atmospheric circulation, weather systems, energy transfer, cloud microphysics, atmospheric chemistry, and climate variability.

## Student Mentoring

MS Students Supervised: Elnora Gaiser (GEO)

MS Committees: Allison Leet (GEO), David Ehrenreich (GEO), Hadarou Sare (GLY),  
Joshua Charlton (GLY), Hannah Holtzman (GLY)

PhD Committees: Allison Cluett (GLY), Devon Gorbey (GLY), Maris Grundy (EVS)

## Seminars and Presentations

- 2021** Evans, S.M., Weather pattern variability produces dust variability in the North American Great Plains, Goldschmidt 2021 (oral)  
Aryal, Y., and S.M. Evans, Trends in US dust frequency and intensity: role of climate and local meteorology, Goldschmidt 2021 (oral)
- 2020** Evans, S.M., E. Dawson, and P.A. Ginoux, Hemispheric asymmetry of dust shifts the latitude of tropical precipitation, AGU Fall Meeting (oral)  
Aryal, Y., and S.M. Evans, Dust-drought relationship in CMIP6 simulations, AGU Fall Meeting (oral)  
Soonthornrangsang, J., C. Lowry, S. Evans, and Y. Aryal, Quantifying water availability in a climatically and anthropogenically changing Western New York, AGU Fall Meeting (oral)  
Milleville, R., C. Lowry, S. Evans, and Y. Aryal, Evaluation of the effectiveness of green infrastructure for stormwater management under current and future climates in Buffalo, New York, AGU Fall Meeting (poster)
- 2019** Evans, S.M.: The weather patterns responsible for atmospheric dust in the Great Plains, AGU Fall Meeting, San Francisco, CA (oral)  
Evans, S.M., and K. Poinar: How does playing the Wedge Game affect undergraduates' outlook on solving the climate crisis?, AGU Fall Meeting, San Francisco, CA (poster)  
Ginoux, P.A., S.M. Evans, S. Malyshev, B. Pu, and E. Shevliakova: Analysis of the controlling factors of dust low frequency variability, AGU Fall Meeting, San Francisco, CA (oral)

- Climate Seminar, Department of Atmospheric and Environmental Science, University at Albany: Connecting the land, atmosphere, and vegetation through dust, April 2019
- 2018** Evans, S.M., S. Malyshev, E. Shevliakova, and P.A. Ginoux: Classifying the global dust emitting regions by causes of variability, AGU Fall Meeting, Washington, DC, (oral)
- Cluett, A., S.M. Evans, and E.K. Thomas: Investigating the role of moisture source seasonality in the meridional gradient in precipitation  $^{18}\text{O}$  and  $\text{d}$ -excess seasonality along coastal western Greenland, AGU Fall Meeting, Washington, DC (poster)
- Pegrum Lecture, Department of Geology, University at Buffalo: Windblown dust in the climate system: observations, simulations, and impacts, March 2018
- 2017** Evans, S.M., P.A. Ginoux, S. Malyshev, and E. Shevliakova: The impacts of the dust radiative effect on vegetation growth in the Sahel, AGU Fall Meeting, New Orleans, LA (oral)
- Lamont-Doherty Earth Observatory Geochemistry seminar: Windblown dust in the climate system: observations, simulations, and impacts, April 2017
- Evans, S.M., P.A. Ginoux, S. Malyshev, and E. Shevliakova: Dust amplification of ENSO related rainfall anomalies over Australia in the NOAA/GFDL Coupled Model 3, AMS Annual Meeting, Seattle, WA (poster)
- 2016** Evans, S.M., P.A. Ginoux, S. Malyshev, and E. Shevliakova: Dust amplification of ENSO related rainfall anomalies over Australia in the NOAA/GFDL Coupled Model 3, AGU Fall Meeting, San Francisco, CA (oral)
- GFDL Seminar: Simulating dust variability and its effects on regional climate, November 2016
- 2015** Evans, S.M., P.A. Ginoux, S. Malyshev, and E. Shevliakova: Influence of land surface processes on seasonal and interannual variability of Australian dust and climate in the NOAA/GFDL CM3 model, AGU Fall Meeting, San Francisco, CA (poster)
- Evans, S.M., R. Marchand, T. Ackerman: Diagnosing cloud occurrence biases in the AM3 using atmospheric classification, ASR Science Team Meeting, Tysons Corner, VA (poster)
- Princeton AOS Student/Postdoc Seminar Series, Variability of the Australian monsoon and precipitation trends at Darwin, January 2015
- 2014** Evans, S.M., R. Marchand, T. Ackerman: Diagnosing cloud occurrence biases in the AM3 using atmospheric classification, AGU Fall Meeting, San Francisco, CA (poster)
- UW Atmospheric Sciences Colloquium: Evaluating modeled cloud properties using atmospheric classification, August 2014
- Evans, S.M., R. Marchand, T. Ackerman: Evaluating clouds in the AM3 model using atmospheric classification, ASR Science Team Meeting, Potomac, MD. (poster)
- 2013** Evans, S.M., R. Marchand, T. Ackerman: Evaluating clouds in the AM3 model using atmospheric classification, AGU Fall Meeting, San Francisco, CA. (poster).
- Evans, S.M., R. Marchand, T. Ackerman: Investigating variability in the Australian monsoon and rainfall with cluster analysis, ASR Science Team Meeting, Potomac, MD. (poster)
- UW Graduate Student Climate Seminar: An Introduction to the Australian Monsoon, January 2013
- 2012** Evans, S.M., R. Marchand, T. Ackerman: The influence of ENSO and the MJO on the variability of the Australian monsoon, AGU Fall Meeting, San Francisco, CA. (poster).
- Evans, S.M., R. Marchand, T. Ackerman: Atmospheric classification as a means to study interactions between the Australian monsoon, ENSO, and the MJO, Eatonville, WA. (poster)

- UW Atmospheric Physics and Chemistry Seminar: Atmospheric classification as a model evaluation tool, April 2012
- Evans, S.M., R. Marchand, T. Ackerman: A decadal climatology of atmospheric state at Southern Great Plains, ASR Science Team Meeting, Crystal City, VA. (poster)
- 2011** Evans, S.M., R. Marchand, T. Ackerman: A decadal climatology of atmospheric state at Southern Great Plains, AGU Fall Meeting, San Francisco, CA. (poster).
- Evans, S.M., R. Marchand, T. Ackerman: Use of a cluster analysis to investigate the relationship between large-scale dynamics and clouds, Graduate Climate Conference 2011, Woods Hole, MA. (poster)
- Evans, S.M., R. Marchand, T. Ackerman: Use of a cluster analysis to investigate the relationship between large-scale dynamics and clouds, ASR Science Team Meeting, San Antonio, TX. (poster)
- Evans, S.M., R. Marchand, T. Ackerman: On the relationship between large scale dynamics and clouds: a decadal climatology of cloud properties for the Southern Great Plains, AMS 23rd Conference on Climate Change and Variability, Seattle, WA. (oral)
- 2010** Evans, S.M., R. Marchand, T. Ackerman: Atmospheric Classification at Darwin, Australia, AGU Fall Meeting, San Francisco, CA. (poster)
- Evans, S.M., R. Marchand, T. Ackerman: Atmospheric Classification at Darwin, Australia, UW Program on Climate Change Summer Institute. (poster)
- Evans, S.M.: Connecting cloud properties with large-scale dynamics, 4th Graduate Climate Conference, Eatonville, WA. (oral)
- UW Atmospheric Physics and Chemistry Seminar: Identification and analysis of atmospheric states and related cloud structures for Darwin, Australia.
- Evans, S.M., R. Marchand, T. Ackerman: Atmospheric Classification at Darwin, Australia, ASR Science Team Meeting, Bethesda, MD. (poster)
- 2009** Evans, S.M., R. Marchand, T. Ackerman: Application of an iterative weather classification method to the tropical west Pacific, 3rd Graduate Climate Conference, Eatonville, WA. (poster)

## Professional Activities

- Reviewer:** Proceedings of the National Academy of Sciences, Climate Dynamics, J. Geophysical Research – Atmospheres, Progress in Physical Geography, Aeolian Research, Climate of the Past, Monthly Weather Review, Applied Sciences, Atmosphere, Remote Sensing, Land, Climate, Sustainability
- Convener:** Spatial and Temporal Variability of Dust Emissions and Transport: Importance of High-Latitude Sources and Insights from Paleodust Archives, AGU Fall Meeting (2017, 2020)
- Developer and Administration:** Department of Geography Dr. L. Michael Trapasso Award for Weather and Climate Impacts
- Committees:** Department of Geography Diversity Statement Committee (2019-2020), Abstract Committee Co-chair, 4th Graduate Climate Conference (2009-2010), Executive Committee, 4th Graduate Climate Conference (2009-2010)
- Organizer:** UW Graduate Climate Seminar Coordinator (2011-2012)

## Outreach and Service

- 2021** Guest expert: Washington Post, Associated Press, WGRZ, Spectrum News Buffalo

- 2019** Invited Speaker, Pint of Science Festival, Buffalo  
Guest expert: NYMag
- 2018** Panelist, Panel on Preparing for climate change impacts on supply chain management, Western New York Sustainable Business Roundtable: Projecting the future and potential hazards, UB South Campus, November, 2018
- 2015** GFDL Outreach Volunteer, Ocean Fun Days (2015)
- 2012–13** Graduate Student Representative, The Board of the Program on Climate Change, University of Washington
- 2012** Panelist, UW AMS Student Chapter: The Real Consensus on Climate Change, May 2012
- 2012–13** Distinguished Visiting Speaker Coordinator, Department of Atmospheric Sciences, University of Washington
- 2008–10** Graduate Student Representative, Department of Atmospheric Sciences.
- 2008–14** Atmospheric Sciences Outreach Volunteer: NASA Climate Day (2013), BF Day Elementary School Science Night (2013), Paws on Science (2012), Polar Science Weekend (2009, 2010), Lake Forest Park Elementary School Science Night (2008, 2009)