

CURRICULUM VITAE – CASEY D. BURLEYSON

EDUCATION

- 2013 Ph.D. Atmospheric Sciences, North Carolina State University
2008 M.S. Applied Physics, Columbia University
2007 B.S. Meteorology, North Carolina State University

EXPERIENCE

- 2019- Scientist III, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
2016-2018 Scientist II, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
2014-2015 Postdoctoral Research Associate, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
2008-2009 Research Staff, Department of Applied Physics and Applied Mathematics, Columbia University

FELLOWSHIPS AND AWARDS

- 2017 PNNL EBSD “BESTie” Award for successful renewal of the ICLASS SFA
2016 PNNL EBSD “BESTie” Award for collaboration across PNNL during the writing of the IM3 SFA Proposal
2014 “Best Talk” Award at the PNNL Postdoctoral Research Symposium
2010-2013 NASA Earth and Space Science Fellowship
2011 NSF DYNAMO Campaign Travel Fellowship
2007-2008 NSF IGERT Fellowship

METRICS

Papers: N = 27 accepted and published, Citations = 759, H-Index = 13, I-10 Index = 17
Technical Reports: N = 1
Invited Talks: N = 6 in the past five years
Lead-Author Conference Presentations: N = 12 in the past five years
Co-Author Conference Presentations: N = 17 in the past five years

PUBLICATIONS (SUBMITTED, ACCEPTED, AND PUBLISHED)

2020

- Burleyson, C. D.**, G. C. Iyer, M. I. Hejazi, S. Kim, P. Kyle, J. S. Rice, A. D. Smith, Z. T. Taylor, N. Voisin, and Y. Xie, 2020: Future western U.S. building electricity consumption in response to climate and population drivers: A comparative study of the impact of model structure. *Energy*, **208**, 118312, doi:10.1016/j.energy.2020.118312.
- Hagos, S., C. Zhang, L. R. Leung, O. Garuba, **C. D. Burleyson**, and K. Balaguru, 2020: Impacts of insolation and soil moisture on seasonality of interactions between the Madden-Julian Oscillation and Maritime Continent. *J. Geophys. Res. Atmos.*, **125**, doi:10.1029/2020JD032382.

Khan, Z., G. C. Iyer, P. L. Patel, S. Kim, M. I. Hejazi, **C. D. Burleyson**, and M. A. Wise, 2020: Impacts of long-term temperature change and variability on electricity investments. Accepted in *Nature Communications* – November 2020.

2019

Hagos, S. M., C. Zhang, L. R. Leung, **C. D. Burleyson**, and K. Balaguru, 2019: Zonal migration of monsoon moisture flux convergence and the strength of Madden-Julian Oscillation events. *Geophys. Res. Lett.*, **46**, doi:10.1029/2019GL083468.

Taylor, Z. T., Y. Xie, **C. D. Burleyson**, N. Voisin, and I. Kraucunas, 2019: A multi-scale calibration approach for process-oriented aggregated building energy demand models. *Energy and Buildings*, **191**, 82-94, doi:10.1016/j.enbuild.2019.02.018.

2018

Burleyson, C. D., S. M. Hagos, Z. Feng, B. W. J. Kerns, and D. Kim, 2018: Large-scale environmental characteristics of MJOs that strengthen and weaken over the Maritime Continent. *J. Climate*, **31**, 5731-5748, doi:10.1175/JCLI-D-17-0576.1.

Burleyson, C. D., N. Voisin, T. Z. Taylor, Y. Xie, and I. Kraucunas, 2018: Simulated building energy demand biases resulting from the use of representative weather stations. *Appl. Energy*, **209**, 516-528, doi:10.1016/j.apenergy.2017.08.244.

Machado, L. A. T., and Coauthors, 2018: Overview: Precipitation characteristics and sensitivities to environmental conditions during GoAmazon2014/5 and ACRIDICON-CHUVA. *Atmos. Chem. Phys.*, **18**, 6461-6482, doi:10.5194/acp-2017-990.

Sakaguchi, K., L. R. Leung, **C. D. Burleyson**, H. Xiao, and H. Wan, 2018: Role of troposphere-convection-land coupling in the southwestern Amazon precipitation bias of the Community Earth System Model version 1 (CESM1). *J. Geophys. Res. Atmos.*, **123**, doi:10.1029/2018JD028999.

Wang, H., **C. D. Burleyson**, P.-L. Ma, J. D. Fast, and P. J. Rasch, 2018: Using the Atmospheric Radiation Measurement (ARM) datasets to evaluate climate models in simulating diurnal and seasonal variations of tropical clouds. *J. Climate*, **31**, 3301-3325, doi:10.1175/JCLI-D-17-0362.1.

2017

Bramer, L. M., J. Rounds, **C. D. Burleyson**, D. Fortin, J. Hathaway, J. Rice, and I. Kraucunas, 2017: Evaluating penalized logistic regression models to predict heat-related electric grid stress days. *Appl. Energy*, **205**, 1408-1418, doi:10.1016/j.apenergy.2017.09.087.

Giangrande, S. E., and Coauthors, 2017: Cloud characteristics, thermodynamic controls and radiative impacts during the Observations and Modeling of the Green Ocean Amazon (GoAmazon2014/5) experiment. *Atmos. Chem. Phys.*, **17**, 14519-14541, doi:10.5194/acp-2017-452.

2016

Burleyson, C. D., Z. Feng, S. M. Hagos, J. Fast, L. A. T. Machado, and S. T. Martin, 2016: Spatial variability of the background diurnal cycle of deep convection around the GoAmazon2014/5 field campaign sites. *J. Appl. Meteor. Climatol.*, **55**, 1579-1598, doi:10.1175/JAMC-D-15-0229.1.

Feng, Z., L. R. Leung, S. Hagos, R. A. Houze Jr., **C. D. Burleyson**, and K. Balaguru, 2016: More frequent intense and long-lived storms dominate the springtime trend in central US rainfall. *Nat. Commun.*, **7**, 13429, doi:10.1038/NCOMMS13429.

Hagos, S. M., Z. Feng, **C. D. Burleyson**, C. Zhao, M. N. Martini, and L. K. Berg, 2016a: Moist process biases in simulations of the Madden-Julian Oscillation episodes observed during the AMIE/DYNAMO field campaign. *J. Climate*, **29**, 1091-1107, doi:10.1175/JCLI-D-15-0349.1.

Hagos, S. M., C. Zhang, Z. Feng, **C. D. Burleyson**, C. de Mott, B. Kerns, J. J. Benedict, and M. N. Martini, 2016b: The impact of the diurnal cycle on the propagation of Madden-Julian Oscillation convection across the Maritime Continent. *J. Adv. Model. Earth Syst.*, **08**, doi:10.1002/2016MS000725.

2015

Burleyson, C. D., C. N. Long, and J. M. Comstock, 2015: Quantifying diurnal cloud radiative effects by cloud type in the tropical western Pacific. *J. Appl. Meteor. Climatol.*, **54**, 1297-1312, doi:10.1175/JAMC-D-14-0288.1.

Burleyson, C. D., and S. E. Yuter, 2015a: Patterns of diurnal marine stratocumulus cloud fraction variability. *J. Appl. Meteor. Climatol.*, **54**, 847-866, doi:10.1175/JAMC-D-14-0178.1.

Burleyson, C. D., and S. E. Yuter, 2015b: Sub-diurnal stratocumulus cloud fraction variability and sensitivity to precipitation. *J. Climate*, **28**, 2968-2985, doi:10.1175/JCLI-D-14-00648.1.

Feng, Z., S. Hagos, A. K. Rowe, **C. D. Burleyson**, M. N. Martini, and S. P. de Szoeke, 2015: Mechanisms of convective cloud organization by cold pools over tropical warm ocean during the AMIE/DYNAMO field campaign. *J. Adv. Model. Earth Syst.*, **7**, doi:10.1002/2014MS000384.

Wilbanks, M., S. E. Yuter, S. P. de Szoeke, W. A. Brewer, M. A. Miller, A. Hall, and **C. D. Burleyson**, 2015: Near-surface density currents observed in the southeast Pacific stratocumulus-topped marine boundary layer. *Mon. Wea. Rev.*, **143**, 3532-3555, doi:10.1175/MWR-D-14-00359.1.

2014

Hagos, S., Z. Feng, **C. D. Burleyson**, K.-S. Lim, C. N. Long, D. Wu, and G. Thompson, 2014: Evaluation of high resolution simulations of cloud populations in Madden-Julian Oscillation using data collected during AMIE/DYNAMO field campaign. *J. Geophys. Res. Atmos.*, **119**, 12052-12068, doi:10.1002/2014JD022143.

2013

Burleyson, C. D., S. P. de Szoeke, S. E. Yuter, M. Wilbanks, and W. A. Brewer, 2013: Ship-based observations of the diurnal cycle of southeast Pacific marine stratocumulus clouds and precipitation. *J. Atmos. Sci.*, **70**, 3876-3894, doi:10.1175/JAS-D-13-01.1.

2012

Allen, G., G. Vaughan, T. Toniazzo, H. Coe, P. Connolly, S. E. Yuter, **C. D. Burleyson**, P. Minnis, and J. K. Ayers, 2012: Gravity-wave induced perturbations in marine stratocumulus. *Quart. J. Roy. Meteor. Soc.*, **139**, 32-45, doi:10.1002/qj.1952.

de Szoeke, S. P., S. E. Yuter, D. Mechem, C. Fairall, **C. D. Burleyson**, and P. Zuidema, 2012: Observations of stratocumulus and their effect on the eastern Pacific surface heat budget along 20°S. *J. Climate*, **25**, 8541- 8566, doi:10.1175/JCLI-D-11-00618.1.

2011

Biasutti, M., S. E. Yuter, **C. D. Burleyson**, and A. H. Sobel, 2011: Very high resolution rainfall patterns measured by TRMM precipitation radar: Seasonal and diurnal cycles. *Clim. Dyn.*, **39**, 239-258, doi:10.1007/s00382-011-1146-6.

Sobel, A. H., **C. D. Burleyson**, and S. E. Yuter, 2011: Rain on small tropical islands. *J. Geophys. Res.*, **116**, D08102, doi:10.1029/2010JD014695.

TECHNICAL REPORTS

Xie Y., **C. D. Burleyson**, I. P. Kraucunas, Z. T. Taylor, and N. Voisin, 2018: *The Building ENergy Demand (BEND) Model: A Comprehensive Composite Building Energy Modeling Framework*, July 2018, PNNL-SA-27687, Richland, WA.

INVITED TALKS (LAST 5 YEARS)

Burleyson, C.D., Z. Guillen, C. Lansing, D. Millard, M. Thomas, and J. Weers, 2020: Opening up: How open-science concepts can help you get work done and make friends too. *MIT Joint Program on the Science and Policy of Global Change Webinar*, October 2020.

Burleyson, C. D., and C. Vernon, 2019: Using common tools to build communities of practice from the ground up. *DOE MultiSector Dynamics Community of Practice Webinar*, November 2019.

Burleyson, C. D., and Coauthors, 2019: Applications of GCAM-USA in the Integrated Multi-sector Multi-scale Modeling (IM3) Project. *JGCRI GCAM Community Modeling Meeting*, November 2019, College Park, MD.

Burleyson, C. D., I. Kraucunas, D. Millard, C. Vernon, and J. Weers, 2018: Advancing a community of practice with a new multisector dynamics data platform. *DOE EESM PI Meeting*, November 2018, Potomac, MD.

Burleyson, C. D., G. Iyer, M. Hejazi, S. Kim, I. Kraucunas, P. Kyle, T. Taylor, N. Voisin, and Y. Xie, 2018: Trees vs. forests views of building energy demand projections. *JGCRI GCAM Community Modeling Meeting*, October 2018, College Park, MD.

Burleyson, C. D., I. Kraucunas, D. Millard, C. Vernon, and J. Weers, 2018: Bridge building at 70 mph: Data management in an active DOE Office of Science project. *USDA Database Integration Workshop: Building the Data Capacity for Food-Energy-Water Research*, September 2018, Raleigh, NC.

LEAD-AUTHOR CONFERENCE PRESENTATIONS (LAST 5 YEARS)

Burleyson, C. D., C. R. Vernon, and J. S. Rice, 2020: Opening up: The benefits of adopting open science principles in a large multi-institutional modeling project. *AGU Fall Meeting 2020*, December 2020, Virtual.

Burleyson, C. D., 2020: How and why to make your work reproducible and extensible. *Joint Workshop on Coastal Integrated Hydro-Terrestrial Modeling (C-IHTM) Webinar*, November 2020.

Burleyson, C. D., G. Iyer, M. Hejazi, S. Kim, P. Kyle, J. Rice, T. Taylor, N. Voisin, and Y. Xie, 2019: Comparing top-down and bottom-up modeling approaches to simulate the impacts of climate and population on building electricity demand. *AGU Fall Meeting 2019*, December 2019, San Francisco, CA.

Burleyson, C. D., I. Kraucunas, C. Lansing, and D. Millard, 2019: Facilitating collaboration across the MultiSector Dynamics community. *Snowmass Energy Modeling Forum*, July 2019, Snowmass, CO.

Burleyson, C. D., D. Millard, C. Vernon, J. Weers, and I. Kraucunas, 2018: Progress and possibilities for data preservation and dissemination in the multisector dynamics community. *AGU Fall Meeting 2018*, December 2018, Washington, D.C.

Burleyson, C. D., I. Kraucunas, D. Millard, C. Vernon, and J. Weers, 2018: Data preservation and dissemination in a large collaborative multisector dynamics project. *DOE EESM PI Meeting*, November 2018, Potomac, MD.

Burleyson, C. D., I. Kraucunas, T. Taylor, N. Voisin, and Y. Xie, 2018: Capturing weather-driven extremes in building energy demand using a process-oriented aggregated building model. *DOE EESM PI Meeting*, November 2018, Potomac, MD.

Burleyson, C. D., Z. Feng, and S. Hagos, 2018: Observing shallow-to-deep convective transitions using ARM GoAmazon2014/5 and geostationary satellite observations. *DOE 2018 ARM ASR PI Meeting*, March 2018, Vienna, VA.

Burleyson, C. D., N. Voisin, Z. Taylor, Y. Xie, and I. Kraucunas, 2017: Novel methods to explore building energy sensitivity to climate and heat waves using PNNL's BEND model. *AGU Fall Meeting 2017*, December 2017, New Orleans, LA.

Burleyson, C. D., S. Hagos, R. Houze, A. Rowe, and Z. Feng, 2017: The role of localized circulations in driving spatial variability in deep tropical convection. *DOE 2017 ARM ASR PI Meeting*, March 2017, Vienna, VA.

Burleyson, C. D., S. Hagos, and Z. Feng, 2016: The impact of the diurnal cycle of clouds and precipitation over the maritime continent on the propagation of the MJO into the western Pacific. *AGU Fall Meeting 2016*, December 2016, San Francisco, CA.

Burleyson, C. D., S. Hagos, and Z. Feng, 2016: The impact of clouds and precipitation over the Maritime Continent on the propagation of the MJO into the Western Pacific. *DOE 2016 ARM ASR PI Meeting*, May 2016, Vienna, VA.

CO-AUTHOR CONFERENCE PRESENTATIONS (LAST 5 YEARS)

Barber, K. A., **C. D. Burleyson**, Z. Feng, and S. M. Hagos, 2020: The response of shallow-to-deep convective transitions to increased shallow cloud populations in the Amazon. *AGU Fall Meeting 2020*, December 2020, Virtual.

Khan, Z., S. H. Kim, M. A. Wise, P. L. Patel, M. I. Hejazi, G. C. Iyer, and **C. D. Burleyson**, 2019: Implications of sub-annual temperature dynamics on the US power sector using GCAM-USA. *AGU Fall Meeting 2019*, December 2019, San Francisco, CA.

Turner, S., K. D. Nelson, **C. D. Burleyson**, J. S. Rice, and C. R. Vernon, 2019: U.S. cities can be classified by the complexity of multisector demands on water supply catchments. *AGU Fall Meeting 2019*, December 2019, San Francisco, CA.

Vernon, C. R., **C. D. Burleyson**, J. S. Rice, I. P. Kraucunas, D. Millard, and J. Weers, 2019: Advancing science through multisector dynamics modeling innovation. *INFORMS Annual Meeting*, October 2019, Seattle, WA.

Hagos, S., C. Zhang, L. R. Leung, **C. D. Burleyson**, and K. Balaguru, 2019: A zonal projection of monsoons and the variability in the strength of the Madden-Julian Oscillation events. *AOGS 16th Annual Meeting*, July 2019, Singapore.

Huang, M., C. Vernon, N. Voisin, **C. D. Burleyson**, M. Hejazi, G. Iyer, J. Rice, and I. Kraucunas, 2019: Toward predictive understanding of multi-scale interactions among energy, water, land, and climate using a flexible and extensible modeling framework. *CUAHSI WSC INFEWS Modeling Workshop*, March 2019, Chapel Hill, NC.

Hagos, S., **C. D. Burleyson**, and C. Zhang, 2018: The disruption of MJO propagation across the Maritime Continent. *AGU Fall Meeting 2018*, December 2018, Washington, D.C.

Vernon, C., **C. D. Burleyson**, I. Kraucunas, D. Millard, and J. Weers, 2018: Examples of best practices for reusability and reproducibility. *iEMSs 2018*, June 2018, Fort Collins, CO.

Hagos, S., **C. D. Burleyson**, and C. Zhang, 2018: The disruption of the Madden-Julian Oscillation propagation across the Maritime Continent. *2nd Pan-GASS Meeting*, March 2018, Lorne, Australia.

Feng, Z., S. Hagos, L. Berg, **C. D. Burleyson**, J. Fast, S. Giangrande, and C. Schumacher, 2018: Impact of shallow cumulus on the surface energy budget and convective cloud populations over the Amazon. *DOE 2018 ARM ASR PI Meeting*, March 2018, Vienna, VA.

Hagos, S., **C. D. Burleyson**, and C. Zhang, 2017: Equatorial asymmetry and the propagation of the Madden-Julian Oscillation across the Maritime Continent. *AGU Fall Meeting 2017*, December 2017, New Orleans, LA.

- Hagos, S., Z. Feng, **C. D. Burleyson**, and R. Houze, 2017: Development of cloud population models. *DOE 2017 ARM ASR PI Meeting*, March 2017, Vienna, VA.
- Feng, Z., S. Hagos, L. Berg, **C. D. Burleyson**, J. Comstock, J. Fast, Y. Qian, C. Schumacher, S. Giangrande, M. Jensen, C. Long, L. Machado, and A. Manzi, 2017: Impact of shallow cumulus on cloud-permitting WRF simulations of the diurnal cycle of deep convection over the Amazon. *AMS Annual Meeting 2017*, January 2017, Seattle, WA.
- Sakaguchi, K., L. R. Leung, **C. D. Burleyson**, and H. Xiao 2016: Exploring convection triggers for wet-season precipitation over the southwestern Amazon in the Community Atmosphere Model Version 5. *AGU Fall Meeting 2016*, December 2016, San Francisco, CA.
- Feng, Z., S. Hagos, L. Berg, **C. D. Burleyson**, J. Comstock, Y. Qian, C. Schumacher, S. Giangrande, and C. Long, 2016: Impact of shallow clouds on cloud-permitting WRF simulations of the diurnal cycle of convection over the Amazon. *DOE 2016 ARM ASR PI Meeting*, May 2016, Vienna, VA.
- Hagos, S., C. Zhang, **C. D. Burleyson**, Z. Feng, J. Benedict, C. de Mott, and M. Martini, 2016: The impact of the diurnal cycle of convection on the propagation of the MJO across the Maritime Continent. *DOE 2016 ARM ASR PI Meeting*, May 2016, Vienna, VA.
- Wang, H., **C. D. Burleyson**, P.-L. Ma, and J. Fast, 2016: Using the long-term ARM Tropical Western Pacific datasets as a tropical testbed for climate models. *DOE 2016 ARM ASR PI Meeting*, May 2016, Vienna, VA.

LEADERSHIP AND SERVICE

- 2019- Co-Chair of the “Facilitating FAIR (Findable, Accessible, Interoperable, and Reusable) Data” Working Group and member of the Scientific Steering Group of the MultiSector Dynamics Community of Practice

TEACHING EXPERIENCE

- 2012 Co-Instructor of Record, Introduction to Weather and Climate
- 2010 Lab Instructor, Fundamentals of Meteorology II
- 2009 Lab Instructor, Fundamentals of Meteorology I
- 2007 Lab Instructor, Introduction to Weather and Climate
- 2009-2013 Guest Lecturer, Introduction to Remote Sensing (9 lectures)

FIELD EXPERIENCE

- 2011-2012 Dynamics of the Madden-Julian Oscillation (DYNAMO)
- 2011 East African Community Atmospheric Observations Feasibility Study
- 2010 Verification of the Origins of Rotation in Tornadoes Experiment 2 (VORTEX-2)

PROFESSIONAL ORGANIZATIONS

2007- American Geophysical Union (AGU)

2006- American Meteorological Society (AMS)

PEER REVIEWER

Journals: Atmospheric Research; Atmospheric Science Letters; Climate Dynamics; Geophysical Research Letters; International Journal of Climatology; Journal of Advances in Modeling Earth Systems; Journal of the Atmospheric Sciences; Journal of Applied Meteorology and Climatology; Journal of Climate; Journal of Geophysical Research

Proposal Panels: NASA CloudSat/CALIPSO Science Team; NASA Modeling, Analysis, and Prediction (MAP) Program; NASA Aqua/Terra Science Team; DOE Atmospheric System Research (ASR) Program; DOE Data Management Program