

# 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

## **EMPLOYMENT**

- 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**

- 2010-2013 NASA Earth and Space Science Fellowship  
2011 NSF DYNAMO Campaign Travel Fellowship  
2007-2008 NSF IGERT Fellowship

## **LINE MANAGEMENT**

- 2021- Team Lead for the Regional and Cloud Modeling (RCM) team

## **PROJECT MANAGEMENT**

- 2021- Lead of the IM3 Total Electricity Load (TELL) modeling team  
2019- Principal Investigator of the MultiSector Dynamics – Living, Intuitive, Value-adding, Environment (MSD-LIVE) collaborative data and computational platform project  
2018- Lead of the IM3 Data, Software, and Collaboration (DSC) team

## **COMMUNITY SERVICE**

- 2019- Co-Chair of the “Facilitating FAIR Data” working group and member of the “Scientific Steering Group” of the MultiSector Dynamics Community of Practice

## **METRICS**

Citations = 997, h-index = 15, i10-index = 21  
Publications: N = 15 in the past five years out of 30 total  
Technical, Workshop, and Community Reports: N = 2 in the past five years out of 2 total  
Invited Presentations: N = 6 in the past five years out of 7 total  
Lead-Author Conference Presentations: N = 11 in the past five years out of 24 total  
Co-Author Conference Presentations: N = 14 in the past five years out of 44 total

**PUBLICATIONS (LAST 5 YEARS)****2022**

Rahman, A., A. D. Smith, Y. Xie, J. Thomas, and **C. D. Burleyson**, 2022: Methodology and analytical approach to investigate the impact of building temperature setpoints. *Journal of Building Performance Simulation*, 15(1), 128-147, doi:10.1080/19401493.2009031.

Reed, P. M., and Coauthors, 2022: MultiSector Dynamics: Advancing the science of complex adaptive human-Earth systems. Submitted to *Earth's Future* – December 2021.

**2021**

Barber, K. A., **C. D. Burleyson**, Z. Feng, and S. M. Hagos, 2021: The influence of shallow cloud populations on transitions to deep convection in the Amazon. Accepted in *J. Atmos. Sci.* – December 2021.

**Burleyson, C. D.**, A. Rahman, J. S. Rice, A. D. Smith, and N. Voisin, 2021: Multiscale effects masked the impact of the COVID-19 pandemic on electricity demand in the United States. *Appl. Energy*, 304, 117711, doi:10.1016/j.apenergy.2021.117711.

Khan, Z., G. C. Iyer, P. L. Patel, S. Kim, M. I. Hejazi, **C. D. Burleyson**, and M. A. Wise, 2021: Impacts of long-term temperature change and variability on electricity investments. *Nat. Commun.*, 12, 1643, doi:10.1038/s41467-021-21785-1.

**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.

**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, 2017: 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.

#### **TECHNICAL, WORKSHOP, AND COMMUNITY REPORTS (LAST 5 YEARS)**

Vallario, B., and Coauthors, 2021: *Coastal Integrated Hydro-Terrestrial Modeling: A Multi-Agency Invited Workshop*, U.S. Global Change Research Program, December 2021.

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 PRESENTATIONS (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*, October 2020, Virtual.

**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*, November 2019, Virtual.

**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, 2021: Ten recommendations to overcome barriers to adopting open science principles. *AGU Fall Meeting 2021*, December 2021, Virtual.

**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)*, November 2020, Virtual.

**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 multi-sector 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, T. 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.

**CO-AUTHOR CONFERENCE PRESENTATIONS (LAST 5 YEARS)**

McGrath, C., **C. D. Burleyson**, Z. Khan, A. Rahman, J. S. Rice, C. R. Vernon, and N. Voisin, 2021: TELL: A python package for predicting the short- and long-term evolution of total electricity loads in the United States. *AGU Fall Meeting 2021*, December 2021, Virtual.

Vernon, C. R., **C. D. Burleyson**, and J. S. Rice, 2021: Reproducibility and meta-repositories: "The power to make the stuff". *AGU Fall Meeting 2021*, December 2021, Virtual.

- 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.
- Smith, A. D., **C. D. Burleyson**, A. Rahman, J. S. Rice, and N. Voisin, 2020: Changes in ComEd load profile data under COVID-19: What is the new normal? *Energy Policy Roundtable*, November 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 16<sup>th</sup> 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. *2<sup>nd</sup> 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.

## **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; Energy Efficiency; 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; Monthly Weather Review; Philosophical Transactions A

*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