

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

- 2022- Scientist IV, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
2019-2022 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 PNNL ASGC 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- Co-lead of the IM3 Data, Software, and Collaboration (DSC) team

SERVICE

- 2022- Climate impacts working group for the Western Electricity Coordinating Council
2019- Member of the “*Scientific Steering Group*” of the MSD Community of Practice

METRICS

- Citations = 1226, h-index = 17, i10-index = 25
Publications: N = 15 in the past five years out of 32 total
Technical, Workshop, and Community Reports: N = 3 in the past five years out of 3 total
Invited Presentations: N = 6 in the past five years out of 7 total
Lead-Author Conference Presentations: N = 13 in the past five years out of 28 total
Co-Author Conference Presentations: N = 14 in the past five years out of 45 total

PUBLICATIONS (LAST 5 YEARS)**2023**

Yan, H., and Coauthors, 2022: A benchmark Community Land Model Version 5 (CLM5) large ensemble dataset to support hydrological applications. Submitted to *Nature Scientific Data* – September 2022.

2022

Barber, K. A., **C. D. Burleyson**, Z. Feng, and S. M. Hagos, 2022: The influence of shallow cloud populations on transitions to deep convection in the Amazon. *J. Atmos. Sci.*, 79(3), 723-743, doi:10.1175/JAS-D-21-0141.1.

McGrath, C., **C. D. Burleyson**, Z. Khan, A. Rahman, T. Thurber, C. R. Vernon, N. Voisin, and J. S. Rice, 2022: tell: a Python package to model future electricity loads. *Journal of Open Source Software*, 7(79), 4472, doi:10.21105/joss.04472.

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. *Earth's Future*, 10, e2021EF002621, doi:10.1029/2021EF002621.

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.

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

Reed, P., and Coauthors, 2022: *MultiSector Dynamics: Scientific Challenges and a Research Vision for 2030*, A Community of Practice Supported by the U.S. Department of Energy's Office of Science, January 2022, doi:10.5281/zenodo.5825890.

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. *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. *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. Bracken, and N. Voisin, 2023: Characterizing heat waves and cold snaps in the WECC. *WECC 10-Year Extreme Heat Working Group*, January 2023, Virtual.

Burleyson, C. D., M. Kulshresta, and J. Rice, 2022: When do different scenarios of future electricity demand start to meaningfully diverge? *AGU Fall Meeting 2022*, December 2022, Chicago, IL.

Burleyson, C. D., J. Rice, J. Kern, Z. Khan, K. Mongird, K. Oikonomou, T. Thurber, C. Vernon, and N. Voisin, 2022: Multi-model coupling to explore electricity system grid stress under energy system transitions and heat waves. *INFORMS Annual Meeting*, October 2022, Indianapolis, IN.

Burleyson, C. D., C. Lansing, Z. Guillen, M. Macduff, D. McAllester, E. Offer, and J. Weers, 2022: The MSD-LIVE data and computational platform. *GCAM Community Modeling Meeting*, June 2022, Virtual.

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.

CO-AUTHOR CONFERENCE PRESENTATIONS (LAST 5 YEARS)

Rice, J. S., and Coauthors, 2022: Modeling interactions and feedbacks across energy, water, land, urban, and economic systems to explore climate vulnerability and resilience in the USA. *Battelle Conference on Innovations in Climate Resilience*, March 2022, Columbus, OH.

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 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.

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; MethodsX; Monthly Weather Review; Nature Scientific Data; 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