Colin M. Zarzycki

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Updated January 30, 2020

EDUCATION

University of Michigan, Ann Arbor, MI, USA. — May 2014
Ph.D. in Atmospheric Science

University of Illinois, Urbana, IL, USA. — August 2010
M.S. in Environmental Engineering

Cornell University, Ithaca, NY, USA. — May 2008
B.S. in Atmospheric Science, *Magna Cum Laude*

PROFESSIONAL EXPERIENCE

Assistant Professor — January 2019 – present
Department of Meteorology and Atmospheric Science
Pennsylvania State University

Project Scientist I — September 2016 – January 2019
Climate & Global Dynamics
Mesoscale & Microscale Meteorology (joint appointment)
National Center for Atmospheric Research

Advanced Study Program (ASP) Postdoctoral Fellow — August 2014 – August 2016
National Center for Atmospheric Research

Postdoctoral Associate — May 2014 – August 2014
University of Michigan

Graduate Research Assistant — August 2010 – May 2014
University of Michigan

Visiting Fellow — August 2012 – November 2012
Isaac Newton Institute for Mathematical Sciences
University of Cambridge

Graduate Research Assistant — August 2008 – August 2010
University of Illinois

PUBLICATIONS

Published, in press, and accepted

34. K. A. Reed, A. M. Stansfield, M. F. Wehner, and **C. M. Zarzycki**. Forecasted attribution of the human influence on hurricane florence. *Science Advances*, 6(1), 2020. doi: 10.1126/sciadv.aaw9253

33. Y. Moon, D. Kim, S. J. Camargo, A. A. Wing, A. H. Sobel, H. Murakami, K. A. Reed, E. Scoccimarro, G. A. Vecchi, M. F. Wehner, **C. M. Zarzycki**, and M. Zhao. Azimuthally averaged wind and thermodynamic structures of tropical cyclones in global climate models and their sensitivity to horizontal resolution. *Journal of Climate*, 2020. doi: 10.1175/JCLI-D-19-0172.1
32. A. A. Wing, S. J. Camargo, A. H. Sobel, D. Kim, Y. Moon, H. Murakami, K. A. Reed, G. A. Vecchi, M. F. Wehner, **C. Zarzycki**, and M. Zhao. Moist static energy budget analysis of tropical cyclone intensification in high-resolution climate models. *Journal of Climate*, 32(18): 6071–6095, 2019. doi: 10.1175/JCLI-D-18-0599.1
31. L. van Kampenhout, A. M. Rhoades, A. R. Herrington, **C. M. Zarzycki**, J. T. M. Lenaerts, W. J. Sacks, and M. R. van den Broeke. Regional grid refinement in an Earth system model: impacts on the simulated Greenland surface mass balance. *The Cryosphere*, 13(6):1547–1564, 2019. doi: 10.5194/tc-13-1547-2019
30. **C. M. Zarzycki**, C. Jablonowski, J. Kent, P. H. Lauritzen, R. Nair, K. A. Reed, P. A. Ullrich, D. M. Hall, M. A. Taylor, D. Dazlich, R. Heikes, C. Konor, D. Randall, X. Chen, L. Harris, M. Giorgetta, D. Reinert, C. Kühnlein, R. Walko, V. Lee, A. Qaddouri, M. Tanguay, H. Miura, T. Ohno, R. Yoshida, S.-H. Park, J. B. Klemp, and W. C. Skamarock. DCMIP2016: the splitting supercell test case. *Geoscientific Model Development*, 12(3):879–892, 2019. doi: 10.5194/gmd-12-879-2019
29. A. Gettelman, H. Morrison, K. Thayer-Calder, and **C. M. Zarzycki**. The impact of rimed ice hydrometeors on global and regional climate. *Journal of Advances in Modeling Earth Systems*, 11(6):1543–1562, 2019. doi: 10.1029/2018MS001488
28. E. A. Burakowski, A. Tawfik, A. Ouimette, L. Lepine, **C. Zarzycki**, K. Novick, S. Ollinger, and G. Bonan. Simulating surface energy fluxes using the variable-resolution Community Earth System Model (VR-CESM). *Theoretical and Applied Climatology*, 138(1):115–133, 2019. doi: 10.1007/s00704-019-02785-0
27. R. J. Small, R. Msadek, Y.-O. Kwon, J. F. Booth, and **C. Zarzycki**. Atmosphere surface storm track response to resolved ocean mesoscale in two sets of global climate model experiments. *Climate Dynamics*, 52:2067–2089, 2018. doi: 10.1007/s00382-018-4237-9
26. **C. M. Zarzycki**. Projecting changes in societally impactful northeastern U.S. snowstorms. *Geophysical Research Letters*, 45(21):12,067–12,075, 2018. doi: 10.1029/2018GL079820
25. M. Gross, H. Wan, P. J. Rasch, P. M. Caldwell, D. L. Williamson, D. Klocke, C. Jablonowski, D. R. Thatcher, N. Wood, M. Cullen, B. Beare, M. Willett, F. Lemari, E. Blayo, S. Malardel, P. Termonia, A. Gassmann, P. H. Lauritzen, H. Johansen, **C. M. Zarzycki**, K. Sakaguchi, and R. Leung. Physicsdynamics coupling in weather, climate, and Earth system models: Challenges and recent progress. *Monthly Weather Review*, 146(11):3505–3544, 2018. doi: 10.1175/MWR-D-17-0345.1
24. A. M. Rhoades, P. A. Ullrich, **C. M. Zarzycki**, H. Johansen, S. A. Margulis, H. Morrison, Z. Xu, and W. D. Collins. Sensitivity of mountain hydroclimate simulations in variable-resolution CESM to microphysics and horizontal resolution. *Journal of Advances in Modeling Earth Systems*, 10(6):1357–1380, 2018. doi: 10.1029/2018MS001326
23. P. H. Lauritzen, R. D. Nair, A. R. Herrington, P. Callaghan, S. Goldhaber, J. M. Dennis, J. T. Bacmeister, B. E. Eaton, **C. M. Zarzycki**, M. A. Taylor, P. A. Ullrich, T. Dubos, A. Gettelman, R. B. Neale, B. Dobbins, K. A. Reed, C. Hannay, B. Medeiros, J. J. Benedict, and J. J. Tribbia. NCAR release of CAM-SE in CESM2.0: A reformulation of the spectral element dynamical core in dry-mass vertical coordinates with comprehensive treatment of condensates and energy. *Journal of Advances in Modeling Earth Systems*, 10(7):1537–1570, 2018. doi: 10.1029/2017MS001257

22. A. Gettelman, P. Callaghan, V. E. Larson, **C. M. Zarzycki**, J. T. Bacmeister, P. H. Lauritzen, P. A. Bogenschutz, and R. B. Neale. Regional climate simulations with the Community Earth System Model. *Journal of Advances in Modeling Earth Systems*, 10(6):1245–1265, 2018. doi: 10.1002/2017MS001227
21. F. He, D. J. Posselt, N. N. Narisetty, **C. M. Zarzycki**, and V. N. Nair. Application of multivariate sensitivity analysis techniques to AGCM-simulated tropical cyclones. *Monthly Weather Review*, 146(7):2065–2088, 2018. doi: 10.1175/MWR-D-17-0265.1
20. A. M. Rhoades, P. A. Ullrich, and **C. M. Zarzycki**. Projecting 21st century snowpack trends in western USA mountains using variable-resolution CESM. *Climate Dynamics*, 50(1):261–288, 2018. doi: 10.1007/s00382-017-3606-0
19. E. Burakowski, A. Tawfik, A. Ouimette, L. Lepine, K. Novick, S. Ollinger, **C. Zarzycki**, and G. Bonan. The role of surface roughness, albedo, and Bowen ratio on ecosystem energy balance in the Eastern United States. *Agricultural and Forest Meteorology*, 249:367–376, 2018. doi: 10.1016/j.agrformet.2017.11.030
18. **C. M. Zarzycki** and P. A. Ullrich. Assessing sensitivities in algorithmic detection of tropical cyclones in climate data. *Geophysical Research Letters*, 44(2):1141–1149, 2017. doi: 10.1002/2016GL071606
17. **C. M. Zarzycki**, D. R. Thatcher, and C. Jablonowski. Objective tropical cyclone extratropical transition detection in high-resolution reanalysis and climate model data. *Journal of Advances in Modeling Earth Systems*, 9(1):130–148, 2017. doi: 10.1002/2016MS000775
16. P. A. Ullrich, C. Jablonowski, J. Kent, P. H. Lauritzen, R. Nair, K. A. Reed, **C. M. Zarzycki**, D. M. Hall, D. Dazlich, R. Heikes, C. Konor, D. Randall, T. Dubos, Y. Meurdesoif, X. Chen, L. Harris, C. Kühnlein, V. Lee, A. Qaddouri, C. Girard, M. Giorgetta, D. Reinert, J. Klemp, S.-H. Park, W. Skamarock, H. Miura, T. Ohno, R. Yoshida, R. Walko, A. Reinecke, and K. Viner. DCMIP2016: a review of non-hydrostatic dynamical core design and intercomparison of participating models. *Geoscientific Model Development*, 10(12):4477–4509, 2017. doi: 10.5194/gmd-10-4477-2017
15. C. Wu, X. Liu, Z. Lin, A. M. Rhoades, P. A. Ullrich, **C. M. Zarzycki**, Z. Lu, and S. R. Rahimi-Esfarjani. Exploring a variable-resolution approach for simulating regional climate in the Rocky Mountain region using the VR-CESM. *Journal of Geophysical Research: Atmospheres*, 122(20):10,939–10,965, 2017. doi: 10.1002/2017JD027008
14. P. A. Ullrich and **C. M. Zarzycki**. TempestExtremes: a framework for scale-insensitive pointwise feature tracking on unstructured grids. *Geoscientific Model Development*, 10(3):1069–1090, 2017. doi: 10.5194/gmd-10-1069-2017
13. **C. M. Zarzycki**. Tropical cyclone intensity errors associated with lack of two-way ocean coupling in high-resolution global simulations. *Journal of Climate*, 29(23):8589–8610, 2016. doi: 10.1175/JCLI-D-16-0273.1
12. **C. M. Zarzycki**, K. A. Reed, J. T. Bacmeister, A. P. Craig, S. C. Bates, and N. A. Rosenbloom. Impact of surface coupling grids on tropical cyclone extremes in high-resolution atmospheric simulations. *Geoscientific Model Development*, 9(2):779–788, 2016. doi: 10.5194/gmd-9-779-2016
11. X. Huang, A. M. Rhoades, P. A. Ullrich, and **C. M. Zarzycki**. An evaluation of the variable-resolution CESM for modeling California's climate. *Journal of Advances in Modeling Earth Systems*, 8(1):345–369, 2016. doi: 10.1002/2015MS000559
10. A. M. Rhoades, X. Huang, P. A. Ullrich, and **C. M. Zarzycki**. Characterizing Sierra Nevada snowpack using variable-resolution CESM. *Journal of Applied Meteorology and Climatology*, 55 (1):173–196, 2016. doi: 10.1175/JAMC-D-15-0156.1

9. **C. M. Zarzycki** and C. Jablonowski. Experimental tropical cyclone forecasts using a variable-resolution global model. *Monthly Weather Review*, 143(10):4012–4037, 2015. doi: 10.1175/MWR-D-15-0159.1
8. K. J. E. Walsh, S. J. Camargo, G. A. Vecchi, A. S. Daloz, J. Elsner, K. Emanuel, M. Horn, Y.-K. Lim, M. Roberts, C. Patricola, E. Scoccimarro, A. H. Sobel, S. Strazzo, G. Villarini, M. Wehner, M. Zhao, J. P. Kossin, T. LaRow, K. Oouchi, S. Schubert, H. Wang, J. Bacmeister, P. Chang, F. Chauvin, C. Jablonowski, A. Kumar, H. Murakami, T. Ose, K. A. Reed, R. Saravanan, Y. Yamada, **C. M. Zarzycki**, P. L. Vidale, J. A. Jonas, and N. Henderson. Hurricanes and climate: the U.S. CLIVAR working group on hurricanes. *Bulletin of the American Meteorological Society*, 96(6):997–1017, 2015. doi: 10.1175/BAMS-D-13-00242.1
7. F. He, D. J. Posselt, **C. M. Zarzycki**, and C. Jablonowski. A balanced tropical cyclone test case for AGCMs with background vertical wind shear. *Monthly Weather Review*, 143(5):1762–1781, 2015. doi: 10.1175/MWR-D-14-00366.1
6. **C. M. Zarzycki**, C. Jablonowski, D. R. Thatcher, and M. A. Taylor. Effects of localized grid refinement on the general circulation and climatology in the Community Atmosphere Model. *Journal of Climate*, 28(7):2777–2803, 2015. doi: 10.1175/JCLI-D-14-00599.1
5. **C. M. Zarzycki** and C. Jablonowski. A multidecadal simulation of Atlantic tropical cyclones using a variable-resolution global atmospheric general circulation model. *Journal of Advances in Modeling Earth Systems*, 6(3):805–828, 2014. doi: 10.1002/2014MS000352
4. **C. M. Zarzycki**, M. N. Levy, C. Jablonowski, J. R. Overfelt, M. A. Taylor, and P. A. Ullrich. Aquaplanet experiments using CAM's variable-resolution dynamical core. *Journal of Climate*, 27(14):5481–5503, 2014. doi: 10.1175/JCLI-D-14-00004.1
3. **C. M. Zarzycki**, C. Jablonowski, and M. A. Taylor. Using variable resolution meshes to model tropical cyclones in the Community Atmosphere Model. *Monthly Weather Review*, 142 (3):1221–1239, 2014. doi: 10.1175/MWR-D-13-00179.1
2. T. C. Bond, **C. Zarzycki**, M. G. Flanner, and D. M. Koch. Quantifying immediate radiative forcing by black carbon and organic matter with the Specific Forcing Pulse. *Atmospheric Chemistry and Physics*, 11(4):1505–1525, 2011. doi: 10.5194/acp-11-1505-2011
1. **C. M. Zarzycki** and T. C. Bond. How much can the vertical distribution of black carbon affect its global direct radiative forcing? *Geophysical Research Letters*, 37(20):L20807, 2010. doi: 10.1029/2010GL044555

Books and book chapters

- M. F. Wehner, **C. M. Zarzycki**, and C. Patricola. Estimating the human influence on tropical cyclone intensity as the climate changes. In J. M. Collins and K. Walsh, editors, *Hurricane Risk*, pages 235–260. Springer Books, 2019. ISBN 978-3-030-02402-4
- M. F. Wehner, K. A. Reed, and **C. M. Zarzycki**. High-resolution multi-decadal simulation of tropical cyclones. In J. M. Collins and K. Walsh, editors, *Hurricanes and Climate Change*, volume 3, pages 187–211. Springer Books, 2017. ISBN 978-3-319-47592-9

Theses, proceedings, extended abstracts, and other non peer-reviewed

- Paul A. Ullrich, **Colin M. Zarzycki** (2016). "Variable and adaptive resolution climate modeling with applications in subseasonal to seasonal extreme weather prediction." *Variations*, U.S. CLIVAR, Winter 2016 issue
- **Colin M. Zarzycki** (2014). "Variable-resolution frameworks for the simulation of tropical cyclones in global atmospheric general circulation models." *Doctoral thesis*, University of Michigan, 224 pages, 2027.42/108788

- **Colin M. Zarzycki**, Christiane Jablonowski (2012). "Using variable-resolution meshes to model tropical cyclones in NCAR's CAM general circulation model." *Proceedings of the 30th American Meteorological Society Conference on Hurricanes and Tropical Meteorology*, extended abstract, 6D.4.
- **Colin M. Zarzycki** (2010). "Effects of incomplete combustion on atmospheric chemistry: Black carbon climate forcing and global carbon monoxide emissions." *Master's thesis*, University of Illinois, 77 pages, 2142/17014

AWARDED GRANTS AND PROPOSALS

Funded grants

- **Colin Zarzycki**, Vince Larson, Julio Bacmeister, George Bryan, Ming Zhao, Leo Donner, Gunilla Svensson. "Improving modeled momentum flux in the atmospheric boundary layer." *NOAA/NSF*, Lead Principal Investigator, 2019-2022 ($2,102,000 to PSU)
- Rachel McCrary, **Colin Zarzycki**, Melissa Bukovsky. "Future changes in the frequency of winter snow storms and their impact on snowfall and snow water equivalent." *NOAA*, Co-Principal Investigator, 2019-2021 ($48,000 to PSU)
- Paul Ullrich, ..., **Colin Zarzycki**, ... et al. "A Framework for Improving Analysis and Modeling of Earth System and Intersectoral Dynamics at Regional Scales." *Department of Energy, Office of Biological and Environmental Research*, Co-Principal Investigator, 2019-2022 ($1,073,000 to PSU)
- Paul Ullrich, ..., **Colin Zarzycki**, ... et al. "Project Hyperion: An integrated evaluation of the simulated hydroclimate system of the continental U.S." *Department of Energy, Office of Biological and Environmental Research*, Co-Principal Investigator, 2016-2019 ($6,000,000 total)
- Paul Ullrich, Richard Grotjahn, **Colin Zarzycki**, Weile Wang, Ramakrishna Nemani. "TempestExtremes: Indicators of change in the characteristics of extreme weather." *NASA Strategic Research Objectives (ROSES-2014)*, Collaborator, 2016-2018 ($518,000 total)
- **Colin M. Zarzycki**. "Development and implementation of next-generation variable-resolution general circulation models." *NCAR Advanced Study Program*, Lead Principal Investigator, 2014-2016 (approximately $300,000 total)

Other successful proposals

- Andrew Gettelman, **Colin Zarzycki**, Bill Skamarock, Julio Bacmeister, Peter Lauritzen, Richard Neale, Jean-Francois Lamarque, David Lawrence. "CESM2 Regional Climate Community Simulations." *National Science Foundation, National Center for Atmospheric Research, Accelerated Scientific Discovery (ASD)*, 2017 (13.7M core hour computing allocation)

PRESENTATIONS

Invited

- **Colin M. Zarzycki***. "Safety in numbers: Beyond deterministic thinking when classifying extreme weather on climate timescales" *School of Marine and Atmospheric Sciences TAOS Seminar*, Stony Brook, NY, USA, May 2019 (talk)

- **Colin M. Zarzycki***. "Gauging hurricane intensity errors in high-resolution AGCMs with simplified ocean models" *CASPO seminar at Scripps Institution of Oceanography*, La Jolla, CA, USA, March 2019 (talk)
- **Colin M. Zarzycki***. "Breakthroughs and challenges simulating extreme weather at beyond weather timescales" *Seminar presentation at Penn State University in Department of Meteorology*, State College, PA, USA, February 2018 (talk)
- **Colin M. Zarzycki***. "How can we identify extreme weather features in next-generation global climate models?" *Noble Seminar Series at University of Toronto in Department of Physics*, Toronto, Ontario, Canada, October 2017 (talk)
- **Colin M. Zarzycki***. "Capturing extreme weather with next-generation climate models" *NCAR Day of Networking and Discovery*, Boulder, CO, April 2017 (talk)
- **Colin M. Zarzycki***. "Improving our understanding of climate extremes with next-generation global modeling frameworks" *Seminar presentation at University of Colorado Boulder in Department of Atmospheric and Oceanic Sciences*, Boulder, CO, USA, April 2016 (talk)
- **Colin M. Zarzycki***. "Next-generation atmospheric modeling using variable-resolution global grids" *Seminar presentation at University of Kansas in Department of Geography and Atmospheric Science*, Lawrence, KS, USA, January 2016 (talk)
- **Colin M. Zarzycki***. "Blurring the separation between weather and climate scales with variable-resolution global modeling." *Meteorology and Climate - Modeling for Air Quality*, Sacramento, CA, September 2015 (talk)
- **Colin M. Zarzycki***. "Bridging the gap: Improving weather and climate simulations with variable-resolution global models" *Seminar presentation at Purdue University in Department of Earth, Atmospheric, and Planetary Sciences*, West Lafayette, IN, USA, January 2015 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Variable-resolution CAM-SE: A tool to both achieve and assess high regional resolution." *NCAR Climate and Global Dynamics Seminar Series*, Boulder, CO, December 2014 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Physics scaling in multi-resolution CAM simulations." *Physics Dynamics Coupling in Geophysical Models - Bridging the Gap*, Ensenada, Mexico, December 2014 (talk)
- Christiane Jablonowski*, **Colin M. Zarzycki**, Mark A. Taylor. "Advancing the frontiers of tropical cyclone modeling with the variable-resolution general circulation model CAM-SE." *World Weather Open Science Conference*, Montreal, Canada, August 2014 (talk)
- Christiane Jablonowski*, **Colin M. Zarzycki**. "New frontiers: Tropical cyclone modeling with NCAR's variable-resolution general circulation model CAM-SE." *European Geoscience Union (EGU) General Assembly*, Vienna, Austria, April 2014 (talk)
- **Colin Zarzycki***. "Application of a variable-resolution global model to simulate tropical cyclones at weather and climate timescales." *Seminar presentation in Naval Research Lab Marine Meteorology Division*, Monterrey, CA, USA, April 2014 (talk)
- Christiane Jablonowski*, **Colin Zarzycki**, Mark A. Taylor, Hans Johanson, Phillip Colella. "Pushing the frontiers of high-resolution climate modeling." *University of Michigan CyberInfrastructure (CI) Days*, Ann Arbor, MI, November 2013 (keynote talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Application of variable-resolution CAM-SE to simulate extreme weather events in a global model." *Traversing New Terrain in Meteorological Modeling*, Davis, CA, September 2013 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski. "Utilizing grid refinement in the cubed-sphere spectral element option of CAM to model tropical cyclones." *Society for Industrial and Applied Mathematics Conference on Computational Science and Engineering*, Boston, MA, February 2013 (talk)

Selected contributed (first author only)

- **C. M. Zarzycki** and P. A. Ullrich. Metrics for appraising tropical cyclones in climate data, December 2019. *American Geophysical Union Fall Conference*, San Francisco, CA (poster)
- **C. M. Zarzycki**. Strength in numbers: using climate ensembles to study extreme weather phenomena on long timescales, July 2019. *U.S. CLIVAR Large Ensemble Workshop*, Boulder, CO (talk)
- **C. M. Zarzycki**. Assessing cam tropical cyclones with an objective metric suite, June 2019. *NCAR Community Earth System Model Workshop*, Boulder, CO (poster)
- **C. M. Zarzycki** and A. Rhoades. Storm-level metrics for categorizing the societal and hydrological impacts of northeastern u.s. winter storms, May 2019. *Columbia University Workshop on Correlated Extreme Events*, New York, NY (talk)
- **C. M. Zarzycki**. Betacast-ing: Tools for initialized case studies in cesm and e3sm, February 2019. *CESM Atmospheric Model Working Group Meeting*, Boulder, CO (talk)
- **C. M. Zarzycki**. Future snowmageddons? projecting changes in extreme northeastern u.s. snowstorms with a large climate ensemble, January 2019. *32nd Conference on Climate Variability and Change, 99th Annual American Meteorological Society Meeting*, Phoenix, AZ (talk)
- **C. M. Zarzycki**. Empty nesting: Where do you need high resolution to accurately simulate Atlantic hurricane impacts in climate models?, December 2018. *American Geophysical Union Fall Meeting*, A34D-03, Washington DC (talk)
- **C. M. Zarzycki**, A. M. Rhoades, K. A. Reed, A. M. Stansfield, and P. A. Ullrich. Investigating new coastal storm metrics and domain size sensitivity over the Eastern U.S. with a multi-decadal VR-CESM ensemble, November 2018. *Department of Energy Earth and Environmental Systems Modeling PI Meeting*, Potomac, MD (poster)
- **C. M. Zarzycki**. The intersection of weather, climate, and societal hazards: projecting future 'Snowmageddons' with the CESM Large Ensemble, October 2018. *NCAR Climate and Global Dynamics Seminar Series*, Boulder, CO (talk)
- **C. M. Zarzycki**. Domain size: how big is "big enough" to accurately simulate Atlantic hurricane climatology?, June 2018. *NCAR Community Earth System Model Workshop*, Boulder, CO (poster)
- **C. M. Zarzycki**. What can real-time weather forecasts using SE and MPAS teach us about CAM?, February 2018. *CESM Atmospheric Model Working Group Meeting*, Boulder, CO (talk)
- **C. M. Zarzycki**, A. Gettelman, and S.-H. Park. North American extreme weather in CESM2: Regionally-refined simulations with next generation dynamical cores, January 2018. *31st Conference on Climate Variability and Change, 98th Annual American Meteorological Society Meeting*, Austin, TX (talk)
- **C. M. Zarzycki**. Finding Snowmageddon: Detecting and quantifying northeastern U.S. snowstorms in a multi-decadal global climate ensemble, December 2017. *American Geophysical Union Fall Conference*, New Orleans, LA (talk)
- **C. M. Zarzycki**. Early investigations of climate extremes in variable-resolution CESM2 experiments, June 2017. *NCAR Community Earth System Model Workshop*, Boulder, CO (talk)
- **C. M. Zarzycki**. Hurricane prediction using initialized high-resolution CESM, June 2017. *NCAR Community Earth System Model Workshop*, Boulder, CO (talk)
- **C. M. Zarzycki**, K. A. Reed, C. Jablonowski, P. A. Ullrich, J. D. Kent, P. H. Lauritzen, and R. D. Nair. The Dynamical Core Model Intercomparison Project (DCMIP-2016): Results of the supercell test case, December 2016. *American Geophysical Union Fall Conference*, San Francisco, CA (poster)

- **C. M. Zarzycki**. Tracking extremes in climate data: community defragging and understanding uncertainty, October 2016. *NCAR Climate and Global Dynamics Seminar Series*, Boulder, CO (talk)
- **C. M. Zarzycki**, K. A. Reed, J. T. Bacmeister, A. P. Craig, S. C. Bates, and N. A. Rosenbloom. Errors in extreme winds due to choice of physics computation grid in high-resolution atmospheric simulations, September 2016. *Physics Dynamics Coupling in Weather and Climate Models*, Richland, WA (talk)
- **C. M. Zarzycki**. The sensitivity of objectively-tracked east coast winter storms to horizontal resolution in variable-resolution CAM, June 2016. *NCAR Community Earth System Model Workshop*, Breckenridge, CO (poster)
- **C. M. Zarzycki**. Tropical cyclone intensity errors associated with lack of two-way ocean coupling in high-resolution global simulations, April 2016. *32nd AMS Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico (talk)
- **C. M. Zarzycki**. Using the CESM Large Ensemble to project future changes in the distribution and impacts of eastern North American snowstorms, February 2016. *CESM Climate Variability and Change Model Working Group Meeting*, Boulder, CO (talk)
- **C. M. Zarzycki**, P. Bogenschutz, P. Callaghan, J. Bacmeister, A. Gettelman, and J. Truesdale. Preliminary changes in high-resolution tropical cyclone climatology in CAM5.5, February 2016. *CESM Atmospheric Model Working Group Meeting*, Boulder, CO (talk)
- **C. M. Zarzycki**. Assessing the sensitivity of simulated east coast winter storms to horizontal resolution using variable-resolution CAM, December 2015. *American Geophysical Union Fall Conference*, San Francisco, CA (poster)
- **C. M. Zarzycki**. Using an idealized slab ocean to diagnose tropical cyclone intensity biases associated with prescribed SSTs in CAM-SE, June 2015. *NCAR Community Earth System Model Workshop*, Breckenridge, CO (poster)
- **C. M. Zarzycki**. Do tropical cyclone cold wakes impact storm climatology in a high-resolution global model?, June 2015. *5th International Summit on Hurricanes and Climate Change*, Crete, Greece (talk)
- **C. M. Zarzycki**. Why are tropical cyclones so intense in CAM5 at ultra-high resolutions?, February 2015. *CESM Atmospheric Model Working Group Meeting*, Boulder, CO (talk)
- **C. M. Zarzycki** and C. Jablonowski. Improving tropical cyclone track and intensity in a global model with local mesh refinement, December 2014. *American Geophysical Union Fall Conference*, San Francisco, CA (talk)
- **Colin M. Zarzycki***. "Enhancing regional climatology in a global atmospheric model with variable-resolution." *4th Annual Young Scientist Symposium on Atmospheric Research (YSSAR)*, Fort Collins, CO, October 2014 (talk)
- **Colin Zarzycki***. "Evaluating the impact of localized grid refinement on global climatology in CAM." *NCAR Community Earth System Model Workshop*, Breckenridge, CO, June 2014 (talk)
- **Colin Zarzycki***, Christiane Jablonowski, Mark A. Taylor, Michael N. Levy. "Using idealized tests to diagnose the impact of physical parameterizations on atmospheric simulations." *Department of Energy Principal Investigators Meeting*, Potomac, MD, USA, May 2014 (poster)
- **Colin Zarzycki***, Michael N. Levy, Christiane Jablonowski, Mark A. Taylor. "The impact of localized grid refinement on sub-grid parameterization in idealized climate experiments." *Solutions to Partial Differential Equations on the Sphere*, Boulder, CO, USA, April 2014 (poster)
- **Colin Zarzycki***, Christiane Jablonowski. "Deterministic forecasts of tropical cyclones using a variable-resolution global model." *31st American Meteorological Society Conference on Hurricanes and Tropical Meteorology*, San Diego, CA, USA, April 2014 (talk)

- **Colin Zarzycki***, Christiane Jablonowski, Diana Thatcher, Michael Levy, and Mark Taylor (2014). "The impacts of high-resolution refinement in variable-resolution CAM-SE on regional climate in CESM." *CESM Atmospheric Model Working Group Meeting*, Boulder, CO, USA, February 2014 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski (2013). "Evaluating the impact of localized GCM grid refinement on regional tropical cyclone climatology and synoptic variability using variable-resolution CAM-SE." *American Geophysical Union Fall Conference*, San Francisco, CA, December 2013 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski. "High-resolution tropical cyclone climate simulations in NCAR's variable-resolution general circulation model, CAM-SE." *4th International Summit on Hurricanes and Climate Change*, Kos, Greece, June 2013 (poster)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Assessing the ability of variable-resolution global models to forecast tropical cyclones." *Special Symposium on Advancing Weather and Climate Forecasts: Innovative Techniques and Applications, 93rd Annual American Meteorological Society Meeting*, Austin, TX, January 2013 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Using the variable-resolution general circulation model CAM-SE to simulate regional tropical cyclone climatology." *American Geophysical Union Fall Conference*, San Francisco, CA, December 2012 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski. "Improving weather prediction and regional climate modeling through the use of variable-resolution global atmospheric models." *University of Michigan Engineering Graduate Symposium*, Ann Arbor, MI, November 2012 (poster)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Evaluating variable-resolution CAM-SE with high-resolution forecast simulations." *Weather and Climate Prediction on Next Generation Supercomputers*, UK Met Office, Exeter, UK, October 2012 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor. "Improving tropical cyclone representation in general circulation models through the use of variable resolution." *Solutions to Partial Differential Equations on the Sphere*, Cambridge, UK, September 2012 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor, Michael N. Levy. "Tropical cyclone modeling using CAM-SE's variable-resolution option." *NCAR Community Earth System Model Workshop*, Breckenridge, CO, June 2012 (poster)
- **Colin M. Zarzycki***, Christiane Jablonowski. "Using variable-resolution meshes to model tropical cyclones in NCAR's CAM general circulation model." *30th American Meteorological Society Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra Beach, FL, April 2012 (talk)
- **Colin M. Zarzycki***, Christiane Jablonowski, Mark A. Taylor, Michael N. Levy. "Modeling tropical cyclones in NCAR's general circulation model with variable-resolution meshes." *American Geophysical Union Fall Conference*, San Francisco, CA, December 2011 (talk)
- **Colin M. Zarzycki***, Tami C. Bond. "How much can the vertical distribution of black carbon affect its global direct radiative forcing?." *University of Michigan Engineering Graduate Symposium*, Ann Arbor, MI, November 2010 (poster)
- **Colin Zarzycki***, Tami C. Bond. "The contribution of black carbon above clouds to global average forcing." *University of Illinois at Urbana-Champaign Environmental Engineering and Science Symposium*, Urbana, IL, April 2010 (talk)
- **Colin Zarzycki***, Tami C. Bond. "The contribution of black carbon above clouds to global average forcing." *American Geophysical Union Fall Conference*, San Francisco, CA, December 2009 (poster)

- **Colin Zarzycki***, Tami C. Bond. "A multi-model assessment of black carbon effects on high-latitude warming in the Arctic." *University of Illinois at Urbana-Champaign Environmental Engineering and Science Symposium*, Urbana, IL, April 2009 (talk)
- **Colin Zarzycki***, Gena Renninger, Stina Bridgeman, Neil Laird. "Weather conditions associated with rapid variations in Lake Erie ice cover." *Annual Lake Effect Weather Conference*, Oswego, NY, October 2007 (talk)

Students advised

- **Michelle Gore**, Ph.D. student, Penn State University, 2018–present.
- **Kyle Nardi**, Ph.D. student, Penn State University, 2018–present.
- **Kimberly Brothers**, Significant Opportunities in Atmospheric Research and Science (SOARS) student, science mentor, NCAR, 2018.
- **Adam Herrington**, Ph.D. student, Stony Brook University, dissertation committee member, 2017 – present.
- **Nkosi 'Kos' Muse**, Significant Opportunities in Atmospheric Research and Science (SOARS) student, science mentor, NCAR, 2017.
- **Benjamin 'David' Dillahunt**, NSF Research Experiences for Undergraduates (REU) student, science mentor, University of Michigan, 2014.

Service and Outreach

- *Member*, High Resolution Model Intercomparison Project (HighResMIP)
- *Member*, Working Group on Hurricanes and Climate Change, U.S. Climate Variability and Predictability Research Program (CLIVAR)
- *Member*, NOAA Next Generation Global Prediction System (NGGPS) Nesting (Dynamics) Team
- *Co-Organizer*, Dynamical Core Model Intercomparison Project (DCMIP)
- *Associate Editor*, Monthly Weather Review (2016 – 2019)
- *Panel Reviewer*, Department of Energy, Office of Science
- *Journal Reviewer*, Atmosphere, Climate Dynamics, Geophysical Model Development, Geophysical Research Letters, Journal of Advances in Modeling Earth Systems, Journal of Climate, Journal of Geophysical Research: Atmospheres, Michigan Journal of Sustainability, Monthly Weather Review, Nature, Science of the Total Environment, Quarterly Journal of the Royal Meteorological Society
- *Proceedings Reviewer*, International Conference on Computer Science
- *Session Convener, Chair, OSPA Liason*, AGU Fall Meeting
- *Session Co-Convener*, EGU Annual Meeting
- *Model Mentor (CAM-SE)*, Dynamical Core Model Intercomparison Project (DCMIIP)
- *Committee Chair*, NCAR Thompson Lecture Series

- *Science Teacher*, NCAR Super Science Saturday
- *Forecaster and Meteorological Liaison*, Jackson (MI) Hot Air Balloon Jubilee

HONORS AND AWARDS

- *CGD Special Recognition Award*, National Center for Atmospheric Research, December 2017
- *AGU Editors' Highlight*, for 'Assessing sensitivities in algorithmic detection of tropical cyclones in climate data,' American Geophysical Union, January 2017
- *NSF Early Career Travel Grant*, National Science Foundation, June 2015 ($1,505)
- *Advanced Study Program (ASP) Postdoctoral Fellowship*, National Center for Atmospheric Research, September 2014 – September 2016
- *AGU Publication Highlight*, for 'A multidecadal simulation of Atlantic tropical cyclones using a variable-resolution global atmospheric general circulation model,' American Geophysical Union, November 2014
- *ProQuest Distinguished Dissertation Honorable Mention*, University of Michigan, November 2014
- *University of Michigan Rackham Predoctoral Fellowship*, University of Michigan, May 2013 – April 2014
  - "Supports outstanding doctoral students working on dissertation[s] that are unusually creative, ambitious and risk-taking."
- *Student Travel Grant*, Aegean Conferences, June 2013 ($1,000)
- *University of Michigan Rackham Travel Grant*, University of Michigan, 2011 - 2012 ($700), 2012 - 2013 ($950), 2013 – 2014 ($700)
- *AMS Weather and Forecasting Symposium Competition: 1st place, Best Oral Presentation*, American Meteorological Society, Austin, TX, January 2012
- *Engineering Graduate Symposium Competition: 1st place, Best Paper Award, Earth Science and Remote Sensing Session*, University of Michigan, November 2012
- *University of Michigan Rackham Graduate Student Research Grant*, University of Michigan, August 2012 ($3,000)
- *University of Michigan College of Engineering Dean's Fellowship*, University of Michigan, August 2010 – May 2011
- *Ivan Racheff Fellowship*, University of Illinois, August 2008 – June 2009
- *Frank and Rosa Rhodes Scholarship*, Cornell University, October 2007
  - "Rewards and encourages one outstanding scholar annually from each of the seven undergraduate colleges."

SELECTED MEDIA

- The Washington Post. "With climate change, Washington may have entered era of more blockbuster snowstorms but less snow overall," November 2019 (Link).
- Mashable. "NASA scientist Kate Marvel lays out the unpleasant realities of rising seas," September 2019 (Link).
- Scientific American. "Love Snow? Heres How Its Changing," January 2019 (Link).
- The Atlantic. "Hurricane Michael's remarkable, terrifying run," October 2018 (Link).
- Mashable. "Remarkably warm oceans spawned 2017's massive hurricanes," September 2018 (Link).
- Bloomberg. "Florence's Unique Path From Africa to US Tied to Global Warming," September 2018 (Link).
- ABC Radio National. "Devastating hurricane bears down on the East Coast of US," September 2018.
- The Washington Post. "Hurricanes are moving more slowly – which makes them even more dangerous," June 2018, (Link).
- CNN. "Hurricanes are slowing, which could be a big problem," June 2018, (Link).
- The Palm Beach Post. "State soaking: Florida shatters May rain record by astonishing margin," June 2018, (Link).
- WIRED. "The National Weather Service Overhauls Its Forecasts and Sets Off a Nerd Fight," July 2016, (Link).
- AGUniverse. "Publication Highlight: A multidecadal simulation of Atlantic tropical cyclones using a variable-resolution global atmospheric general circulation model," November 2014.

PROFESSIONAL ORGANIZATIONS

- *American Meteorological Society*, Member, Fall 2006 – present
- *American Geophysical Union*, Member, Spring 2009 – present