

Angeline G. Pendergrass

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EDUCATION and TRAINING

2006 B.S. University of Miami, Majors: Meteorology/Math and Physics (Minor: French)
2009 M.S. University of Washington, Department of Atmospheric Sciences
2013 Ph.D. University of Washington, Department of Atmospheric Sciences
2014-16 Advanced Studies Program Postdoctoral Research Fellow, National Center for
Atmospheric Research, Climate and Global Dynamics Laboratory
2016 Cooperative Institute for Research in Environmental Sciences (CIRES) Visiting
Research Fellow, University of Colorado-Boulder

PROFESSIONAL APPOINTMENTS

9/1/2020- Assistant Professor, Earth and Atmospheric Science, Cornell University
2019-20 Academic guest, Institute for Climate and Atmospheric Physics, ETH-Zurich,
Switzerland
2016- Project Scientist I, Climate and Global Dynamics, National Center for Atmospheric
Research

PUBLICATIONS

46 peer-reviewed, published scientific articles

Metrics [5 September 2021]

	Google scholar	Web of Science
h-index	26	22
Total citations	2,392	1,779

Selected Articles

Pendergrass, A. G., 2020: The Global-Mean Precipitation Response to CO₂-Induced Warming in CMIP6 Models. *Geophys. Res. Lett.*, **47**, e2020GL089964, [doi:10.1029/2020GL089964](https://doi.org/10.1029/2020GL089964).

Pendergrass, A. G., 2020: Changing Degree of Convective Organization as a Mechanism for Dynamic Changes in Extreme Precipitation. *Current Climate Change Reports*, **6**, 47–54, [doi:10.1007/s40641-020-00157-9](https://doi.org/10.1007/s40641-020-00157-9).

Pendergrass, Meehl, Pulwarty, Hobbins, Hoell, AghaKhouchak, Bonfils, Gallant, Hoerling, Hoffmann, Kaatz, Lehner, Llewellyn, Mote, Neale, Overpeck, Sheffield, Stahl, Svoboda, Wheeler, Wood, and Woodhouse, 2020: Flash droughts present a new challenge for subseasonal-to-seasonal prediction. *Nature Climate Change*, **10**, 191–199, [doi:10.1038/s41558-020-0709-0](https://doi.org/10.1038/s41558-020-0709-0).

Pendergrass, A. G., D. B. Coleman, C. Deser, F. Lehner, N. Rosenbloom, and I. R. Simpson, 2019: Nonlinear Response of Extreme Precipitation to Warming in CESM1. *Geophys. Res. Lett.*, **46**, 10551–10560, [doi:10.1029/2019GL084826](https://doi.org/10.1029/2019GL084826).

- Pendergrass, A. G., and R. Knutti, 2018: The Uneven Nature of Daily Precipitation and Its Change. *Geophys. Res. Lett.*, [doi:10.1029/2018GL080298](https://doi.org/10.1029/2018GL080298).
- Pendergrass, A. G., 2018: What precipitation is extreme? *Science*, **360**, 1072–1073, [doi:10.1126/science.aat1871](https://doi.org/10.1126/science.aat1871).
- Pendergrass, A. G., and C. Deser, 2017: Climatological characteristics of typical daily precipitation. *J. Clim.*, **30**, 5985–6003, [doi:10.1175/JCLI-D-16-0684.1](https://doi.org/10.1175/JCLI-D-16-0684.1).
- Pendergrass, A. G., K. A. Reed, and B. Medeiros, 2016: The link between extreme precipitation and convective organization in a warming climate: Global radiative-convective equilibrium simulations. *Geophys. Res. Lett.*, **43**, [doi:10.1002/2016GL071285](https://doi.org/10.1002/2016GL071285).
- Pendergrass, A. G., R. Knutti, F. Lehner, C. Deser, and B. M. Sanderson, 2017: Precipitation variability increases in a warmer climate. *Scientific Reports*, **7**, 17966, [doi:10.1038/s41598-017-17966-y](https://doi.org/10.1038/s41598-017-17966-y).
- Pendergrass, A. G., and E. P. Gerber, 2016: The rain is askew: Two idealized models relating vertical velocity and precipitation distributions in a warming world. *J. Clim.*, **29**, [doi:10.1175/JCLI-D-16-0097.1](https://doi.org/10.1175/JCLI-D-16-0097.1).
- Pendergrass, A. G., F. Lehner, B. M. Sanderson, and Y. Xu, 2015: Does extreme precipitation intensity depend on the emissions scenario? *Geophys. Res. Lett.*, **42**, 8767–8774, [doi:10.1002/2015GL065854](https://doi.org/10.1002/2015GL065854).
- Pendergrass, A. G., and D. L. Hartmann, 2014: Changes in the distribution of rain frequency and intensity in response to global warming. *J. Clim.*, **27**, [doi:10.1175/JCLI-D-14-00183.1](https://doi.org/10.1175/JCLI-D-14-00183.1).
- Pendergrass, A. G., and D. L. Hartmann, 2014: Two modes of change of the distribution of rain. *J. Clim.*, **27**, 8357–8371, [doi:10.1175/JCLI-D-14-00182.1](https://doi.org/10.1175/JCLI-D-14-00182.1).
- Pendergrass, A. G., A. Conley, and F. M. Vitt, 2018: Surface and top-of-atmosphere radiative feedback kernels for CESM-CAM5. *Earth System Science Data*, **10**, 317–324, <https://doi.org/10.5194/essd-10-317-2018>.
- Pendergrass, A. G., and D. L. Hartmann, 2014: The atmospheric energy constraint on global-mean precipitation change. *J. Clim.*, **27**, 757–768, [doi:10.1175/JCLI-D-13-00163.1](https://doi.org/10.1175/JCLI-D-13-00163.1).
- Pendergrass, A. G., and D. L. Hartmann, 2012: Global-mean precipitation and black carbon in AR4 simulations. *Geophys. Res. Lett.*, **39**, [doi:10.1029/2011GL050067](https://doi.org/10.1029/2011GL050067).
- Byrne, M. P., A. G. Pendergrass, A. D. Rapp, and K. R. Wodzicki, 2018: Response of the Intertropical Convergence Zone to Climate Change: Location, Width, and Strength. *Current Climate Change Reports*, **4**, 355–370, [doi:10.1007/s40641-018-0110-5](https://doi.org/10.1007/s40641-018-0110-5).
- Sippel, S., Meinshausen, N., Székely, E., Fischer, E., Pendergrass, A.G., Lehner, F. and Knutti, R., 2021: Robust detection of forced warming in the presence of potentially large climate variability. *Science Advances*.
- Sippel, Meinshausen, Merrifield, Lehner, Pendergrass, Fischer, and Knutti, 2019: Uncovering the forced climate response from a single ensemble member using statistical learning. *J. Clim.*, JCLI-D-18-0882.1, [doi:10.1175/JCLI-D-18-0882.1](https://doi.org/10.1175/JCLI-D-18-0882.1).
- Heinze-Deml, C., S. Sippel, A. G. Pendergrass, F. Lehner, and N. Meinshausen, 2020: Latent Linear Adjustment Autoencoders v1.0: A novel method for estimating and emulating

- dynamic precipitation at high resolution. *Geoscientific Model Development Discussions*, 1–39, [doi:10.5194/gmd-2020-275](https://doi.org/10.5194/gmd-2020-275).
- Brunner, L., A. G. Pendergrass, F. Lehner, A. L. Merrifield, R. Lorenz, and R. Knutti, 2020: Reduced global warming from CMIP6 projections when weighting models by performance and independence. *Earth System Dynamics*, **11**, 995–1012, <https://doi.org/10.5194/esd-11-995-2020>.
- Sanderson, B. M., A. Pendergrass, C. D. Koven, F. Brient, B. B. Booth, R. A. Fisher, and R. Knutti, 2021: The potential for structural errors in emergent constraints. *Earth System Dynamics*. <https://doi.org/10.5194/esd-12-899-2021>.
- Simpson, I. R., S. Tilmes, J. H. Richter, B. Kravitz, D. G. MacMartin, M. J. Mills, J. T. Fasullo, and A. G. Pendergrass, 2019: The Regional Hydroclimate Response to Stratospheric Sulfate Geoengineering and the Role of Stratospheric Heating. *J. Geophys. Res.: Atmospheres*, **124**, 12587–12616, [doi:10.1029/2019JD031093](https://doi.org/10.1029/2019JD031093).
- Gottelman, Hannay, Bacmeister, Neale, Pendergrass, Danabasoglu, Lamarque, Fasullo, Bailey, and Lawrence, 2019: High Climate Sensitivity in the Community Earth System Model Version 2 (CESM2). *Geophysical Research Letters*, 2019GL083978, <https://doi.org/10.1029/2019GL083978>.
- Prein, A. F., and A. G. Pendergrass, 2019: Can we Constrain Uncertainty in Hydrologic Cycle Projections? *Geophys. Res. Lett.*, 2018GL081529, [doi:10.1029/2018GL081529](https://doi.org/10.1029/2018GL081529).
- Sanderson, B. M., Y. Xu, C. Tebaldi, M. Wehner, B. O'Neill, A. Jahn, A.G. Pendergrass, F. Lehner, W.G. Strand, L. Lin, R. Knutti, and J.F. Lamarque, 2017: Community climate simulations to assess avoided impacts in 1.5 and 2°C futures. *Earth System Dynamics*, **8**, 827–847, <https://doi.org/10.5194/esd-8-827-2017>.
- Kim, H., S. M. Kang, K. Takahashi, A. Donohoe, and A. G. Pendergrass, 2020: Mechanisms of tropical precipitation biases in climate models. *Clim Dyn*, [doi:10.1007/s00382-020-05325-z](https://doi.org/10.1007/s00382-020-05325-z).
- Kramer, R. J., B. J. Soden, A. G. Pendergrass, 2019: Evaluating Climate Model Simulations of the Radiative Forcing and Radiative Response at Earth's Surface. *Journal of Climate*, **32**, 4089–4102, <https://doi.org/10.1175/JCLI-D-18-0137.1>.
- Kay, J. E., T. L'Ecuyer, A. Pendergrass, H. Chepfer, R. Guzman, and V. Yettella, 2018: Scale-Aware and Definition-Aware Evaluation of Modeled Near-Surface Precipitation Frequency Using CloudSat Observations. *Journal of Geophysical Research: Atmospheres*, **123**, 4294–4309, [doi:10.1002/2017JD028213](https://doi.org/10.1002/2017JD028213).
- Akinsanola, A. A., G. J. Kooperman, K. A. Reed, A. G. Pendergrass, and W. M. Hannah, 2020: Projected changes in seasonal precipitation extremes over the United States in CMIP6 simulations. *Environ. Res. Lett.*, [doi:10.1088/1748-9326/abb397](https://doi.org/10.1088/1748-9326/abb397).
- Akinsanola, A. A., G. J. Kooperman, A. G. Pendergrass, W. M. Hannah, and K. A. Reed, 2020: Seasonal representation of extreme precipitation indices over the United States in CMIP6 present-day simulations. *Environ. Res. Lett.*, [doi:10.1088/1748-9326/ab92c1](https://doi.org/10.1088/1748-9326/ab92c1).
- Donohoe, A., K. C. Armour, A. G. Pendergrass, and D. S. Battisti, 2014: Shortwave and longwave radiative contributions to global warming under increasing CO₂. *Proceedings of*

the National Academy of Sciences, **111**, 16700–16705,
<https://doi.org/10.1073/pnas.1412190111>.

Pendergrass, A. G., G. J. Hakim, D. S. Battisti, and G. Roe, 2012: Coupled Air–Mixed Layer Temperature Predictability for Climate Reconstruction. *Journal of Climate*, **25**, 459–472,
<https://doi.org/10.1175/2011JCLI4094.1>.

Pendergrass, A. G., and H. E. Willoughby, 2009: Diabatically induced secondary flows in tropical cyclones. Part I: Quasi-steady forcing. *Monthly Weather Review*, **137**,
<https://doi.org/10.1175/2008MWR2657.1>.

AWARDS

- 2020 Department of Energy Earth and Environmental System Modeling Certificate of Excellence
GRL Top 10% of downloaded paper, 2018-2019, Pendergrass and Knutti (2018)
- 2019 UCAR Distinguished Achievement and Outstanding Accomplishment Award for Diversity (awardee as UNEION team member, CGD nominee as Inclusive Meetings team lead)
- 2018 *Science* Editor’s Choice
CFMIP 2018 Early Career Presentation Award
- 2016 American Geophysical Union Editor’s Citation for Excellence in Refereeing
Geophysical Research Letters Research Spotlight
- 2015 Outstanding AGU Reviewer
CIRES Postdoctoral Visiting Research Fellowship
- 2014 GEWEX Early Career Scientist Presentation Certificate of Excellence
- 2013 NCAR Advanced Studies Program Postdoctoral Fellowship
- 2012 *Science* Editor’s Choice, Pendergrass and Hartmann (2012)
- 2006 National Defense Science and Engineering Graduate Research Fellowship
Achievement Rewards for College Scientists (ARCS) Fellowship
University of Washington Program on Climate Change Fellow (Honorary)

MENTORING

Undergraduate researcher. Kinen Kao, Cornell University, Spring 2021-Spring 2022
Co-supervisor, MS thesis. Marius Egli, ETH-Zurich (2020-2021)
Primary supervisor, BS semester project. Joel Küttel, ETH-Zurich (2020)
Collaborator, PhD student. Hanjun Kim (Pusan National University, South Korea) (2018 -)
Mentor. Qin Yang (NCAR visitor from Chongqing Climate Center, funded by China Scholarship Council), 2019
PhD committee member and collaborator. Ryan Kramer (University of Miami)
Collaborator, PhD students. William Frey and Vineel Yettella (University of Colorado), 2016

TEACHING

Physical Meteorology, EAS 4470, Fall 2021 (Cornell University)
Atmospheric Dynamics Lab, EAS 3421 (joint with Peter Hitchcock), Spring 2021 (Cornell University)

SCIENTIFIC PRESENTATIONS

Selected, invited

- 2022 AMS Conference of Hydrology, Precipitation Processes session (virtual)
- 2021 Indiana University – Bloomington Department of Earth and Atmospheric Sciences Colloquium (in person)
University of Washington; Columbia University Lamont-Doherty Earth Observatory, MIT PAOC (virtual)
- 2020 Harvard University, University of Chicago, University of Reading (UK), ECS & Cloud Feedback Virtual Symposium, University of Washington Program on Climate Change Summer Institute, (virtual)
ETH-Zurich (Switzerland), Australian Meteorological and Oceanographic Society (plenary) (in person)
- 2019 University of Bern (Switzerland), University of New South Wales and Monash University (Australia)
- 2018 Princeton University, Carnegie Institution for Science, Lawrence Livermore National Lab
- 2015 Scripps Institution of Oceanography, Colorado State University
- 2014 Caltech, New York University, SUNY Albany, Max Planck Institute for Meteorology (Germany), University of Miami
- 2013 NASA Jet Propulsion Laboratory

Scientific committee service including (currently) US National Climate Assessment (NCA5) Chapter 2: Earth System Processes author, NOAA CMIP6 Task Force co-lead, Aspen Global Change Institute science committee, Climate Data Guide board of advisors, and (recently) Intergovernmental Panel on Climate Change 6th Assessment Report water cycle changes chapter contributing author.

Scientific meeting organization including NOAA-DOE *Precipitation Processes and Predictability* workshop science committee member (2020), primary convener for European Geophysical Union 2020 session *Evaluating and improving precipitation in climate models*, primary organizer for *Using Observationally Based Metrics to Evaluate and Improve Earth System Model Precipitation* DOE Workshop (2019), and organizer for Aspen Global Change Institute workshop *When the rain stops* (2018)

Media coverage including [Wired](#), [Gizmodo](#), [Weather.com](#), [Business Insider](#), [Boulder Daily Camera](#), [foxnews.com](#), [Spektrum.de](#), TV on [9 News Denver](#), live radio on [Colorado Public Radio](#), and podcast on [Vox Unexplainable](#).

Equity and inclusion activities such as founding member of board of directors of 500 Women Scientists, lead organizer of workshop and report on inclusive scientific meetings, co-facilitator of institutional training series (and member of award-winning team), and departmental committee member at Cornell (2020/21)

Outreach including presentations at public groups and partnership with adventure-based environmental education non-profit Open Adventure Rowing Northwest.