

Benjamin R. Hillman

Senior Member of Technical Staff

Org 08931, Sandia National Laboratories, Albuquerque, New Mexico

<https://orcid.org/0000-0002-9264-9872>

bhillma@sandia.gov // (425) 218-8086

Professional Preparation

Ph.D., Atmospheric Sciences, University of Washington, Seattle, WA, June 2016

M.S., Atmospheric Sciences, University of Washington, Seattle, WA, 2012

B.S., Physics and Mathematics *Cum Laude*, Western Washington University, Bellingham, WA, 2008

A.S., Shoreline Community College, Seattle, WA, 2005

Appointments and Positions

2017 – Present: Senior Member of Technical Staff, Sandia National Laboratories, Albuquerque, NM

2016 – 2017: Postdoctoral Appointee, Sandia National Laboratories, Albuquerque, NM

2008 – 2016: Graduate Research Associate, Department of Atmospheric Sciences, University of Washington, Seattle, WA

Synergistic Activities

- Lead of the current SCREAM simulation campaign to produce the first decadal-scale simulation with a global storm resolving model at 3 km resolution.

Selected publications

- [1] A. S. Donahue, P. M. Caldwell, L. Bertagna, H. Beydoun, P. A. Bogenschutz, A. Bradley, T. C. Clevenger, J. G. Foucar, J.-C. Golaz, O. Guba, W. M. Hannah, B. R. Hillman, J. Johnson, N. D. Keen, W. Lin, B. Singh, M. A. Taylor, J. Tian, C. R. Terai, P. Ullrich, X. Yuan, and Y. Zhang, “To exascale and beyond – the simple cloud-resolving e3sm atmosphere model (scream), a performance portable global atmosphere model for cloud-resolving scales,” Mar. 2024.
- [2] M. Taylor, P. M. Caldwell, L. Bertagna, C. Clevenger, A. Donahue, J. Foucar, O. Guba, B. Hillman, N. Keen, J. Krishna, M. Norman, S. Sreepathi, C. Terai, J. B. White, A. G. Salinger, R. B. McCoy, L.-y. R. Leung, D. C. Bader, and D. Wu, “The simple cloud-resolving e3sm atmosphere model running on the frontier exascale system,” in *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, SC ’23, (New York, NY, USA), Association for Computing Machinery, 2023.
- [3] X. Zhang, H. Tang, J. Zhang, J. E. Walsh, E. L. Roesler, B. Hillman, T. J. Ballinger, and W. Weijer, “Arctic cyclones have become more intense and longer-lived over the past seven decades,” *Communications Earth & Environment*, vol. 4, no. 1, p. 348, 2023.
- [4] Q. Tang, J.-C. Golaz, L. P. Van Roekel, M. A. Taylor, W. Lin, B. R. Hillman, P. A. Ullrich, A. M. Bradley, O. Guba, J. D. Wolfe, T. Zhou, K. Zhang, X. Zheng, Y. Zhang, M. Zhang, M. Wu, H. Wang,

- C. Tao, B. Singh, A. M. Rhoades, Y. Qin, H.-Y. Li, Y. Feng, Y. Zhang, C. Zhang, C. S. Zender, S. Xie, E. L. Roesler, A. F. Roberts, A. Mametjanov, M. E. Maltrud, N. D. Keen, R. L. Jacob, C. Jablonowski, O. K. Hughes, R. M. Forsyth, A. V. Di Vittorio, P. M. Caldwell, G. Bisht, R. B. McCoy, L. R. Leung, and D. C. Bader, "The fully coupled regionally refined model of E3SM version 2: overview of the atmosphere, land, and river results," *Geoscientific Model Development*, vol. 16, no. 13, pp. 3953–3995, 2023.
- [5] J.-C. Golaz, L. P. Van Roekel, X. Zheng, A. F. Roberts, J. D. Wolfe, W. Lin, A. M. Bradley, Q. Tang, M. E. Maltrud, R. M. Forsyth, C. Zhang, T. Zhou, K. Zhang, C. S. Zender, M. Wu, H. Wang, A. K. Turner, B. Singh, J. H. Richter, Y. Qin, M. R. Petersen, A. Mametjanov, P.-L. Ma, V. E. Larson, J. Krishna, N. D. Keen, N. Jeffery, E. C. Hunke, W. M. Hannah, O. Guba, B. M. Griffin, Y. Feng, D. Engwirda, A. V. Di Vittorio, C. Dang, L. M. Conlon, C.-C.-J. Chen, M. A. Brunke, G. Bisht, J. J. Benedict, X. S. Asay-Davis, Y. Zhang, M. Zhang, X. Zeng, S. Xie, P. J. Wolfram, T. Vo, M. Veneziani, T. K. Tesfa, S. Sreepathi, A. G. Salinger, J. E. J. Reeves Eyre, M. J. Prather, S. Mahajan, Q. Li, P. W. Jones, R. L. Jacob, G. W. Huebler, X. Huang, B. R. Hillman, B. E. Harrop, J. G. Foucar, Y. Fang, D. S. Comeau, P. M. Caldwell, T. Bartoletti, K. Balaguru, M. A. Taylor, R. B. McCoy, L. R. Leung, and D. C. Bader, "The DOE E3SM Model Version 2: Overview of the physical model and initial model evaluation," *Journal of Advances in Modeling Earth Systems*, vol. 14, no. 12, p. e2022MS003156, 2022. e2022MS003156 2022MS003156.
- [6] M. R. Norman, D. C. Bader, C. Eldred, W. M. Hannah, B. R. Hillman, C. R. Jones, J. M. Lee, L. Leung, I. Lyngaas, K. G. Pressel, S. Sreepathi, M. A. Taylor, and X. Yuan, "Unprecedented cloud resolution in a gpu-enabled full-physics atmospheric climate simulation on olcf's summit supercomputer," vol. 36, 2022.
- [7] P. M. Caldwell, C. R. Terai, B. Hillman, N. D. Keen, P. Bogenschutz, W. Lin, H. Beydoun, M. Taylor, L. Bertagna, A. M. Bradley, T. C. Clevenger, A. S. Donahue, C. Eldred, J. Foucar, J.-C. Golaz, O. Guba, R. Jacob, J. Johnson, J. Krishna, W. Liu, K. Pressel, A. G. Salinger, B. Singh, A. Steyer, P. Ullrich, D. Wu, X. Yuan, J. Shpund, H.-Y. Ma, and C. S. Zender, "Convection-permitting simulations with the e3sm global atmosphere model," *Journal of Advances in Modeling Earth Systems*, vol. 13, no. 11, p. e2021MS002544, 2021. e2021MS002544 2021MS002544.
- [8] J. Wang, J. Fan, Z. Feng, K. Zhang, E. Roesler, B. Hillman, J. Shpund, W. Lin, and S. Xie, "Impact of a new cloud microphysics parameterization on the simulations of mesoscale convective systems in e3sm," *Journal of Advances in Modeling Earth Systems*, vol. 13, no. 11, p. e2021MS002628, 2021. e2021MS002628 2021MS002628.
- [9] W. M. Hannah, C. R. Jones, B. R. Hillman, M. R. Norman, D. C. Bader, M. A. Taylor, L. R. Leung, M. S. Pritchard, M. D. Branson, G. Lin, K. G. Pressel, and J. M. Lee, "Initial results from the super-parameterized e3sm," *Journal of Advances in Modeling Earth Systems*, vol. 12, no. 1, p. e2019MS001863, 2020. e2019MS001863 10.1029/2019MS001863.
- [10] B. R. Hillman, R. T. Marchand, and T. P. Ackerman, "Sensitivities of simulated satellite views of clouds to subgrid-scale overlap and condensate heterogeneity," *Journal of Geophysical Research: Atmospheres*, vol. 123, no. 14, pp. 7506–7529, 2018.
- [11] B. R. Hillman, R. T. Marchand, T. P. Ackerman, G. G. Mace, and S. Benson, "Assessing the accuracy of misr and misr-simulated cloud top heights using cloudsat- and calipso-retrieved hydrometeor profiles," *Journal of Geophysical Research: Atmospheres*, vol. 122, no. 5, pp. 2878–2897, 2017.
- [12] J. E. Kay, B. R. Hillman, S. A. Klein, Y. Zhang, B. Medeiros, R. Pincus, A. Gettelman, B. Eaton, J. Boyle, R. Marchand, and T. P. Ackerman, "Exposing global cloud biases in the community atmosphere model (cam) using satellite observations and their corresponding instrument simulators," *Journal of Climate*, vol. 25, no. 15, pp. 5190 – 5207, 2012.