CURRICULUM VITAE, FEBRUARY 2025

MIMI ABEL

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Formerly known as Mimi Hughes

EDUCATION

Ph.D. Atmospheric and Ocean Sciences, University of California, Los Angeles, CA, 2008

M.S. Atmospheric and Oceanic Sciences, University of California, Los Angeles, CA, 2004

B.S. Electrical Engineering (Magna cum laude) and Mathematics (Cum laude), Pennsylvania State University, University Park, PA, 2002

PROFESSIONAL EXPERIENCE

June 2019-present. 40 hours/week. Research Meteorologist (ZP 1340 IV from July 2021 – present ; ZP 1340 III from June 2019-July 2021)
NOAA Physical Scientist Laboratory Hydrology Applications Division

My current research focuses broadly on improving the understanding and modeling of hydrometeorological processes, for their improved prediction (weather time scales) and projection (climate time scales). In particular I study processes that impact water resources (e.g., rain and snow distribution in the mountainous Western U.S.), extreme events (e.g., droughts and floods), and the representation of those processes in NOAA models.

As of mid-2022, I became the lead of the **Hydrometeorology Modeling Team** within the division, where I lead a team of ~10 members, serving as supervisors for four of the federal staff on my team. In this role I cultivate a productive team work environment, foster high-quality/high-impact research, and execute associated team administrative and fiscal duties.

Jan. 2016-June 2019. 40 hours/week. CIRES Team lead (Federal scientist lead R. Cifelli); NOAA ESRL PSD Hydrometeorological Modeling and Applications team.

Co-led the hydrometeorological modeling and applications team in NOAA ESRL PSD (now PSL). Responsibilities included engaging in activities to assist CIRES management in collaboration with OAR and PSD, ensuring alignment of team activities with strategic priorities under the Cooperative Agreement and grants, serving as research team lead and CIRES supervisor, performing other team leadership duties, serving as a member of the PSD Research Council, and working to foster integration of research across PSD.

Oct. 2010-June 2019. 40 hours/week. Research Scientist
CIRES, University of Colorado, Boulder, CO, and NOAA ESRL PSD

Hydrometeorological extremes: I investigated the representation of hydrometeorological extremes (droughts and floods) in the National Water Model, a hydrology model built from the WRF-Hydro modeling system.

Extreme precipitation in mid-latitude mountains: I researched atmospheric rivers and orographic precipitation using regional reanalysis downscalings, reanalyses, regional climate models, and observations. I focused on understanding what controls the distribution of orographic precipitation when wintertime cyclones impinge on the western United States' topography, and the connections between these features of regional climate and the global climate system.

Arctic science: I was involved in the testing and development of the Regional Arctic System Model, and helped establish the PSD version of that model (now the Coupled Arctic Forecast System, CAFS). I also worked to understand the distribution of extreme Arctic winds and their impact on sea ice.

Oct. 2008-Sept. 2010. 40 hours/week. Postdoctoral Research Associate
NOAA ESRL PSD Water Cycle Branch Boulder, CO

Generated an 11-year, 6km downscaling of California with WRF. Validated this downscaling against wind-profiler data and sounding data to assess its applicability for investigations of dynamics of the Sierra Barrier Jet. Investigated low-frequency variability and trends of Santa Ana winds in observations over the past half-century. Generated meteorological data for ARkStorm.

Sept. 2002-Sept. 2008. 20 hours/week. Research Assistant
Climate Sensitivity Research Lounge Los Angeles, CA

Researched mesoscale climate dynamics of Southern California using a high-resolution (6km) climate reconstruction created with MM5. I focused on three aspects of the climate that are unresolvable by traditional climate models: the diurnal cycle of surface air temperature and wind, the interaction of topography with precipitation, and the dynamical causes of the Santa Ana winds. Advisor: Dr. Alex Hall.

2000-2002 Undergraduate Research Assistant
Atmospheric Sensing and Lidar Lab University Park, PA

Designed and built the receiver for a Rayleigh Lidar, focusing on the integration of optical choppers into the system. Advisor: Dr. Tim Kane

1999–2000 Co-operative Education Student
Applied Research Laboratory University Park, PA

Implemented and tested a nonlinear machine learning algorithm for adaptive filtering (a neural network). Tested its robustness compared to both signal/noise ratio and number of input signals.

TEACHING EXPERIENCE

2014 CU Boulder, Atmos. and Ocean. Sci. Boulder, CO

Guest lecturer: ATOC 5050 – Introductory dynamics

2014 **CU Boulder, Atmos. and Ocean. Sci.** **Boulder, CO**
Instructor: ATOC 1050 – Weather and the Atmosphere

2005 **UCLA Dept. of Atmos. and Ocean. Sci.** **Los Angeles, CA**
Teaching Assistant: AOS 1 – Climate Change: from puzzles to policy

1999 **Learning Resource Center** **University Park, PA**
Supplemental Instruction Leader – Introduction to Statistics

PUBLICATIONS

Towler, E, Stovern, D, Acharya, N, **Abel, MR,** Currier, WR, Bellier, J, Cifelli, R, Mahoney, K, Mossel, C, Scheuerer, M, Thorstensen, A, Viterbo, F (2025): Implementing and evaluating National Water Model ensemble streamflow predictions using post-processed precipitation forecasts. *J Hydromet.* In review.

Rugg, A, McCrary, R, Rhoades, A, Yates, D, **Abel, M,** Devineni, N (2025): Robust Drying Projected in Colorado Despite Uncertainties in Precipitation's Response to Climate Change. *Env. Res. Communications.* Submitted.

Sthapit, E, **Abel, MR,** Currier, WR, Cifelli, R, Fickenscher, P (2025): Evaluating Data-driven and an Operational Model to Estimate Snow Water Equivalent in the Sierra Nevada*. J. Hydro.: Regional Studies.* Submitted.

Currier, WC, McCrary, R, **Abel, MR,** Eidhammer, T, Kruyt, B, Smith, A, Enzminger, T, Mahoney, K, Cifelli, R, and Gutmann, ED (2025): End-of-century changes in orographic precipitation with the Intermediate Complexity Atmospheric Research Model over the western United States. *J. Hydromet.* In review.

Abel, M.R., Behl, M., Kladzyk Constantino, A., and Kellerman, A. (2024). Mentors as Career Investors to Empower Women's Leadership in Geosciences. *Nature Reviews Earth and Environment.* https://doi.org/10.1038/s43017-024-00581-7 .

Heflin, S, **M Abel**, et al. (2024) X-band Radar and Surface-based Observations of Cold Season Precipitation in Western Colorado's Complex Terrain. *J. Hydromet.* https://doi.org/10.1175/JHM-D-23-0147.1.

Currier, W.R., McCrary, R., **Abel, M.R.,** Eidhammer, T., Kruyt, B., Smith, A., Enzminger, R., Mahoney, K.M., Cifelli, R., and Gutmann E.D. (2024): End-of-century changes in orographic precipitation with the Intermediate Complexity Atmospheric Research Model over the western United States. *J. Hydromet.* In review.

Towler, E., Stovern, D., Acharya, N., **Abel, M.R.,** Currier, W.R., Bellier, J., Cifelli, R., Mahoney, K.M., Mossel, C., Scheuerer, M., Thorstensen, A., Viterbo, F., 2024: Improving National Water Model ensemble streamflow predictions using post-processed precipitation forecasts. *J. Hydromet*. In review.

Bytheway, J. L., W. R. Currier, **M.R. Abel,** K. Mahoney, and R. Cifelli, 2024: Evaluation of Wintertime Precipitation Estimates and Forecasts in the Mountains of Colorado. *J. Hydrometeor.,* 25, 565–579, https://doi.org/10.1175/JHM-D-23-0158.1.

Hughes, M., Jackson, D. L., Unruh, D., Wang, H., Hobbins, M., Ogden, F. L., et al. (2024). Evaluation of retrospective National Water Model Soil moisture and streamflow for drought-monitoring applications*. Journal of Geophysical Research: Atmospheres,* 129, e2023JD038522. https://doi.org/10.1029/2023JD038522

Schmitt, J., Tseng, K.-C., Hughes, M., & Johnson, N. C. (2024). Illuminating snow droughts: The future of western United States snowpack in the SPEAR large ensemble. *Journal of Geophysical Research: Atmospheres*, 129, e2023JD039754. https://doi.org/10.1029/2023JD039754

de Boer, G, White A, Cifelli R, Intrieri J, **Abel M.R.**, et. al., 2023: Supporting Advancement in Weather and Water Prediction in the Upper Colorado River Basin: The SPLASH Campaign. *Bull. Amer. Meteor. Soc*., 104, E1853–E1874, https://doi.org/10.1175/BAMS-D-22-0147.1 .

Abel M.R., Swales D, Scott JD, Alexander M, Mahoney K, McCrary RR, Cifelli, R, and Bukovsky M (2022) Changes in extreme Integrated water Vapor Transport (IVT) on the U.S. west coast in NA-CORDEX, and relationship to mountain and inland extreme precipitation, *Clim Dyn*. 59, 973–995. https://doi.org/10.1007/s00382-022-06168-6

Sthapit, E., Lakhankar, T., **Hughes, M.,** Khanbilvardi, R., Cifelli, R., Mahoney, K., ... & Rafieeinasab, A. (2022). Evaluation of Snow and Streamflows Using Noah-MP and WRF-Hydro Models in Aroostook River Basin, Maine. *Water*, 14(14), 2145. https://doi.org/10.3390/w14142145

Bytheway, J. L., **Abel M.R.,** Mahoney K, Cifelli, R and JM English, (2022): Demonstrating a probabilistic quantitative precipitation estimate for evaluating precipitation forecasts in complex terrain. Wea. Forecasting, 37, 45-64, https://doi.org/10.1175/WAF-D-21-0074.1 .

McCrary, R. R., Mearns, L. O., **Abel, M.R.,** Biner, S., & Bukovsky, M. S. (2022). Projections of North American snow from NA-CORDEX and their uncertainties, with a focus on model resolution. Climatic Change, 170(3-4), 20. https://doi.org/10.1007/s10584-021-03294-8

Mahoney K, Scott JD, Alexander M, McCrary R, **Abel M.R.**, Swales D, and Bukovsky M (2021) Cool season precipitation projections for California and the Western United States in NA-CORDEX models. *Clim Dyn* https://doi.org/10.1007/s00382-021-05632-z

Wang, H., Xu, L., **Hughes, M.,** Chelliah, M., DeWitt, D. G., Fuchs, B. A., & Jackson, D. L. (2021). Potential caveats in land surface model evaluations using the US drought monitor: roles of base periods and drought indicators. *Environmental Research Letters*, 17(1), 014011. https://doi.org/10.1088/1748-9326/ac3f63

Pflug, J. M., **Hughes, M.,** & Lundquist, J. D. (2021). Downscaling snow deposition using historic snow depth patterns: Diagnosing limitations from snowfall biases, winter snow losses, and interannual snow pattern repeatability. *Water Resources Research*, 57(8), https://doi.org/10.1029/2021WR029999 .

Abel M.R., Lundquist, J, and Henn, B (2020) Dynamical downscaling improves upon gridded precipitation products in the Sierra Nevada, California. *Clim Dyn,* **55**, 111–129 (2020). https://doi.org/10.1007/s00382-017-3631-z

Solomon, A, Intrieri, J, Persson O, Cox C, de Boer G, **Hughes M**, Capotondi A (2020) Description and Evaluation of the NOAA Coupled Arctic Forecast System (CAFS). NOAA Technical memorandum. https://doi.org/10.25923/v7vj-z744

Hurwitz, MM, Baxter, S, Brown, B, Carman, J, Dale, J, Draper, C, Horsfall, F, **Abel, M.R.**, Gerth, J, Kapnick, S, Olheiser, C, Olsen, M, Stachelski, C, Vincent, M, Webb, RS, & Zdrojewski, J (2020). Six Priorities for Investment in Snow Research and Product Development, *Bulletin of the American Meteorological Society*, 101(11), E2025-E2029. https://doi.org/10.1175/BAMS-D-20-0218.1

Viterbo F, Read L, Nowak K, Wood AW, Gochis D, Cifelli R, **Hughes M** (2020) General Assessment of the Operational Utility of National Water Model Reservoir Inflows for the Bureau of Reclamation Facilities. *Water* 2020, *12*, 2897. https://doi.org/10.3390/w12102897

Bytheway JL, **Abel M.R.,** Mahoney K, and Cifelli R (2020) On the uncertainty of high resolution hourly quantitative precipitation estimates in California. *J. Hydrometeor*., 21, 865-879, https://doi.org/10.1175/JHM-D-19-0160.1 .

Van Abel K. Back, A, Brennan, MK, Chegwidden, OS, **Hughes M,** Pinheiro, M, Bitz, CM (2020) Exploring the Application of Machine Learning for Downscaling Climate Projections. In: Lee M., Najera Chesler A. (eds) Research in Mathematics and Public Policy. Association for Women in Mathematics Series, vol 23. Springer, Cham. https://doi.org/10.1007/978-3-030-58748-2_1

Lundquist, J., **M.R. Abel**, E. Gutmann, and S. Kapnick (2019): Our skill in modeling mountain rain and snow is bypassing the skill of our observational networks. Bull. Amer. Meteor. Soc., 0, https://doi.org/10.1175/BAMS-D-19-0001.1

Bytheway, J.L., **M.R. Abel**, K. Mahoney, and R. Cifelli (2019): A Multiscale Evaluation of Multisensor Quantitative Precipitation Estimates in the Russian River Basin. J. Hydrometeor., 20, 447–466, https://doi.org/10.1175/JHM-D-18-0142.1

Mahoney K, Swales D, Mueller M, Alexander M, **Abel M.R.**, Malloy K (2018) An examination of an inland-penetrating atmospheric river flood event under potential future thermodynamic conditions. *J. Clim.,* 31, 6281–6297, https://doi.org/10.1175/JCLI-D-18-0118.1

Mueller MJ, Mahoney KM, and **Abel M.R.** (2017) High-Resolution Model-Based Investigation of Moisture Transport into the Pacific Northwest during a Strong Atmospheric River Event, *Monthly Weather Review,* 145:9, 3861-3879. https://doi.org/10.1175/MWR-D-16-0466.1

Lapo, K. E., L. M. Hinkelman, E. Sumargo, **M. Hughes**, and J. D. Lundquist (2017), A critical evaluation of modeled solar irradiance over California for hydrologic and land surface modeling, *J. Geophys. Res. Atmos*., 121, https://doi.org/10.1002/2016JD025527 .

Cassano JJ, DuVivier A, Roberts A, **Abel M.R.**, Seefeldt M, Brunke M, Craig A, Fisel B, Gutowski W, Hamman J, Higgins M, Maslowski W, Nijssen B, Osinski R, Zeng X (2017) Development of the Regional Arctic System Model (RASM): Near-surface atmospheric climate sensitivity, *J. Clim.*, 30:15, 5729-5753. https://doi.org/10.1175/JCLI-D-15-0775.1

Jackson D, **Hughes M**, Wick G (2016) Evaluation of Landfalling Atmospheric Rivers along the U.S. West Coast in Reanalysis Data Sets, *JGR-Atmospheres*, 121, 2705–2718, https://doi.org/10.1002/2015JD024412 .

Ralph FM, Cordeira JM, Neiman PJ, **Abel M.R.** (2016) Landfalling Atmospheric Rivers, the Sierra Barrier Jet, and Extreme Daily Precipitation in Northern California's Upper Sacramento River Watershed, *J. Hydromet.*, **17**, 1905–1914, https://doi.org/10.1175/JHM-D-15-0167.1

Mahoney KM, Jackson D, Neiman P, **Abel M.R.**, Darby L, Wick GA, White A, Sukovich E, Cifelli R (2016) Understanding the role of atmospheric rivers in heavy precipitation in the southeastern US, *Mon. Wea. Rev.*, 2016 144:4, 1617-1632. https://doi.org/10.1175/MWR-D-15-0279.1

Henn, B., M. P. Clark, D. Kavetski, A. J. Newman, **M. Hughes,** B. McGurk, and J. D. Lundquist (2016), Spatiotemporal patterns of precipitation inferred from streamflow observations across the Sierra Nevada mountain range. *J. of Hydrology* https://doi.org/10.1016/j.jhydrol.2016.08.009 .

Swales, D., M. Alexander, and **M. Hughes** (2016), Examining moisture pathways and extreme precipitation in the U.S. Intermountain West using self-organizing maps, Geophys. Res. Lett., 43, 1727–1735, https://doi.org/10.1002/2015GL067478

Hamman, J., B. Nijssen, M. Brunke, J. Cassano, A. Craig, A. DuVivier, **M.R. Abel**, D. Lettenmaier, W. Maslowski, R. Osinski, A. Roberts, and X. Zeng, 2016: Land Surface Climate in the Regional Arctic System Model. *J. Climate*, 29, 6543–6562, https://doi.org/10.1175/JCLI-D-15-0415.1 .

Hughes M, Cassano JJ (2015) The climatological distribution of extreme Arctic winds, and implications for ocean and sea ice processes. *JGR-Atmospheres,* 120, 7358–7377. https://doi.org/10.1002/2015JD023189 .

Lundquist J, **Abel M.R.**, Henn B; Gutmann, ED; Livneh, B; Dozier, J; Neiman P (2015) High-elevation precipitation patterns: using snow measurements to assess daily gridded datasets across the Sierra Nevada, California, *J. Hydromet.,* 16, 1773–1792. DOI http://dx.doi.org/10.1175/JHM-D-15-0019.1

Abel M.R., Mahoney K, Neiman P, Moore BJ, Alexander M, Ralph FM (2014) The Landfall and Inland Penetration of a Flood-Producing Atmospheric River in Arizona. Part II: Sensitivity of modeled precipitation to terrain height and atmospheric river orientation. *J. Hydromet.,* 15, 1954–1974. https://doi.org/10.1175/JHM-D-13-0176.1

Alexander M, Scott JD, Swales D, **Abel M.R.**, Mahoney K, Smith CA (2014) Moisture Pathways into the U.S. Intermountain West Associated with Heavy Winter Precipitation Events. *J. Hydrometeor*, 16, 1184–1206. DOI: https://doi.org/10.1175/JHM-D-14-0139.1

Roberts A, Cassano J, DuVivier A, **Hughes M**, Maslowski W, Osinski R, Craig A, and Nijssen B (2014) Simulating transient ice-ocean Ekman transport in the Regional Arctic System Model and Community Earth System Model, *Ann. Glaciol*. (2014). https://doi.org/10.3189/2015AoG69A760

Neiman P, **Abel M.R.**, Moore BJ, Ralph FM, Sukovich E (2013) Sierra Barrier Jets, Atmospheric Rivers, and Precipitation Characteristics in Northern California: A Composite Perspective Based on a Network of Wind Profilers, *Mon. Wea. Rev*., 141, 4211–4233. https://doi.org/10.1175/MWR-D-13-00112.1

Kingsmill DE, Neiman PJ, Moore BJ, **Abel M.R.**, Yuter SE, Ralph FM (2013) Kinematic and thermodynamic structures of Sierra barrier jets and overrunning atmospheric rivers during a land-falling winter storm in northern California. *Mon. Wea. Rev. 141, 2015–2036*. https://doi.org/10.1175/MWR-D-12-00277.1

Capps SB, Hall A, **Hughes M** (2013) Sensitivity of Southern California wind energy to turbine characteristics. *Wind Energ.*, 17: 141–159. https://doi.org/10.1002/we.1570

Wayand N, Lundquist J, Hamlet A, **Abel M.R.**, Feld S (2013) Intercomparison of Meteorological Forcing Data from Empirical and Mesoscale Model Sources in the N.F. American River Basin in northern Sierra Nevada, California, *J. Hydromet.,* **14**, 677–699. https://doi.org/10.1175/JHM-D-12-0102.1

Neiman P, Ralph FM, Moore BJ, **Abel M.R.**, Mahoney K, Cordeira JM, Dettinger M (2013) The Landfall and Inland Penetration of a Flood-Producing Atmospheric River in Arizona. Part I: Observed Synoptic-Scale, Orographic, and Hydrometeorological Characteristics, *J. Hydrometeor.*, **14**, 460-484. https://doi.org/10.1175/JHM-D-12-0101.1

Hughes M, Neiman PJ, Sukovich E, and Ralph FM (2012) Representation of the Sierra Barrier Jet in 11 years of a high-resolution dynamical reanalysis downscaling compared with long-term wind profiler observations, *JGR-Atmospheres*, 117, https://doi.org/10.1029/2012JD017869 .

Berg N, Hall A, Capps SB, **Abel M.R.** (2012) El Niño-Southern Oscillation Impacts on Winter Winds over Southern California, *Clim. Dyn.*, 40:1-2, pp 109-121. https://doi.org/10.1007/s00382-012-1461-6

Dettinger MD, Ralph FM, **Hughes M**, Das T, Neiman P, Cox D, Estes G, Reynolds D, Hartman R, Cayan D, Jones L (2012) Design and quantification of an extreme winter storm scenario for emergency preparedness and planning exercises in California. *Natural Hazards*. https://doi.org/10.1007/s11069-011-9894-5

Gershunov A, Rajagopalan B, Overpeck J, Guirguis K, Cayan D, **Hughes M**, Dettinger M, Castro C, Schwartz R, Anderson M, Ray A, Barsugli J, Cavazos T, Alexander M (2012) The Southwest Weather and Climate Extremes of the Future, Chapter 7, in: *Assessment of Climate Change in the Southwest United States: a Technical Report Prepared for the U.S. National Climate Assessment.* A report by the Southwest Climate Alliance [Gregg Garfin, Angela Jardine, Robert Merideth, Mary Black, and Jonathan Overpeck (eds.)]. Tucson, AZ: Southwest Climate Alliance.

Dong C, McWilliams J, Hall A, **Hughes M** (2011) Numerical Simulation of a Synoptic Event in the Southern California Bight, J. Geophys. Res., 116, C05018, https://doi.org/10.1029/2010JC006578 .

Neiman PJ, Schick LJ, Ralph FM, **Abel M.R.**, Wick GA (2011) Flooding in Western Washington: The connection to atmospheric rivers. *J. of Hydrometeorology.* 12:6, 1337-1358. https://doi.org/10.1175/2011JHM1358.1

Porter, K., A. Wein, ... **M. Hughes**, ... P. J. Neiman, ... F. M. Ralph, et al. (2011): Overview of the ArkStorm Scenario, U.S. Geological Survey Open-File Report, 2010-1312, 183 p. and appendixes.

Hughes M, Hall A, and Kim, J (2011) Human-induced changes in wind, temperature and relative humidity during Santa Ana events. *Clim. Change*. 109 (S1), 119-132. https://doi.org/10.1007/s10584-011-0300-9

Moritz MA, Moody TJ, Krawchuk MA, **Hughes M**, and Hall A (2010), Spatial variation in extreme winds predicts large wildfire locations in chaparral ecosystems, *Geophys. Res. Lett.*, 37, L04801, https://doi.org/10.1029/2009GL041735 .

Neiman PJ, Sukovich EM, Ralph FM, **Abel M.R.** (2010) A Seven-Year Wind Profiler–Based Climatology of the Windward Barrier Jet along California's Northern Sierra Nevada. *Mon. Wea. Rev.*, 138, 1206-1233. https://doi.org/10.1175/2009MWR3170.1

Hughes M and Hall A (2010) Local and synoptic mechanisms causing Southern California's Santa Ana winds, *Clim. Dyn*. 34:847-857 https://doi.org/10.1007/s00382-009-0650-4 .

Hughes M, Hall A, and Kim, J (2009) Anthropogenic Reduction of Santa Ana winds, California Environmental Protection Agency and California Energy Commission Report CEC-500-2009-030-F.

Abel M.R., Hall A, Fovell, RG (2009) Blocking in areas of complex topography and its influence on rainfall distribution, *J. Atmos. Sci*., 66:508-518, https://doi.org/10.1175/2008JAS2689.1 .

Hughes M, Hall A, Fovell RG (2007) Dynamical controls on the diurnal cycle of temperature in complex topography. *Clim. Dyn.* 29:277–292. https://doi.org/10.1007/s00382-007-0239-8

SELECT LEAD AUTHOR CONFERENCE PRESENTATIONS, SEMINARS, AND PANELS

Abel MR, et al. Characterizing Orographic Precipitation from Weak Atmospheric Rivers across the Sierra Nevada in Historical Data, AGU annual meeting (poster), Dec 2024

Towler, Abel M.R. (presenting author), et al. Enhancing subseasonal to seasonal ensemble streamflow predictions using postprocessed precipitation forecasts to inform resampling, NOAA S2S Applications Workshop, Sept 2024

Hughes et al.: Improving NOAA's water tools through physically motivated, data-driven, and hybrid modeling techniques (poster), CIROH developers conference, May 2024

Hughes: Too much and too little water: Using hydrometeorological modeling to characterize and understand water extremes, Goddard Earth Sciences Technology and Research (GESTARII) 2024 seminar series, May 2024 ***(Invited)***

Hughes et al.: Improving NOAA's water tools through physically motivated, data-driven, and hybrid modeling techniques, AMS annual meeting, hydrology conference, Jan 2024

Hughes et al.: Improving NOAA's water tools through physically motivated, data-driven, and hybrid modeling techniques, AMS student conference hydrometeorology panelist, Jan 2024 ***(Invited)***

Hughes et al.: Improving NOAA's water tools through physically motivated, data-driven, and hybrid modeling techniques. Colorado River Basin Hydrology and Climate Working Group meeting, November 2023 ***(Invited)***

Hughes: panelist on the 'Data user' group for workshop on 'Understanding Decision-Relevant Regional Climate Projections' in Berkeley, CA, Nov 2023 ***(Invited)***

Hughes: Atmospheric Rivers and climate change: the settled, the unsettled, and the unsettling. NOAA West Watch webinar, June 2023 ***(Invited)***

Hughes et al.: How Sensitive are Projections of Cool Season Precipitation on the US West Coast to Microphysical Parameterization Choice? (poster) AGU annual meeting Dec 2022

Hughes M: Toward Useful and Usable Hydroclimate Projections that are Right for the Right Reasons, US Regional Hydroclimate Program meeting, March 2022 ***(Invited)***

Hughes M et al.; Evaluation of the National Water Model for Stakeholder Needs, NOAA General Modeling Meeting and Fair exhibit, April 2021

Hughes M, Swales D, McCrary RR, Gutmann E, Scott JD, Alexander M, and Mahoney K; Changes in Extreme IVT on the US West Coast in NA-CORDEX, and Relationship to Mountain and Inland Extreme Precipitation, AMS Mountain Meteorology, July 2020

Hughes M, Jackson D, Hobbins M, Cifelli R, Webb RS, D. Unruh, F. Salas, Glaudemans MJ, Ogden F, Meng J, Wang H, and D DeWitt; Application of the National Water Model for Drought Monitoring, (poster) AMS Mountain Meteorology, July 2020

Hughes M, Jackson D, Hobbins M, Cifelli R, Webb RS, D. Unruh, F. Salas, Glaudemans MJ, Ogden F, Meng J, Wang H, and D DeWitt; Application of the National Water Model for Drought Monitoring, NOAA Drought Task Force, May 2020 ***(Invited)***

Hughes M; Evaluation of the National Water Model for Stakeholder's Needs, NOAA Physical Sciences Laboratory Flash seminar, April 2020

Hughes M, Swales D, McCrary RR, Gutmann E, Scott JD, Alexander M, and Mahoney K; Changes in Extreme IVT on the US West Coast in NA-CORDEX, and Relationship to Mountain and Inland Extreme Precipitation, AMS Annual Meeting, Boston MA, Jan 2020

Hughes M, Swales D, McCrary RR, Gutmann E, Scott JD, Alexander M, and Mahoney K; Changes in Extreme IVT on the US West Coast in NA-CORDEX, and Relationship to Mountain and Inland Extreme Precipitation, International Conference on Alpine Meteorology, Riva del Garda, Italy, Sept 2019

Hughes M, Swales D, McCrary RR, Gutmann E, Scott JD, Alexander M, and Mahoney K; Future of IVT and Precipitation Projections Using Regional Climate Models, Sixth Annual Forecast Informed Reservoir Operations workshop, La Jolla, CA, August 2019 ***(invited)***

Hughes M, Swales D, McCrary RR, Gutmann E, Scott JD, Alexander M, and Mahoney K; Changes in Extreme IVT on the US West Coast in NA-CORDEX, and Relationship to Mountain and Inland Extreme Precipitation; (poster) California Extreme Precipitation Symposium, Davis, CA, June 2019

Hughes M, Persson O, Solomon A, Intrieri J; Low-level jets in the Autumnal Marginal Ice Zone: Sensitivity to sea ice extent and the influence of coupling on surface turbulent heat fluxes; (poster) WRF Users Workshop, June 2019

Hughes M, Persson O, Solomon A, Intrieri J; Low-level jets in the Autumnal Marginal Ice Zone: Sensitivity to sea ice extent and the influence of coupling on surface turbulent heat fluxes; (poster) AMS Polar Meteorology and Oceanography, June 2019

M Hughes, D L Jackson, R J Zamora, R Cifelli, M Hobbins, F Salas, K Sparrow, R S Webb, D DeWitt, P Colohan; Application of the National Water Model for Drought Monitoring, American Water Works Association, Sustainable Water Management Conference, Mar 2019 ***(invited)***

Hughes M, D L Jackson, R J Zamora, R Cifelli, M Hobbins, F Salas, K Sparrow, R S Webb, D DeWitt, P Colohan; Development of Prototype National Water Model Soil Moisture Products for Drought Monitoring, AGU Annual meeting, Washington DC, Dec 2018

Hughes M, Jackson D, Zamora R, Hobbins M, Cifelli R, Webb R, Colohan P, and DeWitt D; Development of Prototype National Water Model Soil Moisture Products for Drought Monitoring, NOAA General Modeling Meeting and Fair, College Park, MD, Sept 2018.

Hughes M, Jackson D, Zamora R, Hobbins M, Cifelli R, Webb R, Colohan P, and DeWitt D; Development of Prototype National Water Model Soil Moisture Products for Drought Monitoring, AMS Mountain Meteorology, Santa Fe, NM, June 2018.

Hughes M, Jackson D, Zamora R, Hobbins M, Cifelli R, Webb R, Colohan P, and DeWitt D; Development of Prototype National Water Model Soil Moisture Products for Drought Monitoring, MOISST 2018 workshop, Lincoln, NE, June 2018.

Hughes M; Too much and too little water: Using hydrometeorological modeling to characterize and understand water extremes, Department of Atmospheric Sciences, University of North Dakota, Grand Forks, ND, May 2018. ***(Invited)***

Hughes M, Jackson D, Zamora R, Hobbins M, Cifelli R, Webb R, Colohan P, and DeWitt D; Development of Prototype National Water Model Soil Moisture Products for Drought Monitoring, Climate Prediction Applications Science Workshop, Fargo, ND, May 2018.

Hughes M, Jackson D, Zamora R, Hobbins M, Cifelli R, Webb R, Colohan P, and DeWitt D; Development of Prototype National Water Model Products for Drought Monitoring, North American Drought Monitoring workshop, Calgary, Canada, May 2018.

Hughes M, Jackson D, Zamora R, Hobbins M, Cifelli R, Webb R, Colohan P, and DeWitt D; Development of Prototype National Water Model Soil Moisture Products for Drought Monitoring, AMS Annual Meeting, Austin, TX, Jan 2018.

Hughes M, Lundquist J, and Henn B; Dynamical downscaling improves upon gridded precipitation products in the Sierra Nevada, California, AMS Annual Meeting, Austin, TX, Jan 2018.

Hughes M, Persson O, Solomon A, Intrieri J; Low-level Jets in the Autumnal Marginal Ice Zone: Sensitivity to Ice-edge Forcings, AMS Mesoscale Meteorology Conference, San Diego, CA, July 2017.

Hughes M, Lundquist J, and Henn B; Dynamical downscaling improves upon gridded precipitation products in the Sierra Nevada, California, International Conference on Alpine Meteorology, Reykjavik, Iceland, June 2017.

Hughes M, Lundquist J, and Henn B; Dynamical downscaling overcomes deficiencies in gridded precipitation products in the Sierra Nevada, California, AGU 2016 fall meeting, San Francisco, CA. (poster) Presented by C. Williams.

Hughes M and coauthors, CIRES/NOAA ESRL progress on estimating wet weather extremes, CCAWWG Climate Change Science for Engineering Applications Workshop, Seattle, WA, August 25, 2015. ***(Invited)***

Hughes M, Cassano J, Roberts A, and Maslowski W; Sensitivity of Arctic climate to spectral nudging in the Regional Arctic System Model, IUGG 26th General Assembly, Prague, Czech Republic, June. 2015.

Hughes M and Cassano J; The climatological distribution of extreme Arctic winds, and implications for ocean and sea ice processes. CMOS and polar AMS, Whistler, BC, June 2015 (presented by J Cassano)

Hughes M and coauthors, Linkages between ARs and Orographic Precipitation in the Western U.S., NOAA ESRL PSD lab review, Boulder, CO, May 12, 2015.

Hughes M, Jackson D, Gutmann E, Wick GA; Objective identification of atmospheric rivers, and implications for extreme precipitation at the basin scale, AGU 2014 fall meeting, San Francisco, CA, Dec. 2014 ***(Invited)***

Hughes M, Cassano J, Roberts A, and Maslowski W., Sensitivity of Arctic climate to spectral nudging in the Regional Arctic System Model, AGU 2014 fall meeting, San Francisco, CA, Dec. 2014.

Hughes M, K. Mahoney, P. J. Neiman, B. J. Moore, M. Alexander, and F. M. Ralph Impacts of upstream terrain height and integrated water vapor transport angle on resultant precipitation during an inland-penetrating atmospheric river event, AMS Mountain Meteorology, San Diego, CA, Aug. 2014

*Hughes M, D Jackson, Gutmann E, and G Wick, Objective identification of atmospheric rivers, and implications for extreme precipitation at the basin scale, GEWEX 7th International Scientific Conference, The Hague, Netherlands, July 2014 *(Awarded outstanding early career scientist presentation)

Hughes M, Exploring climate extremes in complex terrain: Applications of dynamical downscaling, Institute of Arctic and Alpine Research, University of Colorado, Boulder, CO Jan 2014 **(*Invited*)**

Hughes M, Dynamical downscaling and orographic precipitation: Understanding climatological precipitation in mountainous terrain, Department of Earth & Atmospheric Sciences, University of Northern Colorado, Greeley, CO Sept 2013 **(*Invited*)**

Hughes M and Cassano JJ, The climatological distribution of extreme Arctic winds, and implications for ocean and sea ice processes, 12th AMS Polar Meteorology and Oceanography, Seattle, WA, April 2013

Hughes, M, Sukovich E, Neiman P, and FM Ralph, Representation of the Sierra Barrier Jet in 11 years of a high-resolution dynamical reanalysis downscaling, 15th AMS Mountain Meteorology, Steamboat Springs, CO August 2012

Hughes, M, Mahoney K, Neiman P, Ralph F, Moore B, and Dettinger M, The Landfall and Inland Penetration of a Flood-Producing Atmospheric River in Arizona. Part 2: Impacts of WRF Resolution on water vapor transports and precipitation, 15th AMS Mountain Meteorology, Steamboat Springs, CO August 2012

Hughes, M. Understanding climate processes in complex terrain: Applications of dynamical downscaling, ASP Summer Colloquium on the Weather-Climate Intersection, Boulder, CO, June 2012 ***(Invited)***

Hughes, M, Sukovich E, Neiman P, and FM Ralph, Representation of the Sierra Barrier Jet in 11 years of a high-resolution dynamical reanalysis downscaling, American Geophysical Union annual meeting, San Francisco, CA, Dec. 2011

*Hughes, M, Cayan D, and Hall A, Low-frequency variability of and impact of climate change on Southern California's Santa Ana winds, WCRP Climate Research in Service to Society, Denver, CO, Oct. 2011 *(Awarded Outstanding early career Poster Presentation)

Hughes, M, Hall, A, and Kim, J, Local and synoptic mechanisms controlling Southern California's Santa Ana winds, and implications in a changing climate. Scripps Institution of Oceanography, Climate Atmospheric Science and Physical Oceanography, April 2011 ***(Invited)***

Hughes, M, Hall, A, and Kim, J, Local and synoptic mechanisms controlling Southern California's Santa Ana winds, and implications in a changing climate. NOAA ESRL Physical Sciences Division seminar, Boulder, CO, March 2011 ***(Invited)***

Hughes, M, Sukovich E, Neiman P, Sierra Barrier Jets that occur simultaneously with atmospheric river events in a high-resolution dynamical downscaling of the North American Regional Reanalysis, American Geophysical Union annual meeting, San Francisco, CA, Dec. 2010

Hughes, M, Sukovich E, Neiman P, and Ralph FM, North-south variability of the Sierra Barrier Jet, and its downscaling representation. CalWater Annual meeting, La Jolla, CA, October 2010.

Hughes, M, Cayan D, Hall A, Kim J, Ralph FM, Human-induced changes in wind, temperature, and relative humidity during Santa Ana wind events. Boulder Laboratories Postdoctoral Poster Symposium, Boulder, CO, June 2010.

Hughes, M, Hall, A, and Kim, J, Anthropogenic Reduction of Santa Ana winds, American Geophysical Union annual meeting, San Francisco, CA, Dec. 2008

Hughes, M, Hall, A, and Kim, J, Anthropogenic Reduction of Santa Ana winds, Fifth Annual Climate Change Research Conference, Sacramento, CA, Sept. 2008

Hughes, M, Mesoscale dynamics of Southern California's climate, National Weather Service, Oxnard office, Oxnard, CA June 2008

Hughes, M, Hall, A, and Fovell, RG, On the distribution of rainfall in complex topography, 12th AMS Conference on Mesoscale Processes, Waterville Valley, NH, August 2007

Hughes, M, Hall, A, and Fovell, RG, Blocking in areas of complex topography, and its influence on rainfall distribution, Mesoscale and Microscale Meteorology division of the National Center for Atmospheric Research, Boulder, CO, June 2007

Hughes, M, Hall, A, and Fovell, RG, Links between diurnal cycles of temperature and wind in complex topography, 22nd Pacific Climate (PACLIM) Workshop, Pacific Grove, CA, March 2006

Hughes, M, and Hall, A, The origins of Southern California's climate diversity, 85th Annual AMS general meeting, San Diego, CA, January 2005

Hughes, M, and Hall, A, Small scale variations in the diurnal amplitude of surface air temperature in Southern California, AGU Fall meeting, San Francisco, CA, 2004

FELLOWSHIPS AND AWARDS

NOAA Employee of the Month in July 2024.

AMS Reviewer award 2023, *'For sustained excellence as a reviewer'* for Journal of Hydrometeorology.

AGU Reviewer award 2022, for reviews in *Geophysical Research Letters*

AMS Mountain Meteorology 2021 Outstanding Service Award, *'For service to the mountain Meteorology community, especially through organization of high-quality and inclusive conferences'*

NOAA Bronze Medal Team Award "*For the development of a fully coupled, ocean-ice-atmosphere model that delivers daily, 0-10 day, sea ice forecast guidance to the NWS Alaska Region.*" 2021

CIRES Outstanding Performance Award, service category, for leadership and development of the CIRES Mentoring Program, May 2020. Since I became a NOAA Federal employee before this award was presented, I received a federal time off award rather than the monetary CIRES award.

Outstanding Early Career Scientist Presentation Award at GEWEX 7th International Scientific Conference, July 2014

Travel grant to GEWEX 7th International Science Conference at The Hague, July 2014.

Outstanding Poster Presentation Award at WCRP Open Science Conference, Oct. 2011

National Research Council Postdoctoral Research Associateship, 2008-2010

Bjerknes Memorial Award "for research involving the understanding of climate dynamics at the regional scale", Dept of Atmos. & Ocean. Sci., UCLA, Fall 2007.

Dissertation year fellowship, UCLA, 2007-2008

Regents stipend, UCLA, 2006-2007

Brian Lance Bosart Award, "for unselfish service to fellow students and positive contribution to department life while demonstrating a firm commitment to academics". Department of Atmospheric and Oceanic Sciences, UCLA, Fall 2005.

National Science Foundation Graduate Research Fellowship, 2003-2006

Eugene V. Cota-Robles Fellowship, UCLA, 2002-2003

IGPP UCLA Fellowship, 2002-2003

McNair Scholar, 2001-2002

Schreyer Honor's College scholarship, 1997-2001

FUNDED PROPOSALS

M Wright (PI); Key people: K Mahoney, **M Hughes**, M Alexander, R Cifelli, D Swales, E Gutmann, 2020-2023: Simulating California's water supply system under future climate stresses, USBR S&T proposal, $299,187

Reeves, H; **M Hughes;** D Gochis; 2018-2020: Use of MRMS-derived hydrometeor classification for determining initial hydrometeor phase in the National Water Model, NOAA OWAQ, $449,678

M Wright (PI); Key people: K Mahoney, **M Hughes**, M Alexander, R Cifelli, J Scott, 2018-2020: Assessing potential future changes in atmospheric rivers over the western coast of the U.S., USBR S&T proposal, $203,702

K Nowak (PI); Key people: R Cifelli, L Johnson, **M Hughes**, D Gochis, K Dahm, 2017-2020: National Water Model Assessment for Reclamation's water management needs, USBR S&T proposal, $488,260

J Lundquist (PI), C Chickadel, N Cristea, and **M Hughes** (Co-Investigator), 2014-2017: Sensing and Simulation Spatial Snow and Streamflow in the Sierra, NASA Terrestrial Hydrology. CU sub-contract: $27,428.

J Lundquist and **M Hughes**, 2014-2017: Collaborative Research: Unraveling Orographic Precipitation Patterns by Combined Hydrologic and Atmospheric Analysis, NSF, Hydrological Sciences Program. CU portion: $96,203 ($342,606 total award).

M Hughes, 2013-2015: Characterization of Atmospheric River events within Reanalysis Products and their Impact on Extreme Precipitation in the Western United States. National Oceanic and Atmospheric Administration, Climate Program Office. $234,166.

W Maslowski, A Roberts, J Clement Kinney, JJ Cassano, and **M Hughes**, 2012-2016: Physically consistent eddy-resolving state estimation and prediction of the coupled pan-Arctic climate system at daily to interannual time scales using the Regional Arctic Climate Model (RACM). Office of Naval Research, Arctic and Global Prediction Program, CU portion: $142,012.

M Hughes, 2008-2010: Connections between atmospheric rivers, orographic precipitation, and climate variability. National Research Council Research Applications Program Postdoctoral Fellowship, $92,000.

M Hughes (as M Abel), 2003-2006: Verification of satellite data with a Rayleigh LIDAR system. National Science Foundation Graduate Research Fellowship. $75,000

PROFESSIONAL SERVICES, TRAININGS, AND OUTREACH ACTIVITIES

Editor for Journal of Hydrometeorology (Feb. 2024-present)
Co-chair of Mountain Hydroclimate Working Group of H2US: Humans and Hydroclimate in the United States, an initiating GEWEX Regional Hydroclimate Program (Oct 2022-present)
Board of Directors (Secretary) for Earth Science Women's Network (June 2024-Dec 2024)
Participant, NOAA Mid-Career Leadership Development Program (June 2023-April 2024)
Co-chair of Mentorship for Earth Science Women's Network (June 2021-June 2024)
Panelist for 'Their Career, Their Stories' AMS Hydrology Committee webinar, April 2021
Member of the NOAA Water Initiative Research and Development Team (2020-2021)
Participant in ESWN and NOAA Leadership Workshop, August 2019
Co-chair and Moderator for 'Panel discussion on Inclusiveness', AMS Mountain Meteorology, July 2020
'Clouds in a bottle' presented at Sheridan Green elementary school, Feb 2020
Co-Founder of CIRES mentoring program
CIRES mentoring committee chair (Oct 2018 to Aug 2019)
Participant in Women in Mathematics and Public Policy workshop at the Institute for Pure and Applied Mathematics, UCLA, Jan 2019
Associate Editor of Journal of Hydrometeorology (March 2018-Feb 2024)
Co-chair of AMS Mountain Meteorology 2018 meeting
WRF-Hydro Training, Sept 2017
Fiscal year 2016 Colorado Leadership and Development Program
Science co-lead for 'changes in wet-weather extremes' at 2015 CCAWWG Climate Change Science for Engineering Applications Workshop, August 2015
Member of CIRES Member's Council (July 2015-June 2019, **Chair in FY 2017**)
Participant, American Meteorological Society Summer Policy Colloquium, June 2015

CIRES outstanding performance award review committee member (2015-2017, **Chair in 2017**)

AMS Mountain Meteorology committee member (2016-2021)

NSF steering committee for connecting atmospheric and hydrological processes (2013-2014)

Reviewer for: Nature Climate Change, Nature Geoscience, Quarterly Journal of the Royal Meteorological Society, Journal of Applied Meteorology and Climatology, Geophysical Research Letters, International Journal of Biometeorology, Journal of the Atmospheric Sciences, Journal of Hydrometeorology, Hydrology (MDPI), Journal of Atmospheric and Oceanic Technology, Journal of Advances in Modeling Earth Systems, Monthly Weather Review, International Journal of Wildland Fire, Weather and Forecasting, Climate Dynamics, Journal of Geophysical Research – Atmospheres, Water Resources Research, Hydrology and Earth Systems Science, and proposal reviewer for NSF Atmospheric and Geospace Sciences, NASA NIP, and NASA MUREP

Member of the Workplace Advisory Committee in NOAA ESRL's Physical Sciences Division (2010-2015)

Chair of the Parent Appreciation Committee at Commerce Children's Center (2012-2015 and 2019-2021)

Served as a judge for Campbell Elementary School's annual science fair (held every March) in 2013, 2014, and 2015

UCLA Chi Epsilon Pi -- Faculty Representative (2003-2007)

Member of AMS and AGU since 2002