

Keith N. Musselman, Ph.D.

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EDUCATION	University of California Los Angeles	Los Angeles, California
	<i>Doctor of Philosophy in Civil Engineering</i>	2012
	<ul style="list-style-type: none">• Minor in Atmospheric Sciences• Emphasis in Hydrology & Water Resources• NASA Earth System Science Fellowship Recipient	
	University of Arizona	Tucson, Arizona
	<i>Master of Science in Hydrology & Water Resources</i>	2006
	<ul style="list-style-type: none">• Emphasis in Surface Hydrology	
	University of Vermont	Burlington, Vermont
	<i>Bachelor of Science in Geology</i>	2003
	<ul style="list-style-type: none">• Emphasis in Surface Hydrology	

PROFESSIONAL EXPERIENCE

Jan. 2023-Present: Assistant Professor, Dept. of Geography, University of Colorado - Boulder
2023 - Present: Faculty of Hydrologic Sciences Program, University of Colorado - Boulder.
2021 - 2023 : Research Assistant Professor, Fellow, Institute of Arctic & Alpine Research, University of Colorado - Boulder.
2017 - 2021 : Research Associate, Institute of Arctic & Alpine Research, University of Colorado - Boulder.
2015 - 2017 : Postdoctoral Fellow, National Center for Atmospheric Research, Advanced Study Program
2012 - 2015 : Postdoctoral Fellow, University of Saskatchewan
2008 – 2012 : NASA Earth System Science Graduate Fellow, University of California Los Angeles

AWARDS

RECEIVED	Outstanding Mentor Award	
	<i>Undergraduate Research Opportunities Program</i>	2021
	<i>University of Colorado, Boulder</i>	
	Best Presentation	
	<i>Western Snow Conference Annual Meeting, Reno, NV</i>	2019
	Best Student Poster Presentation	
	<i>Eastern Snow Conference Annual Meeting, Montreal, Quebec</i>	2010
	Graduate College Fellowship Award (merit-based)	
	<i>University of Arizona</i>	2005 and 2006
	David Hawley Undergraduate Research Scholarship	
	<i>University of Vermont</i>	2003

FUNDING

Funded | Pending Projects as Lead PI - \$7.6M Total, \$4.8M to Musselman at CU

- **NSF, Collaborations in Artificial Intelligence and Geosciences (Pending)** 2025-2028
“Collaborative Research: CAIG: Transforming Exploration of Large Earth System Science Datasets for End-Users through AI-Infused Workflows” (CU: \$322,641; \$1.24M total)
- **NASA, Terrestrial Hydrology Program, Conference Proposal** 2024
NASA Snow Community Meeting (CU: \$26k Total \$75k)
- **National Park Service, CESU supplemental funding** 2025-2027
“Alaska Glacier Status and Trends 2.0; Hydrologic Modeling” (\$178k)
- **NSF, Growing Convergence Research, supplemental funding** 2024-2029
Supplemental funding of ongoing project (CU: \$200k; \$300k total)
- **NSF, Navigating the New Arctic Program, supplemental funding** 2023-2028
Supplemental funding of ongoing project (CU: \$346k; \$600k total)
- **National Park Service, CESU supplemental funding** 2023-2026
“Alaska Glacier Status and Trends 2.0; Hydrologic Modeling” (\$25k)
- **NSF, Hydrological Sciences** 2022-2025
“Estimating the time of emergence of the anthropogenic warming signal in snow water resource metrics for western US headwaters” (CU: \$350k; Total: \$700k)
- **NSF, Growing Convergence Research** 2021-2026
“Collaborative Research: GCR: Co-defining climate refugia to inform the management of mountain headwater systems” (CU: \$854k Total: \$1.2M)
- **CU Boulder, Office of Outreach & Engagement** 2021-2022
Microgrant – “Facilitating Co-production and Indigenous Community Engagement” (\$1K)
- **NSF, Navigating the New Arctic Program, supplemental funding** 2021
Supplemental – Research Experience for Undergraduates (REU) (\$9K)
- **National Park Service, CESU** 2021-2023
“Alaska Glacier Status and Trends 2.0; Hydrologic Modeling” (\$67K)
- **NOAA, Climate Program Office** 2019-2023
“Assessing the predictability and probability of 21st century rain-on-snow flood risk for the conterminous U.S.” (\$200K)
- **NSF, Navigating the New Arctic Program** 2020-2024
“The climate impacts on Alaskan and Yukon rivers, fish, and communities as told through co-produced scenarios” (CU: \$2.2M; \$3M total)

Funded Projects as Co-PI or Senior Personnel - \$1.6M Total, \$1.0M to Musselman at CU

- **NASA, Terrestrial Hydrology Program, Conference Proposal** 2024
(CU PI, CU: \$26k Total \$75k)
- **New Zealand Endeavor Fund, NIWA, “Better runoff and hazard predictions through national-scale snowmelt forecasting” (International Advisor, CU: \$4.5k)** 2023-2026
- **NASA, Water Resources** 2022-2025
“Advancing domestic and international water management capabilities with a global daily snow cover and albedo product” (co-PI, CU: \$777k Total \$1.3M)

- **NASA, Applied Sciences** 2021-2022
“Satellite-based Snowpack Information: COVID-19 impacts on water resources” (**co-PI, \$21K**)
- **NASA, GEO, supplemental funding** 2019
“Optimizing the Indus Basin Irrigation System and reservoir operations using remotely sensed snow surface properties in the ParBal model” (**co-PI, \$22K**)
- **NSF, Hydrologic Sciences** 2018-2020
“Extending the vadose zone: characterizing the role of snow for liquid water storage and transmission in streamflow generation” (**co-PI, \$142K**)
- **University of Colorado Outreach Award** 2019-2020
“Past, Present, Future: Exploring Boulder’s Natural Environment” (**co-PI, \$24K**)

Doctoral and Post-Doctoral Fellowships

- **NCAR Advanced Study Program Fellowship** 2015-2017
“Slower snowmelt in a warmer world” (**\$136K**)
- **NASA Earth and Space Science Fellowship Program** 2008-2012
“Remote Sensing and Ground Data Assimilation Using A Basin-Scale Snow Water Equivalent Reconstruction Method” (**\$90K**)

Notable Recent Declined Proposals

- **NSF, Science and Technology Center, Pre-Proposal** 2026-2031
“Resilience Against Compound Hazards (REACH)” (role: **Senior Personnel**)
- **NASA, Earth System Explorer (Snow Satellite Mission)** 2024-2035
“SnoWatch: A signal of opportunity synthetic aperture radar satellite constellation to monitor global snow water equivalent at high resolution” (role: **Senior Personnel, CU PI \$1.23M; Total \$310M**)
- **Bureau of Reclamation, Science and Technology** 2023
“Assessing historical and projected future flood mechanisms for headwater basins of the western U.S.” (role: **PI, \$200k**)

REFEREED PUBLICATIONS 43+ Peer-reviewed Publications

Web of Science h-index = 23; Total citations = 2,428; Average citation per publication = 56

Google Scholar h-index = 28; Total citations = 3,504; Average citation per publication = 81

For publications after 2017:

¹Indicates student author in Musselman group

²Indicates other student or post-doctoral author

In Review | In Press

Cheng, Y., A.J. Newman, N. Herman-Mercer, D. Blaskey¹, P. Thomas², and **K.N. Musselman**. Towards co-designed numerical modeling: Reflecting end-user priorities. In Review, AGU Advances.

Hale, K., J. Meyer, J. Tarricone, C. Vuyovich, M. Mason, H.P. Marshall, **K.N. Musselman**, N.P. Molotch, R. Shah, S. Oveisgharan. What’s Next For Snow: Insights from the NASA Terrestrial Hydrology Program Community Snow Meeting. In Review, Earth’s Future.

Blaskey¹, D. I. Racine, M. E. Harlan, Y. Cheng², A. J. Newman, K. E. Lindenschmidt, M. N. Gooseff, and **K.N. Musselman**. Using Remote Sensing, Statistical, and Machine Learning Techniques to Assess Alaskan River Ice Phenology and Thickness. In review, Water Resources Research.

Thomas², P. A., D. Blaskey¹, Y. Cheng², M. P. Carey, H. K. Swanson, A. J. Newman, C. Brooks, N. M. Herman-Mercer, and **K. N. Musselman**. Warming Alaskan rivers affect first-year growth in critical northern food fishes. In review, Scientific Reports, special issue on ‘Freshwater Ecosystems Under Global Change’.

Newman, A.J., Y. Cheng², A. Craig, N. Herman-Mercer, D. Blaskey¹, P. Thomas², M.N. Gooseff, J.C. Koch, C. Brooks, E. Mutter, R. Toohey, M. Carey, and **K.N. Musselman**. Developing Actionable Regional Climate Models and Data for Communities and Decision-makers Across Alaska. In review, Bulletin of the American Meteorological Society.

Bush², S., A. Birch, **K.N. Musselman**, K. Lininger, and H. Barnard. Runoff composition is insensitive to summer rain contributions in a montane headwater stream, In review, Journal of Hydrology: Regional Studies.

Schwebs², L.J., A.D. Parsekian, T.J. Kelleners, M.S. Pleasants, N.A. Tarasewicz¹, and **K.N. Musselman**. Influence of coarse fragments on electrical resistivity saturation estimates. In review, Water Resources Research.

Dixit², A., **K.N. Musselman**, S. Rahimi, N. Addor, J. Vano, and F. Lehner. Assessing the resolution-dependency of simulated snowpack trends in the Upper Colorado River Basin. In Review, Geophysical Research Letters.

Published

[44] Blaskey¹, D., Cheng², Y., Newman, A. J., Koch, J. C., Gooseff, M. N., and **Musselman, K. N.** (2025). Alaskan Hydrology in Transition: Changing Precipitation and Evapotranspiration Patterns Are Projected to Reshape Seasonal Streamflow and Water Temperature by Midcentury (2035–64). *Journal of Hydrometeorology*, 26(5), 613-626.

[43] Harvey², N., Burns, S.P., **Musselman, K.N.**, Barnard, H.R., and Blanken, P.D., 2025. Testing Methods to Assess Snow Interception at a Continental Forested Site, *Water Resources Research*, 61(1), e2023WR036996.

[42] Cheng², Y., Craig, A., **Musselman, K.N.**, Bennett, A., Seefeldt, M.W., Hamman, J. and Newman, A.J., 2025. Coupled high-resolution land-atmosphere modeling for hydroclimate and terrestrial hydrology in Alaska and the Yukon River Basin (1990-2021). *Journal of Geophysical Research: Atmospheres*, 130(1), e2024JD041185.

[41] Hale², K.E., **Musselman, K.N.**, N. Bjarke², B. Livneh, E.S. Hinckley, and N.P. Molotch, 2024. Changes in snow water storage and hydrologic partitioning in an alpine catchment in the Colorado Front Range. *Hydrological Processes*, 38(7), e15206.

[40] Zlotnick², O.B., **Musselman, K.N.** and Levy, O., 2024. Deforestation poses deleterious effects to tree-climbing species under climate change. *Nature Climate Change*, 14(3), 289-295.

[39] Scaff², L., Krogh, S.A., **Musselman, K.N.**, Harpold, A., Li, Y., Lillo-Saavedra, M., Oyarzún, R. and Rasmussen, R., 2024. The impacts of changing Winter Warm Spells on snow ablation over Western North America. *Water Resources Research*, 60(5), p.e2023WR034492.

[38] Blaskey¹, D., Gooseff, M.N., Cheng², Y., Newman, A.J., Koch, J.C., and **Musselman, K.N.**, 2024, A high-resolution, daily hindcast (1990-2021) of Alaskan river discharge and temperature from coupled and optimized physical models. *Water Resources Research*, 60(4), e2023WR036217.

[37] Herman-Mercer, N.M., Andre, A., Buschman, V., Blaskey¹, D., Brooks, C., Cheng², Y., Combs, E., Cozzetto, K., Fitka, S., Koch, J., Lawlor, A., Moses, E., Murray E., Mutter, E., Newman, A.J., Prince, C., Salmon, P., Tlen, J., Toohey, R., Williams, M., and **Musselman, K.N.**, (2023), The Arctic Rivers Project: Using an Equitable Co-Production Framework for Integrating Meaningful Community Engagement and Science to Understand Climate Impacts. *Community Science*, 2(4), p.e2022CSJ000024.

- [36] Yang², K., Rittger, K., **Musselman, K.N.**, Bair, E. H., Dozier, J., Margulis, S. A., Painter, T.H., and Molotch, N.P. (2023). Intercomparison of snow water equivalent products in the Sierra Nevada California using airborne snow observatory data and ground observations. *Frontiers in Earth Science*, 11, 1106621.
- [35] Hale², K.E., Jennings, K.S., **Musselman, K.N.**, Livneh, B. and Molotch, N.P., (2023). Recent decreases in snow water storage in western North America. *Communications Earth & Environment*, 4(1).
- [34] Blaskey¹, D., Koch, J. C., Gooseff, M., Newman, A. J., Cheng², Y., O'Donnell, J., & **Musselman, K.N.** (2023). Increasing Alaskan river discharge during the cold season is driven by recent warming. *Environmental Research Letters*. 10.1088/1748-9326/acb661
- [33] Cheng², Y., **Musselman, K.N.**, Swenson, S., Lawrence, D., Hamman, J., Dagon, K., Kennedy, D. and Newman, A., (2023) Moving land models towards more actionable science: A novel application of the Community Terrestrial Systems Model across Alaska and the Yukon River Basin. *Water Resources Research*, p.e2022WR032204.
- [32] Seybold, E.C., Dwivedi², R., **Musselman, K.N.**, Kincaid, D.W., Schroth, A.W., Classen, A.T., Perdrial, J.N. and Adair, E.C., (2022). Winter runoff events pose an unquantified continental-scale risk of high wintertime nutrient export. *Environmental Research Letters*, 17(10), p.104044.
- [31] Yang², K., **Musselman, K.N.**, Rittger, K., Margulis, S. A., Painter, T. H., & Molotch, N. P. (2022). Combining ground-based and remotely sensed snow data in a linear regression model for real-time estimation of snow water equivalent. *Advances in Water Resources*, 160, 104075.
- [30] Wieder, W.R., Kennedy, D., Lehner, F., **Musselman, K.N.**, Rodgers, K.B., Rosenbloom, N., Simpson, I.R. and Yamaguchi, R., (2022). Pervasive alterations to snow-dominated ecosystem functions under climate change. *Proceedings of the National Academy of Sciences*, 119(30), p.e2202393119.
- [29] Webb², R. W., **K.N. Musselman**, S. Cifone, K.E. Hale, & N.P. Molotch (2022). Extending the vadose zone: Characterizing the role of snow for liquid water storage and transmission in streamflow generation. *Hydrological Processes*, 36(3), e14541.
- [28] Hale², K., A. Wlostowski², A.M. Badger, **K.N. Musselman**, B. Livneh, and N.P. Molotch, (2022). Modeling streamflow sensitivity to climate warming and surface water inputs in a montane catchment. *Journal of Hydrology: Regional Studies*, 39, p.100976.
- [27] **Musselman, K.N.**, N. Addor, J.A. Vano, and N.P. Molotch, (2021), Winter melt trends portend widespread declines in snow water resources. *Nature Climate Change* 11, 418–424.
- [26] Ikeda, K., R. Rasmussen, C. Liu, A. Newman, F. Chen, M. Barlage, E. Gutmann, J. Dudhia, A. Dai, C. Luce and **K.N. Musselman** (2021). Snowfall and snowpack in the Western US as captured by convection permitting climate simulations: current climate and pseudo global warming future climate. *Climate Dynamics*, pp.1-25.
- [25] Mendoza, P.A., T.E. Shaw, J. McPhee, **K.N. Musselman**, J.R. Revuelto, and S. MacDonell (2020), Seasonal and annual variability of snow depth fractal behavior in a sub-alpine catchment. *Water Resources Research*. 56(7), e2020WR027343
- [24] Uecher², T.M., S.D. Kaspari, **K.N. Musselman** and S.M. Skiles (2020), The post-wildfire impact of burn severity and age on black carbon snow deposition and implications for snow water resources, Cascade Range, Washington, USA. *Journal of Hydrometeorology*. 21(8), 1777-1792.
- [23] Henn², B., **K.N. Musselman**, L. Lestak, F.M. Ralph, and N.P. Molotch (2020), Extreme runoff generation from atmospheric river driven snowmelt during the 2017 Oroville Dam spillways incident. *Geophysical Research Letters*, 47(14).
- [22] Mendoza, P.A., **K.N. Musselman**, J.S. Deems, J.R. Revuelto, I. Lopez-Moreno, and J. McPhee (2020), Seasonal and annual variability of snow depth fractal behavior in a sub-alpine catchment. *Water*

Resources Research, 55(7).

- [21] Giroto, M., **Musselman, K.N.**, and Essery, R.L. (2020), Data Assimilation Improves Estimates of Climate-Sensitive Seasonal Snow. *Current Climate Change Reports*, 6, 81–94.
- [20] **Musselman, K.N.**, F. Lehner, K. Ikeda, M.P. Clark, A.F. Prein, C. Liu, M. Barlage and R. Rasmussen (2018), Projected increases and shifts in rain-on-snow flood risk over western North America. *Nature Climate Change*, 8, 808-812.
- [19] Isabelle², P.E., D.F. Nadeau, M.H. Asselin, R. Harvey, **K.N. Musselman**, A.N. Rousseau, F. Anctil (2018), Solar radiation transmittance of a boreal balsam fir canopy: Spatiotemporal variability and impacts on growing season hydrology, *Agricultural and Forest Meteorology*, 263, 1-14.
- [18] **Musselman, K.N.**, M. P. Clark, C. Liu, K. Ikeda and R. Rasmussen (2017), Slower snowmelt in a warmer world. *Nature Climate Change*, 7(3), 214-219.
- [17] **Musselman, K.N.**, N.P. Molotch, and S.A. Margulis, Snowmelt response to simulated warming across a large elevation gradient, southern Sierra Nevada, California. (2017) *The Cryosphere*, 11(6) 2847-2866.
- [16] López-Moreno, I., S. Gascoin, J. Herrero, E. Spoles, M. Pons, E. Alonso, J. Sickman, **K.N. Musselman**, A. Boudhar, L. Hanich, N. Molotch, J. Pomeroy (2017), Different sensitivities of snowpack to warming in Mediterranean climate mountain areas. *Environmental Research Letters*, 12(7), 074006.
- [15] **Musselman, K.N.** and J.W. Pomeroy (2017), Estimation of needleleaf canopy and trunk temperatures and longwave contribution to melting snow. *Journal of Hydrometeorology*. 18, 555-572.
- [14] **Musselman, K.N.**, J.W. Pomeroy, R. Essery, and N. Leroux (2015), Impact of windflow calculations on simulations of alpine snow accumulation, redistribution and ablation. *Hydrological Processes*, 29(18), 3983-3999.
- [13] **Musselman, K.N.**, J.W. Pomeroy, and T.E. Link (2015), Variability in shortwave irradiance caused by forest gaps: Measurements, modelling, and implications for snow energetics. *Agricultural and Forest Meteorology*, 207, 69:82.
- [12] Harpold, A.A., J.A. Marshall, S.W. Lyon, T.B. Barnhart, B. Fisher, M. Donovan, K.M. Brubaker, C.J. Crosby, N.F. Glenn, C.L. Glennie, P.B. Kirchner, N. Lam, K.D. Mankoff, J.L. McCreight, N.P. Molotch, **K.N. Musselman**, J. Pelletier, T. Russo, H. Sangireddy, Y. Sjöberg, T. Swetnam, and N. West (2015), Laser Vision: LiDAR as a Transformative Tool to Advance Critical Zone Science. *Hydrology and Earth System Sciences*. 19, 2881–2897.
- [11] Meromy, L., N.P. Molotch, M. Williams, **K.N. Musselman**, and L. Kueppers (2015), Snowpack-climate manipulation using infrared heaters in subalpine forests of the Southern Rocky Mountains, USA. *Agricultural and Forest Meteorology*, 203, 142-157.
- [10] Harpold, A.A., N.P. Molotch, **K.N. Musselman**, R.C. Bales, P.B. Kirchner, M. Litvak, and P.D. Brooks (2015), Snowmelt infiltration in mixed conifer subalpine forests. *Hydrological Processes*, 29(12), 2782-2798.
- [9] Harpold, A.A., Q. Guo., N. Molotch, P.D. Brooks, R. Bales, J.C. Fernandez-Diaz, **K.N. Musselman**, T.L. Swetnam, P. Kirchner, M. Meadows, J. Flanagan, and R. Lucas (2014), LiDAR-derived snowpack datasets from mixed conifer forests across the Western U.S., *Water Resources Research*. 50(3), 2749-2755.
- [8] Perrot, D.O., N.P. Molotch, **K.N. Musselman**, and E.T. Pugh (2014), Modeling the effects of the Mountain Pine Beetle on snowmelt rates in a subalpine forest. *Ecohydrology*. 7(2), 226-241.
- [7] **Musselman, K.N.**, S.A. Margulis, and N.P. Molotch (2013), Estimation of solar direct beam transmittance of conifer canopies from airborne LiDAR. *Remote Sensing of Env.* 136, 402-415.

- [6] Huang, C., S.A. Margulis, M.T. Durand, and **K.N. Musselman** (2012), Assessment of snow grain-size model and stratigraphy representation impacts on snow radiance assimilation: Forward Modeling Evaluation, *IEEE Transactions on Geoscience and Remote Sensing*, 50(11) 4551 – 4564.
- [5] López-Moreno, J.I., S.R. Fassnacht, J.T. Heath, **K.N. Musselman**, J. Revuelto, J. Latron, E. Morán-Tejeda, T. Jonas (2012), Small scale spatial variability of snow density and depth over complex alpine terrain: Implications for estimating snow water equivalent, *Advances in Water Research*, 55, 40-52.
- [4] **Musselman, K.N.**, N.P. Molotch, S.A. Margulis, M. Lehning, and D. Gustafsson (2012), Improved snowmelt simulations with a canopy model forced with photo-derived direct beam canopy transmissivity, *Water Resources Research*, 48(10).
- [3] **Musselman, K.N.**, N.P. Molotch, S.A. Margulis, P.B. Kirchner, and R.C. Bales (2012), Influence of canopy structure and direct beam solar irradiance on snowmelt rates in a mixed conifer forest. *Agricultural and Forest Meteorology*, 161, 46 – 56.
- [2] Molotch, N.P., P.D. Brooks, S.P. Burns, M. Litvak, R.K. Monson, J.R. McConnell, and **K.N. Musselman** (2009), Ecohydrological controls on snowmelt partitioning in mixed-conifer sub-alpine forests, *Ecohydrology*, 2, 129–142.
- [1] **Musselman, K.N.**, N.P. Molotch, and P.D. Brooks, (2008), Effects of vegetation on snow accumulation and ablation in a mid-latitude sub-alpine forest, *Hydrological Processes*, 22(15), 2767-2776.

PUBLISHED DATA SETS

Koch, J.C., E. Mutter, **K.N. Musselman, K.N.**, and M.R. Hendon, 2024, Continuous temperature and specific conductance from the Yukon River and arctic Rivers in Alaska: U.S. Geological Survey data release, <https://doi.org/10.5066/P13IAWWA>

INVITED TALKS, COLLOQUIA, AND PANELS - 32 TOTAL

2024: Swiss Consulate Colloquium on Climate Change Impacts on Snow
2024: U.S. Congress, Briefing Organized by the U.S. Senate Arctic Caucus & Committee of Indian Affairs, Washington, DC.
2024: Hydrologic Sciences Symposium, University of Colorado, Boulder
2024: Kuskokwim Watershed Council Meeting, Co-produced Climate Data
2023: NCAR CESM Annual Meeting, Actionable Science, Boulder, CO.
2023: Protect Our Winters, Outdoor Industry Leaders Night, Denver, CO.
2022: Montana State University, Land Resources and Env Sci, Bozeman, MT
2022: Scripps Institute of Oceanography, CW3E.
2022: Van Tuyl Lecture, Colorado School of Mines, Golden, CO.
2022: Yampa Basin Rendezvous, Steamboat Springs, CO.
2022: DOE Integrated Mountainous Hydroclimate Workshop.
2022: DOE Watershed Function Science Community Call.
2021: USGS North Central Climate Adaptation Science Center Seminar
2021: NOAA National Integrated Drought Information System, Pacific Northwest Drought Early Warning System Webinar.
2021: Cornell University, Earth and Atmospheric Sciences Seminar.
2021: University of Colorado Boulder, Geography Colloquium
2021: University of Colorado Boulder, INSTAAR Seminar Series.
2020: Airborne Snow Observatory, Inc. Annual Meeting
2020: Niwot Ridge LTER Annual Meeting, University of Colorado, Boulder

2019: Department of Civil Engineering, Univer. de Chile, Santiago, Chile
2019: Lawrence Berkley National Lab, Berkley, CA.
2019: Hydrologic Sciences Symposium, University of Colorado, Boulder
2019: National Center for Atmospheric Research, Boulder, CO
2018: University of Calgary, Dept. of Geography, Calgary, Alberta
2018: Rocky Mountain Association of Professional Geologists, Denver, CO.
2018: NOAA Physical Sciences Division, Earth System Research
Laboratory, Boulder, CO.
2018: Cross Country Ski Area Association Annual Meeting, Granby, CO.
2017: Hydrology & Water Resources Seminar, Dept. of Civil, Environmental
& Architectural Engineering, University of Colorado, Boulder
2016: University of Vermont, Dep. Geology Lecture Series, Burlington, VT.
2016: Pennsylvania State University, Ecosystem Science & Management., State College, PA.
2015: University of Calgary, Dept. of Geography, Calgary, Alberta

CONFERENCE PRESENTATIONS - 126 TOTAL

Challamel, A., A.J. Newman, K.N., D. Blaskey, Y. Cheng, and K.N. Musselman, 2025. Assessing the Shifting Nature of Large Runoff Events and the Relative Contributions of Rain, Snowmelt, and Rain-on-Snow in Alaska. Western Snow Conference, Bozeman, MT. May 19-22, 2025.

Gilbert, C., D. Blaskey, T. Eidhammer, P. Kirchner, and K.N. Musselman, 2025. Quantifying the Impact of Snow to Rain Transition on River Temperature and Discharge across Southeast Alaska. Western Snow Conference, Bozeman, MT. May 19-22, 2025.

Carr., S., A. Dixit, F. Lehner, N. Addor, J. Vano, and K.N. Musselman, 2025. Investigating the Emergence of Climate Change Signals in the Upper Colorado River Basin. Western Snow Conference, Bozeman, MT. May 19-22, 2025.

Newman., A.J., K.N. Musselman and coauthors. Developing Actionable Regional Climate Models and Data for Communities and Decision-makers Across Alaska, Arctic Science Summit Week, Boulder, CO. March 20-28, 2025.

Bacon, J., A. Minium, D. Ebanks, N. Herman-Mercer, D. Blaskey, S. Neitlich, P. Thomas, R. Toohey, and K.N. Musselman, 2025. Community Climate Change Resilience Planning as Informed by Native Alaskan Adaptations and Experiences, Arctic Science Summit Week, Boulder, CO. March 20-28, 2025.

Musselman, K.N. et al., 2025. The Arctic Rivers Project: A co-produced assessment of the climate sensitivity of Alaskan & Yukon rivers and fish to support resilient Indigenous communities, 2025. Arctic Science Summit Week, Boulder, CO. March 20-28, 2025.

Schwebs, L., Parsekian, A., Tarasewicz, N., Musselman, K.N., and Minckley, T.A., 2024. Geophysical and Paleoecological Characteristics of a Wetland and Subalpine Forest Ecotone. AGU Fall Meeting, 9-13 December 2024.

Musselman, K.N., Tarasewicz, N., Schwebs, L., Parsekian, A., Bailey, K., Parsons, C., Kelsey, K., Buma, B., Knowles, J.F., Hinckley, E.S., Parker, J. and Blanken, P., 2024. The EcoTram: New measurements permit the study of lateral connectivity of landscapes, energy, and water in the Como Creek watershed, Colorado. AGU Fall Meeting, 9-13 December 2024.

D. Blaskey, M. Harlan, and K.N. Musselman, 2024, Using Remote Sensing, Statistical, and Machine Learning Techniques to Assess Alaskan River Ice Phenology and Thickness. AGU Fall Meeting, 9-13 December 2024.

- Dixit, A., Rahimi, S., Haung, L., Addor, N., Vano, J.A., Musselman, K.N., and Lehner, F., 2024. Model resolution sensitivity of time of emergence for snow metrics in the Upper Colorado River Basin. AGU Fall Meeting, 9-13 December 2024.
- Hale, K.E., Musselman, K.N., N. Bjarke, B. Livneh, E.S. Hinckley, and N.P. Molotch, 2024. Impacts of snowpack heterogeneity on hydrologic partitioning in an alpine catchment. AGU Fall Meeting, 9-13 December 2024.
- Yang, K., Rittger, K., Musselman, K.N., Bair, E. H., Dozier, J., Margulis, S. A., Painter, T.H., and Molotch, N.P., 2024. Intercomparison of snow water equivalent datasets using Airborne Snow Observatory data and ground-based observations. AGU Fall Meeting, 9-13 December 2024.
- Conway, J.P., Cattoën, C., Redpath, T., Lin, Y., Carey-Smith, T., Sirguey, P.J., Porhemmat, R., Cullen, N.J., Booker, D., Musselman, K.N., and Essery, R., 2024. Developing a National-scale Snowmelt Forecast System for New Zealand. AGU Fall Meeting, 9-13 December 2024.
- Tarasewicz, N., Blanken, P., Schwebs, L., Parsekian, A., Bailey, K., Parsons, C., Parker, J., Greenberg, C., Kelsey, K., Buma, B., Knowles, J.F., Hinckley, E.S., Barnard, H.R. and Musselman, K.N., 2024. Fine-Scale Observations and LiDAR Raytrace Modeling of Subalpine Canopy Structure on Energy and Water Availability. AGU Fall Meeting, 9-13 December 2024.
- Hale, K., Musselman, K.N., Bjarke, N.R., Livneh, B., and Hinckley, E.L., 2024. Changes in Snow Water Storage and Hydrologic Partitioning in Western North America. In *Geological Society of America Abstracts* (Vol. 56, p. 401759).
- Blaskey, D., Y. Cheng, A. J. Newman, J. C. Koch, M. N. Gooseff, and K. N. Musselman, 2024: Using remote sensing, statistical, and machine learning techniques to assess Alaskan river ice phenology and thickness. AGU Fall Meeting, 9-13 December 2024.
- Newman, A.J., Cheng, Y., Craig, A., Seefeldt, M.W., Herman-Mercer, N.M., and Musselman, K.N., 2024. An ensemble of high-resolution regional climate simulations over Alaska and the Yukon River for understanding hydroclimatic change, AGU Fall Meeting, 9-13 December 2024.
- Cheng, Y., A. J. Newman, and co-authors, 2024: Two suites of 4km-resolution WRF-CTSM simulations in Alaska and Yukon River Basin for historical and mid 21st century climate. NCAR ESPAT Community Workshop, Boulder CO, 10-12 April 2024.
- Cheng, Y., A. J. Newman, N. M. Herman-Mercer, K. N. Musselman, C. Woelfle-Hazard, D. Sarna-Wojcicki, D. Blaskey, P. Thomas, D. Lombardozzi, D. E. Touma, N. Mizukami, and M. A. Morrison, 2024: Towards co-designed numerical modeling to reflect priorities from Indigenous communities. AGU Fall Meeting, 9-13 December 2024.
- Musselman, K. N., and co-authors, 2024: The Arctic Rivers Project: A co-produced assessment of the climate sensitivity of Alaskan & Yukon rivers and fish to support resilient Indigenous communities. AGU Fall Meeting, 9-13 December 2024.
- Musselman, K. N. and co-authors, 2024: The Arctic Rivers Project: A co-produced assessment of the climate sensitivity of Alaskan & Yukon rivers and fish to support resilient communities. NSF NNA Community Meeting, Washington DC, 5-7 March 2024.
- Newman, A. J. and co-authors, 2024: Regional climate downscaling within the Arctic Rivers Project. NSF NNA Community Meeting, Washington DC, 5-7 March 2024.
- Blaskey, D. and co-authors, 2024: Assessing the impacts of climate change on arctic river discharge, temperature, and ice dynamics. NSF NNA Community Meeting, Washington DC, 5-7 March 2024.
- Newman, A. J., and co-authors, 2024: 'Regional climate downscaling and evaluation across Alaska' NCAR Water System Program Retreat, 25-27 March 2024.

Newman, A. J., Y. Cheng, A. Craig, M. W. Seefeldt, N. M. Herman-Mercer, and K. N. Musselman, 2024: An ensemble of high-resolution regional climate simulations over Alaska and the Yukon River for understanding hydroclimatic change. AGU Fall Meeting, 9-13 December 2024.

Blaskey, D., M. Harlan, and K.N. Musselman, 2024, Assessing Backscatter from Synthetic Aperture Radar for the Retrieval of Regional River Ice Phenology and Thickness Data, 27th IAHR International Symposium on Ice, Gdańsk, Poland.

Thomas, P., Blaskey, D., Cheng, Y., Carey, M., Swanson, H.K., Newman, A.J., **Musselman, K.N.** and Brooks, C.M., Looking to the Past to Inform the Future: Bioenergetics modeling of Yukon River fishes, 2024, *Ocean Sciences Meeting*. AGU. New Orleans, LA.

Newman, A.J., Cheng, Y., **Musselman, K.N.**, Hazard, C.W., Sarna-Wojcicki, D., Mizukami, N., Lombardozzi, D.L. and Herman-Mercer, N.M., 2023, Co-producing usable regional climate and land-surface models with and for communities. American Geophysical Union Fall Meeting, San Francisco.

Blaskey, D., Gooseff, M. N., Cheng, Y., Koch, J., Newman, A. J., & **Musselman, K.N.**, 2023, Alaskan River Temperatures Projected to Steadily Increase by Mid-century Despite Disparate Trends in Summer Streamflow. American Geophysical Union Fall Meeting, San Francisco, CA.

Hale, K., **Musselman, K. N.**, Bjarke, N. R., Livneh, B., Hinckley, E. L. S., & Molotch, N. P., 2023, Changes in snow water storage and hydrologic partitioning across spatial scales in western North America. American Geophysical Union Fall Meeting, San Francisco, CA.

Cheng, Y., Newman, A.J., **Musselman, K.N.**, Craig, A., Hamman, J., & Herman-Mercer, N. M., 2023. Two suites of 4km-resolution WRF-CTSM simulations in Alaska and Yukon River Basin for historical and mid 21st century climates. American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., A.J. Newman, Y. Cheng, D. Blaskey, K. Cozzetto, C. Brooks, P. Thomas, and N. Herman-Mercer, The Arctic Rivers Project: Combining Monitoring, Modeling, and Indigenous Knowledge, 2023, CESM Workshop, Actionable Science, National Center for Atmospheric Research, Boulder, CO, June 2023.

Margulis, S.A., Yueh, S., Deeb, E., Dozier, J., Elder, K., Entekhabi, D., Giroto, M., Gutmann, E.D., Harpold, A., Hughes, M.R., **Musselman, K.N.**, and Lettenmaier, D.P., 2023, January. Measuring Mountain Snow from Space: A Mission Concept Using P-band Signals of Opportunity. In *103rd AMS Annual Meeting*. AMS, Denver, CO.

Scaff, L., Krogh, S., **Musselman, K.N.**, Harpold, A., Lillo-Saavedra, M., Oyarzún, R., Li, Y. and Rassmusen, R.. *Winter Warm Spells and snowpack ablation in western North America* (No. EGU23-6903). Presented at the European Geophysical Union Annual Meeting, Vienna, Austria. 2023

Musselman, K.N., P. Blanken, B. Buma, A. Carrico, E. Hinkley, K. Kelsey, J. Knowles, F. Lehner, E. Oladeji, A. Parsekian, L.J. Schwebs, N. Tarasewicz, W. Wieder, and E. Woolner, 2022, The Front Range Ecosystem Resilience Project – Co-defining climate refugia to inform effective management of mountain headwater systems. Poster presented at CIRMOUNT MtnClim, Gothic, CO, Sept. 2022.

Musselman, K.N., A.J. Newman, Y. Cheng*, D. Blaskey, K. Cozzetto, C. Brooks, and N. Herman-Mercer, 2022, Informing climate and land surface model decisions with Indigenous guidance. Oral presentation at AGU *Frontiers in Hydrology Meeting*, Puerto Rico.

Cheng, Y., A. Newman, **K.N. Musselman**, A. Craig, N. Herman-Mercer, K. Cozzetto, C. Brooks, D. Blaskey, J. Hamman, S. Swenson, D. Lawrence, 2022. Actionable earth-climate science: high-resolution coupled land-atmosphere modeling for Alaska informed by knowledge co-production (invited talk), *CESM workshop 2022*, Boulder, CO

Cheng, Y., A. Newman, S. Swenson, D. Lawrence, **K.N. Musselman**, J. Hamman, D. Kennedy, K. Dagon, 2022. Moving complex land-surface models towards actionable science: A novel application of

the Community Terrestrial Systems Model across Alaska and the Yukon River Basin (oral), *NCAR Land Model Working Group 2022*, virtual

Cheng, Y., A. Newman, **K.N. Musselman**, A. Craig, D. Lawrence, S. Swenson, J. Hamman, 2022. High-resolution coupled land-atmosphere modeling cross Alaska and the Yukon River Basin (oral), *102nd American Meteorological Society Annual Meeting*, Virtual

Newman, A. J., Y. Cheng, **K.N. Musselman**, A. Craig, J. Hamman, S. Swenson, D. Lawrence, K. Dagon, D. Kennedy, and the Arctic Rivers Research Team, 2022. Hydrometeorology and terrestrial hydrology across Alaska: a high-resolution coupled land-atmosphere modeling system guided by knowledge co-production (oral). WCRP km-scale workshop, Boulder, CO, 3-7 October.

Newman, A. J., A. Wood, E. Gutmann, Y. Cheng, N. Lybarger, A. Smith, **K.N. Musselman**, C. Frans, and J. Arnold, 2022. Challenges and opportunities for water resource focused actionable Earth System Science (invited oral). American Geophysical Union Fall Meeting, Chicago, IL, 12-16 December.

Blaskey, D., Koch, J., Gooseff, M., Newman, A., Cheng, Y., and **Musselman K.N.**, 2022. Developing a High Resolution Model of Historic (1990-2020) Alaskan River Temperatures. Oral presentation, American Geophysical Union Fall Meeting, Chicago, IL, 12-16 December.

Cheng, Y., A. Newman, **K.N. Musselman**, N. Herman-Mercer, A. Craig, J. Hamman, 2022. Climate impacts on terrestrial hydrology and hydrometeorology in Alaska and Yukon River Basin: a modeling effort guided by Indigenous Knowledge (virtual poster), *NNA Annual Community Meeting*, virtual

Cheng, Y., A. Newman, **K.N. Musselman**, S. Swenson, D. Lawrence, J. Hamman, K. Dagon, D. Kennedy, 2022. Moving land models towards actionable science: A novel application and multi-objective optimization of the Community Terrestrial Systems Model across Alaska and the Yukon River Basin (oral), *WCRP km-scale workshop*, Boulder, CO

Cheng, Y., A. Newman, **K.N. Musselman**, A. Craig, J. Hamman, 2022. Climate impacts on Alaska and Yukon hydrometeorology: a modeling effort guided by Indigenous Knowledge (poster), *AGU Chapman Conference on Water Availability*, Golden, CO.

Newman, A.J., Wood, A., Gutmann, E.D., Cheng, Y., Lybarger, N.D., Smith, A., Lehner, F., **Musselman, K.N.**, Frans, C.D. and Arnold, J.R., 2022, December. Challenges and opportunities for water resource focused actionable Earth System Science. In *Fall Meeting 2022*. AGU.

Rittger, K., **Musselman, K.N.**, Skiles, M., Stillinger, T., Bair, N., Serreze, M.C., Brodzik, M.J. and Mankoff, K.D., 2022, December. Advancing domestic and international water management capabilities with a global daily snow cover and albedo product. In *Fall Meeting 2022*. AGU.

Schwebs, L., Parsekian, A., Tarasewicz, N. and **Musselman, K.N.**, 2022, December. Time-Lapse Electrical Resistivity Tomography Characterization of the Vadose Zone in a Montane Watershed. In *Fall Meeting 2022*. AGU.

Cheng, Y., Newman, A.J., **Musselman, K.N.**, Craig, A., Hamman, J. and Bennett, A., 2022, December. Hydrometeorology and terrestrial hydrology in Alaska and Yukon River Basin: a high-resolution coupled land-atmosphere modeling (1990-2020) informed by knowledge co-production. In *Fall Meeting 2022*. AGU.

Musselman, K.N., F. Lehner, T. Eidhammer, A. Pendergrass, and E. Gutmann (2021), Assessing the predictability and probability of 21st century rain-on-snow flood risk for the conterminous U.S., AGU Fall Meeting.

Newman, A., Cheng, Y., **Musselman, K.N.**, Craig, A., Swenson, S., Hamman, J., & Lawrence, D. (2021). High-Resolution Regional Climate Simulations of Arctic Hydroclimatic Change. American Geophysical Union Fall Meeting.

- Livneh, B., N.R. Bjarke, K. Marvel, A. Pendergrass, J.J. Barsugli, E.D. Gutmann, P. Williams, K.N. Musselman, F. Lehner, K.M. Grise, D. Schmidt, and M.P. Hoerling (2021), The primary drivers of climate change impacts on the terrestrial water cycle, AGU Fall Meeting.
- Cheng, Y., A.J. Newman, S.C. Swenson, D.M. Lawrence, K.N. Musselman, and J. Hamman (2021), A novel application and multi-objective optimization of CTSM: Arctic hydrology in Alaska and Yukon River Basin, AGU Fall Meeting.
- Rittger, K., M.C. Serreze, M.J. Brodzik, **K.N. Musselman**, T. Stilling, N. Bair, M. Skiles (2021), Snow Today at the National Snow and Ice Data Center, AGU Fall Meeting.
- Hale, K., **K.N. Musselman**, K.S. Jennings, and N.P. Molotch (2021), Changes in snow water storage and hydrologic partitioning across the Western United States, AGU Fall Meeting.
- Yang, K., **K.N. Musselman**, K. Rittger, SA Margulis, TH Painter, and NP Molotch (2021) Improving the estimation of snow water equivalent in a Linear Regression Model using remotely sensed snow cover data, AGU Fall Meeting.
- Herman-Mercer, N., Cozzetto, K., & **Musselman, K.N.** (2021). *Working with an Indigenous Advisory Council to facilitate effective communication and collaboration between researchers and Arctic communities* (No. EGU21-16368). European Geophysical Union Annual Meeting.
- Newman, A., Cheng, Y., **Musselman, K.N.**, Craig, A., Swenson, S., Hamman, J., & Lawrence, D. (2021). *High-Resolution Regional Climate Simulations of Arctic Hydroclimatic Change* (No. EGU21-6085). European Geophysical Union Annual Meeting.
- Musselman, K.N.** (2021) The Arctic Rivers Project: A Co-produced Assessment of the Climate Sensitivity of Rivers, Fish and Communities, 50th Arctic Workshop. Virtual.
- Musselman, K.N.**, N. Addor, J.A. Vano, and N.P. Molotch, (2020), Melting winter snowpack signals a growing threat to water security not captured by operational metrics. *AGU Fall Meeting 2020*.
- Vano, J.A., J.R. Arnold, M.P. Clark, B. Nijssen, E.D. Gutmann, A.W. Wood, F. Lehner, **K.N. Musselman**, J. Hamman, N. Addor & A.J. Newman (2020, December), Dos and Don'ts for navigating model selection in climate change work for water planning and management, In *AGU Fall Meeting 2020*.
- Safa, H., **Musselman, K. N.**, Krogh, S.A., & Harpold, A.A. (2020, December). How well do we melt snow? A multi-model intercomparison project (MuMIP) illustrates the challenges of hydrological prediction. In *AGU Fall Meeting 2020*.
- Yang, K., **Musselman, K. N.**, Jennings, K. S., & Molotch, N. P. (2020, December). Climate and topographic controls on the variability of snow water equivalent and snowmelt in a continental alpine watershed. In *AGU Fall Meeting 2020*.
- Hale, K., Molotch, N.P., & **Musselman, K.N.** (2020, December). Water Towers of the West: Where are they and how have they changed? *AGU Fall Meeting 2020*.
- Kaspari, S., Uecker, T.M., **Musselman, K.N.**, & Skiles, M. (2020, December). The Post-Wildfire Impact of Burn Severity and Age on Black Carbon Snow Deposition and Implications for Snow Water Resources, Cascade Range, Washington, USA. In *AGU Fall Meeting 2020*.
- Webb, R., **Musselman, K.N.**, Hale, K., Ciafone, S., & Molotch, N.P. (2020, December). Characterizing a Snowpack's Ability to Store Liquid Water at the Small Catchment Scale—A Comparison of Ground-Based Remote Sensing Observations and Hydrologic Modeling. In *AGU Fall Meeting*.
- Webb, R., **Musselman, K.N.**, Hale, K., & Molotch, N. (2020, November). Monitoring a snowpack's ability to store liquid water at the small catchment scale. In *18th Int'l Conference on Ground Penetrating Radar* (pp. 101-104). Society of Exploration Geophysicists.

Pinto Escobar, F., Mendoza, P. A., Shaw, T. E., Revuelto, J., **Musselman, K.N.**, & McPhee, J. (2020, May). Wind effects on the spatial distribution of snow and seasonal water balance in two Mediterranean basins. In *EGU General Assembly Conference Abstracts* (p. 10994).

Mendoza, P., Shaw, T., Pinto, F., Lagos, M., Revuelto, J., **Musselman, K.N.**, MacDonell, S. & McPhee, J., (2020, May). Scaling behavior of lidar-derived snow depth across the semi-arid Chilean Andes. In *EGU General Assembly Conference Abstracts* (p. 11313).

Yang, K., **Musselman, K. N.** & Molotch, N. P. (2019, December). Bias Correction of Snow Water Equivalent Estimates in near real-time over the California Sierra Nevada. *AGU Fall Meeting 2019*.

Ackroyd, C., M. Skiles, K. Rittger, S. Supper, **K.N. Musselman** (2019, December). A Comparison of WorldView and MODIS in Detecting Fractional Snow Cover over High Mountain Asia. *AGU Fall Meeting 2019*.

K. Rittger, **K.N. Musselman**, A.L. Dugger, M.J. Brodzik, B. Rajagopalan, W. Kleiber, K.J. Bormann, H.G.V. Chan, W.P. Doan, & T.H. Painter (2019, December). Multi-platform, multi-sensor snow surface properties for energy balance and model validation. *AGU Fall Meeting 2019*.

Musselman, K.N., H.T. Berglund, K. Yang, & N.P. Molotch (2019, December). Monitoring the Sierra Nevada's water balance and deficits using GPS-derived vertical displacement time series data. *AGU Fall Meeting 2019*.

Musselman, K.N., A.J. Newman, & F. Lehner (2019, December). Projected end-of-century changes in water available for runoff across mountain basins of western North America. *AGU Fall Meeting 2019*. Invited.

Vano, J.A., J.R. Arnold, M.P. Clark, B. Nijssen, E.D. Gutmann, A.W. Wood, F. Lehner, J. Hamman, N. Addor, A.J. Newman & **K.N. Musselman** (2019, December). Dos and Don'ts for Supporting Better Water Management in a Changing Climate, In *AGU Fall Meeting 2019*. Invited.

Musselman, K.N., N. Addor, J. Vano, & N.P. Molotch, (2019, April) Reconsidering the utility of the April 1st snow water equivalent metric for water resource applications. Oral presentation at the Western Snow Conference, Reno, NV.

Yang, K., **K.N. Musselman**, K. Rittger, & N.P. Molotch (2019 April), Bias correction of SWE estimates with the NASA Airborne Snow Observatory SWE data. Oral presentation at the Western Snow Conference, Reno, NV.

Musselman, K.N., B. Henn, F.M. Ralph, L. Lestak, and N.P. Molotch (2018), The role of atmospheric river rain-snow levels and antecedent snowpack in the 2017 Oroville Dam crisis. Oral presentation at the American Meteorological Society Mountain Meteorology Conference, Santa Fe, NM.

Musselman, K.N., N. Addor, J. Vano, J. Berggren, and N. Molotch, (2018) Reconsidering the utility of the April 1st snow water equivalent metric. Oral presentation at the Eastern Snow Conference, College Park, MD.

Mendoza, P.A., **K.N. Musselman**, I. López-Moreno, R. Essery, N.P. Molotch, and J. McPhee, (2018), The effects of geospatial decisions on the accuracy of a distributed blowing snow model, Oral presentation at the European Geophysical Union General Assembly, Vienna, Austria.

Musselman, K.N., F. Lehner, K. Ikeda, M.P. Clark, A. Prein, C. Liu, M. Barlage and R. Rasmussen (2018), Projected increases and shifts in rain-on-snow flood risk over western North America. Oral presentation at the Western Snow Conference, Albuquerque, NM.

Henn, B., **K.N. Musselman**, F.M. Ralph, L. Lestak, and N.P. Molotch (2018), The role of atmospheric river rain-snow levels and antecedent snowpack in the 2017 Oroville Dam crisis. Oral presentation at the Western Snow Conference, Albuquerque, NM.

Musselman, K.N., M.P. Clark, B. Nijssen and J. Arnold (2017), Challenges in land model representation of heat transfer in snow and frozen soils. Oral presentation at the American Geophysical Union Fall Meeting, New Orleans, LA.

Musselman, K.N., F. Lehner, K. Ikeda, M.P. Clark, A. Prein, C. Liu, M. Barlage and R. Rasmussen (2018), Large projected increases in rain-on-snow flood potential over western North America. Oral presentation at the American Geophysical Union Fall Meeting, New Orleans, LA. Invited.

Musselman, K.N., F. Lehner, K. Ikeda, M.P. Clark, A. Prein, C. Liu, M. Barlage and R. Rasmussen (2017), Projected increases in rain-on-snow flood potential over western North America. Annual Meeting of the Rocky Mountain Hydrologic Research Center, Boulder, Colorado.

Musselman, K.N., M.P. Clark, Changhai Liu, Kyoko Ikeda, and R. Rasmussen (2017), Slower snowmelt in a warmer world. Oral presentation at the European Geophysical Union General Assembly, Vienna, Austria.

Musselman, K.N., M.P. Clark, A. Endalamaw, W.R. Bolton, B. Nijssen and J. Arnold (2017), Assessing the effects of modeling decisions on cold region hydrologic model performance. Interactive Poster presentation at the European Geophysical Union General Assembly, Vienna, Austria.

Musselman, K.N., M.P. Clark, Changhai Liu, Kyoko Ikeda and R. Rasmussen (2016), Slower snowmelt in a warmer world. Oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA. Invited.

Musselman, K.N., M.P. Clark, A. Endalamaw, W.R. Bolton, B. Nijssen and J. Arnold (2016), Effects of model decisions on cold region hydrologic model performance: snow, soil and streamflow. Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Monaghan, A.J., M.P. Clark, J.R. Arnold, A.J. Newman, **K.N. Musselman**, M.J. Barlage, L. Xue, C. Liu, E.D. Gutmann and R. Rasmussen (2016), High resolution regional climate change simulations over Alaska. Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., M.P. Clark, Changhai Liu, Kyoko Ikeda and R. Rasmussen (2016). Evidence for slower snowmelt in a warmer world. Oral presentation at the Mountain Climate Conference, Leavenworth, Washington.

Musselman, K.N., M.P. Clark, A. Endalamaw, W.R. Bolton, B. Nijssen (2016), A Multi-Decadal Analysis of Cold Region Hydrological Model Performance and Challenges at the Caribou – Poker Creeks Research Watershed. Oral presentation at the American Water Resources Association Spring Specialty Conference ‘Water – Energy – Environment’, Anchorage, Alaska

S. Gascoin, J.I. López-Moreno, J. Herrero, E. Sproles, L. Hanich, A. Boudhar, M. Pons, E. Alonso-González, and **K.N. Musselman** (2016), Spatio-temporal variability of the snow cover in different Mediterranean mountain regions from in situ and remote sensing data, oral presentation at the European Geosciences Union General Assembly, Vienna, Austria.

Musselman, K.N., N.P. Molotch, and S.A. Margulis (2015), Snowpack response to warmer temperatures: a southern Sierra Nevada case study, invited oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N. and J.W. Pomeroy (2015), The influence of tree temperatures on potential snowmelt energy in a discontinuous coniferous forest, poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Arnold, J., M. Clark, J. Cherry, T. Giambelluca, E. Gutmann, G. Liston, M. Sturm, A. Monaghan, **K.N. Musselman**, A. Newman, R. Rasmussen, and A. Wood (2015), New tools and data to understand and adapt to hydroclimatic variability and change in Alaska and Hawaii, poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N. and J.W. Pomeroy (2015), A snow – canopy energy balance model for disturbed forested environments, oral presentation at the Joint Canadian Geophysical Union and American Geophysical Union Spring Meeting, Montreal.

Musselman, K.N., N.P. Molotch, and S.A. Margulis (2014), Snowmelt sensitivity to warmer temperatures: a field-validated model analysis, southern Sierra Nevada, California, California, poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N. and J.W. Pomeroy (2014), Ray trace modeling to determine optimal forest canopy gap size for reduced solar irradiance during snowmelt: field verification and continental scale application, invited oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Leroux, N., J.W. Pomeroy, and **K.N. Musselman** (2014), Modelling windflow over the Canadian Rockies, poster presentation at the Canadian Geophysical Union Annual Meeting, Banff, Alberta.

Musselman, K.N. and J.W. Pomeroy (2014), Complexities in seasonal snowpack development, melt rates, and hydrological partitioning across a forest-gap continuum, oral presentation at the Canadian Geophysical Union Annual Meeting, Banff, Alberta.

Musselman, K.N., J.P. Pomeroy, N. Leroux, R. Essery (2013), Uncertainty in alpine snow mass balance simulations due to snow model parameterization and windflow representation, poster presentation at American Geophysical Union Annual Fall Meeting, San Francisco, California.

Musselman, K.N., J.P. Pomeroy, N. Leroux, R. Essery (2013), Simulating snow distribution and melt in alpine and forested terrain, oral presentation at the Davos Atmosphere and Cryosphere Assembly, Davos, Switzerland.

Musselman, K.N., J.P. Pomeroy, N. Leroux, R. Essery (2013), Evaluation of alpine snow processes simulated by snow and windflow models, oral presentation at the Canadian Geophysical Union, Saskatoon, Saskatchewan.

Musselman, K.N., S.A. Margulis, and N.P. Molotch (2012), Seasonal and inter-annual snowmelt patterns in the southern Sierra Nevada, California, invited oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., S.A. Margulis, and N.P. Molotch (2012), Integration of airborne LiDAR data and voxel-based ray tracing to determine high-resolution solar radiation dynamics at the forest floor: implications for improving stand-scale distributed snowmelt models, oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Molotch, N.P., **Musselman, K.N.**, P.B. Kirchner, R.C. Bales, and P.D. Brooks (2012), Effects of forest structure on snow accumulation and melt derived from ecohydrological instrument clusters across the Western US, invited poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Kirchner, P.B., R.C. Bales, **Musselman, K.N.**, and N.P. Molotch (2012), Under-canopy snow accumulation and ablation measured with airborne scanning LiDAR altimetry and in-situ instrumental measurements, southern Sierra Nevada, California, oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., N.P. Molotch, S.A. Margulis, P.B. Kirchner, and R.C. Bales (2011), Inter-annual snow accumulation and melt patterns in a sub-alpine mixed conifer forest: results from a distributed physically based snow model, poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Kirchner, P.B.; R.C. Bales, J. Flanagan, **K.N. Musselman**, and N.P. Molotch (2011), Mountain front precipitation accumulation over a 3300 m elevation gradient from scanning LiDAR snow depth and in-

situ instrumental measurements, southern Sierra Nevada, California, poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Molotch, N.P., E. Trujillo, and **K.N. Musselman** (2011), Vegetation-snowpack feedbacks from plot to regional scales, oral presentation at Western Snow Conference Annual Meeting, Stateline, NV.

Kirchner, P.B., R.C. Bales, R.R. Rice, **K.N. Musselman**, and N.P. Molotch (2011), Measuring and modeling under-canopy snow ablation in southern Sierra Nevada subalpine red-fir forest, oral presentation at Western Snow Conference Annual Meeting, Stateline, NV.

Molotch, N.P., **K.N. Musselman**, E. Trujillo, P.D. Brooks, J.R. McConnell, and M.W. Williams (2010), Ecohydrological response to snowmelt dynamics from plot to regional scales, invited oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., N.P. Molotch, S.A. Margulis, M. Lehning, P.B. Kirchner, and R.C. Bales (2010), Simulating plot-scale variability of snowpack states in conifer forests using hemispherical photography and a process based one-dimensional snow model, poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Perrot, D.O., N.P. Molotch, **K.N. Musselman**, and E.T. Pugh (2010), Modeling the effects of the mountain pine beetle on snowmelt rates in a subalpine forest, poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Kahl, A., A. Winstral, D. Marks, J. Dozier, and **K.N. Musselman** (2010), Heterogeneity of Snow Water Equivalent Derived from MODIS Imagery and the ISNOBAL Snowmelt Model, poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Kirchner, P.B., R.C. Bales, R. Rice, **K.N. Musselman**, and N.P. Molotch (2010), Estimating under-canopy ablation in a subalpine red-fir forest, southern Sierra Nevada, California, poster presented at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., N.P. Molotch, and S.A. Margulis (2010) A physically-based approach to improving estimates of snow states and fluxes in a conifer forest of Sequoia National Park, poster presented at Eastern Snow Conference, Hancock, MA.

Kirchner, P.B., R.C. Bales, **K.N. Musselman**, and N.P. Molotch (2009), Multi-scale observations and modeling of the snowpack in a forested Sierra Nevada catchment, oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., N.P. Molotch, S.A. Margulis, P.B. Kirchner, and R.C. Bales (2009), A mechanistic approach for estimating snowpack dynamics in a conifer forest, oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Margulis, S.A., C. Huang, **K.N. Musselman**, and M.T. Durand (2009), Examination of the implications of snow model complexity, stratigraphy, and grain-size representation on SWE estimation via passive microwave radiance data assimilation, invited oral presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., N.P. Molotch, and S.A. Margulis (2008), Spatial, Seasonal, and Interannual Variability of Snow Accumulation Control Mechanisms in two Neighboring Alpine and Sub-alpine Catchments in California's Seasonally Snow-covered Southern Sierra Nevada; poster presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Brooks, P.D., N.P. Molotch, **K.N. Musselman**, E. Small, J. McConnell, R. Bales, and A. Rinehart (2006), The effects of forest vegetation on snow accumulation, ablation, and meltwater routing, Valles Caldera National Preserve, NM, oral Presentation at American Geophysical Union Fall Meeting, San Francisco, CA.

Musselman, K.N., B. Wemple, P. Bierman, and J. Shanley (2003), Analysis of Spatial Variability of Precipitation and Snow Accumulation on Mount Mansfield, Stowe, Vermont, poster presentation at the American Geological Society Annual Meeting, Seattle, WA.

TEACHING AND MENTORING EXPERIENCE

CLASSROOM TEACHING EXPERIENCE

University of Colorado Boulder

Spring, 2025, GEOG 1011 – *Environmental Systems: Landscapes and Water*. Enrollment 154

Fall, 2024, GEOG 3511 – *Introduction to Hydrology*. Enrollment, 25

Fall, 2024, GEOG 1011 – *Environmental Systems: Landscapes and Water*. Enrollment 151

Spring, 2024, GEOG 1011 – *Environmental Systems: Landscapes and Water*. Enrollment 144

Fall, 2023, GEOG 3511 – *Introduction to Hydrology*. Enrollment, 28

Spring, 2023, GEOG 4321/5321 – *Snow Hydrology*. Enrollment, 23 (19 undergrads./ 4 grads.)

Spring, 2022, GEOG 4321/5321 – *Snow Hydrology*. Enrollment, 21 (14 undergrads./ 7 grads.)

Spring, 2019, GEOG 1011 – *Environmental Systems: Landscapes and Water*. Enrollment, 155

Fall, 2019, GEOG 1011 – *Environmental Systems: Landscapes and Water*. Enrollment, 156

University of California Los Angeles, Teaching Assistant (TA)

Fall, 2009, Civil Engineering 150, *Introduction to Hydrology*. Enrollment, 108

WORKSHOPS & FIELD COURSES TAUGHT

2024: Arctic Rivers Climate Change Workshop, 24 Attendees; Aniak, Alaska

2024: NASA Snow Science Community Meeting, 200 Attendees; Boulder, CO

2023: Ecosystem Resilience Project, Stakeholder Luncheon; 18 attendees

2022: Arctic Rivers Summit, 100 Attendees; 50% Indigenous

2020: UCB Science Discovery, Family Engineering Day; 1000+ attendees

2014: NSF-funded workshop LiDAR Applications in Critical Zone Sciences

2011: TA for *Advanced Field Methods in Snow Science*, CU Boulder

2006: TA for *Snow Hydrology and Field Camp*, Univ. of Arizona

ADDITIONAL TEACHING, MENTORING, AND ADVISING ACTIVITIES

2025: Science Mentor for New Meridian High School STEM school program

2025: Science Mentor for Earth Explorers STEM education middle school program

2024: Science Mentor for Earth Explorers STEM education middle school program

2023: Science Mentor for Earth Explorers STEM education middle school program

2020: Invited Speaker, Protect Our Winters Advocacy Volunteer Training, Carbondale, CO.

2020: Invited Lecturer, University of Vermont, Snow Hydrology Class

2019: Invited Lecturer, ATOC, Mountain Meteorology, CU Boulder.

2018: Invited Lecturer, ATOC, Mountain Meteorology, CU Boulder.

2017: Invited Lecture, Engineering Hydrology CVEN 4333, Dept. of Civil, Environmental & Architectural Engineering, University of Colorado, Boulder.

2015: Invited Lecturer: Canadian Society for Hydrological Sciences, Short Course Principles of Hydrology, University of Saskatchewan, Canadian Rockies, Alberta
2014: Invited Lecturer: Canadian Society for Hydrological Sciences, Short Course Principles of Hydrology, University of Saskatchewan, Canadian Rockies, Alberta
2013: Invited Lecturer, Ecology 413: Field Ecology, University of Calgary, Alberta, Canada
2013: Invited Lecturer, 4th-year Ecology course, University of Calgary, Alberta, Canada
2011: Invited Lecturer, Geography 1001: Climate and Vegetation, CU Boulder
2011: Invited Lecturer, Geography 5241: Advanced Field Methods, CU Boulder, Steamboat Springs, CO
2009: Invited Lecturer, Civil Engineering 150: Introduction to Hydrology, UCLA, Los Angeles, CA.

STUDENT AND POST-DOCTORAL MENTORSHIP

Postdoc Co-Advisor

Dr. Peyton Thomas

2024 – Chancellor’s Postdoctoral Fellow, ENVS, CU Boulder

2025 – Now Assistant Professor, ENVS, CU Boulder

Graduate Student Primary Advisor

Sydney Carr, Ph.D. Student, Geography, CU Boulder

Colin Gilbert, M.A. Student, Geography, CU Boulder

Graduate Student Co-Advisor

Alexis Blond, Visiting MS Student, Mathematics, Nice Polytechnic

Albane Challamel, Visiting MS Student, Mathematics, Nice Polytechnic

Nicolas Tarasewicz, Ph.D. Student, Geography, CU Boulder

Graduated Students

Dylan Blaskey, Ph.D. Student, Civil Engineering, CU Boulder

2025 – Now Assistant Professor at University of South Carolina

Ph.D. Committee Member

Michela Savignano, Geography, CU Boulder

Emma Tyrrell, Geography, CU Boulder

Kaitlyn Bishay, Civil Engineering, CU Boulder

Rahila Meribah Yilangai, Geography, CU Boulder

Christopher McNabb, Geography, CU Boulder

Millie Spencer, Geography, CU Boulder

[past]

Kehan Yang, Geography, CU Boulder

Hamideh Safa, University of Nevada, Reno

Katherine Hale, Geography, CU Boulder

John Bryan Curtis, Geography, CU Boulder

Master’s Committee Member

Virgil Alfred, Geography, CU Boulder

Jennifer Morse, Geography, CU Boulder

Theodore Kuhn, Geography, CU Boulder

[past]

Patrick Saylor, Geography, CU Boulder

Denise Mondragon, Geography, CU Boulder

Eric Kennedy, Geography, CU Boulder

Natasha Harvey, Geography, CU Boulder

Undergraduate Research Mentor

Ava Towle, Geography, CU Boulder

Liliana Wagner, EBIO, CU Boulder

Julia Ronci, ENVS, CU Boulder

[past mentees]

Jackson Parker, Geography, CU Boulder

Jada Gray, RECCS, CU Boulder

Siobhan Ciafone (Honor Thesis), Geography, CU Boulder

Ella Hall, CU Boulder

Allyson Fitts, CU Boulder

Kyla Elise Christopher-Moody, CU Boulder

Haley Nolde (REU), University of Nebraska, Lincoln

PROFESSIONAL AFFILIATIONS & SERVICE ACTIVITIES

CU Boulder Research & Innovation Office (RIO) Faculty Fellow – 2024

Proposal Reviewer

- NASA Terrestrial Hydrology
- NASA Applied Sciences Program
- NSF Office of Polar Programs
- NSF Hydrologic Sciences
- German Research Foundation

Journal Peer Reviewer

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| • Advances in Water Resources | • J. of Applied Met. and Climatology |
| • Agricultural and Forest Meteorology | • J. Advances Modeling Earth Systems |
| • Arctic, Antarctic, and Alpine Research | • JGR – Atmospheres |
| • Bulletin of the American Mete. Society | • Journal of Hydrology |
| • Earth Futures | • Journal of Hydrometeorology |
| • Earth System Science Data | • Nature Climate Change |
| • Ecohydrology | • Nature Communications |
| • Frontiers of Earth Science | • Nature Climate and Atmosphere |
| • Geophysical Research Letters | • Remote Sensing of Environment |
| • Hydrological Processes | • Science Advances |
| • Hydrology Research | • The Cryosphere |
| • iScience | • Water Resources Research |

Committee Memberships:

- Personnel Committee, INSTAAR, CU Boulder (AY 25/26)
- Personnel Committee, Geography Department, CU Boulder (AY 24/25)
- Executive Committee Member, INSTAAR, CU Boulder (AYs 22/23 & 23/24)
- Search Committee, Physical Geographer, Geography, CU Boulder (AY 23/24)
- Seminar Committee, INSTAAR (AY 23/24)

- . Computer and Website Committee, Geography Department, CU Boulder (AY 23/24)
- . Executive Board Member, Western Snow Conference
- . NOAA CMIP6 Climate Change Task Force (2019-2022)
- . Data Acquisition Round Table (DART) committee for the California Cooperative Snow Survey (CA DWR) (2017-2018)

Society Memberships

- . American Geophysical Union (2006-present)
- . Canadian Geophysical Union (2013-2015)
- . European Geophysical Union (2017)
- . American Meteorological Society (2017)
- . USGS Rocky Mountain Hydrologic Research Center
- . Sigma Gamma Epsilon Earth Sciences Honor Society
- . Changing Cold Regions Network