

## JOEL G. SINGLEY, PH.D.

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Pronouns: He/Him/His

### PROFESSIONAL INTERESTS

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I am an interdisciplinary critical zone scientist and educator who works on:

- interactions between hydrologic variability and the biogeochemical function of ecosystems
- factors governing ecosystem resilience across the terrestrial-aquatic interface
- improving science and data literacy, especially quantitative systems thinking and coding

### EDUCATION

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- Ph.D. Environmental Studies, University of Colorado Boulder** 2021  
Dissertation: *Stream Corridor Connectivity Controls on Nitrogen Cycling*  
Advisors: Dr. Eve-Lyn S. Hinckley and Dr. Michael N. Gooseff
- M.S. Environmental Studies, University of Colorado Boulder** 2017  
Thesis: *Nitrate Dynamics Under Unsteady and Intermittent Flow in an Antarctic Stream*  
Advisors: Dr. Eve-Lyn S. Hinckley and Dr. Michael N. Gooseff
- B.S. Science of Natural and Environmental Systems, Cornell University** 2010  
Honors: *Magna Cum Laude*  
Minors: Education; Inequality Studies; and International Studies

### APPOINTMENTS

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- Assistant Professor of Environmental Science** 2022–Present  
Department of Biology, Marine Biology, and Environmental Science  
Roger Williams University, Bristol, RI
- Postdoctoral Researcher** 2021–2022  
Department of Geology and Geological Engineering  
Colorado School of Mines, Golden, CO  
Supervisor: Dr. Kamini Singha
- Science Teacher** 2013–2015  
Hartford Memorial Middle School, White River Junction, VT
- Mathematics Intervention Teacher** 2011–2013  
Amherst Regional Middle School, Amherst, MA
- YouthServe AmeriCorps Member** 2010–2011  
Amherst Regional Middle School, Amherst, MA

### TEACHING

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#### Roger Williams University

- Earth Systems with Lab (ENVS 103) Fall 2022
- Environmental Data Science with Lab (ENVS 279) Spring 2023
- Biogeochemical Cycling (ENVS 310) Spring 2023

#### Colorado School of Mines

- Electrical and Electromagnetic Methods and Applications (Guest Lecturer) Spring 2022

University of Colorado Boulder

- Field Methods in Ecosystem Science (ENVS 4050) Fall 2015, 2020
- Physical Hydrology (CVEN 5333, Guest Lecturer) Fall 2017, 2018, 2020
- Stream Ecology (CVEN 5323, Guest Lecturer) Spring 2021
- Foundations of Environmental Leadership (ENVM 5001) Fall 2018
- Pedagogy for Future Faculty (ENVS 5100, Co-Instructor) Spring 2017
- General Biology Laboratory I (EBIO 1230) Fall 2015, 2016
- General Biology Laboratory II (EBIO 1240) Spring 2016, 2017
- Biology a Human Approach Laboratory (EBIO 1050) Spring 2015

**MENTORING**


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Stephen Gialamas, Undergraduate Field Research Assistant, Colorado School of Mines	2022
Isaac Fry, B.S. Student, Colorado School of Mines Project: <i>Developing an open-source code toolkit for analyzing high-frequency sap flow data</i>	2021–Present
Emmalynn Hicks, M.S. Student, Colorado School of Mines	2021–2022
Omowumi Erukubami, Geosciences Education & Mentorship Support Program	2021–2022
Emily Nelson, M.S. Student, Colorado School of Mines	2021
Gabrielle Dunn, Summer Program for Undergraduate Research (SPUR) CU Boulder Project: <i>Heat and water transport in soils underlain by permafrost</i>	2021
Fan Li, Graduate Student Peer Mentoring Program, CU Boulder	2020–2021
Lillian Jones, Undergraduate Field Research Assistant, CU Boulder	2019
Richa Manjari, Summer Research Intern, McMurdo Dry Valleys LTER Project: <i>Intra- and inter-annual flood recession patterns in the Onyx River, Antarctica</i>	2018

**HONORS**


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Best Student Talk, Hydrologic Sciences Symposium, University of Colorado Boulder	2021
Outstanding Student Presentation Award, American Geophysical Union	2019
Best Poster, Hydrologic Sciences Symposium, University of Colorado Boulder	2019
Poster Award (North America), Association of Polar and Early Career Scientists	2018
Best Should Teach Silver Award, Graduate Teacher Program, University of Colorado	2016
Outstanding Student Research Grant, Geological Society of America	2016
Pioneer Valley Excellence in Teaching Award, Harold Grinspoon Foundation	2012

**RESEARCH FUNDING AND FELLOWSHIPS**


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Beverly Sears Graduate Research Grant, University of Colorado Boulder (\$1,000) <i>Assessing seasonal changes in hyporheic exchange in a Colorado streambed</i>	2020
Environmental Studies Research Grant, University of Colorado Boulder (\$1,500) <i>Abiotic controls on the short-term availability of adsorbed nitrogen in an Antarctic stream.</i>	2019
Science Across Virtual Institutes International Fellowship, National CZO (\$5,400) <i>Analysis techniques for emerging high-frequency hydrochemical datasets.</i>	2016

Graduate Research Grant, Geological Society of America (\$2,332) 2016  
*Nitrate export controls in subalpine systems from seconds to seasons.*

Research Grant, American Alpine Club (\$500) 2016  
*Nitrate export controls in subalpine stream systems from seconds to seasons.*

#### PEER-REVIEWED PUBLICATIONS

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**Singley, J.G.**, K. Singha, M.N. Gooseff, A.S. Ward, R. González-Pinzón, T.P. Covino, J. Dorley, and E.S. Hinckley. Identification of hyporheic extent and functional zonation during seasonal streamflow recession by unsupervised clustering of time-lapse electrical resistivity models. *Hydrological Processes*, 36(10), e14713. DOI: [10.1002/hyp.14713](https://doi.org/10.1002/hyp.14713)

Zdasiuk, B.J., C.Y. Chen, S.D. McCormick, K.H. Nislow, **J.G. Singley**, and J.T. Kelly. Evaluating acid-aluminum stress in streams of the Northeastern U.S. at watershed, fish community and physiological scales. *Ecological Indicators*, 144. DOI: [10.1016/j.ecolind.2022.109480](https://doi.org/10.1016/j.ecolind.2022.109480)

Hensley, R.T., **J.G. Singley** and M.N. Gooseff. Pulses within Pulses: Concentration-discharge relationships across temporal scales in a snowmelt-dominated Rocky Mountain catchment. *Hydrological Processes*, 36(9), e14700. DOI: [10.1002/hyp.14700](https://doi.org/10.1002/hyp.14700)

González-Pinzón, R., J. Dorley, **J.G. Singley**, K. Singha, M.N. Gooseff, and T.P. Covino (2022). TIPT: The Tracer Injection Planning Tool. *Environmental Modeling and Software*, 156. DOI: [10.1016/j.envsoft.2022.105504](https://doi.org/10.1016/j.envsoft.2022.105504)

#### Published Prior to Appointment at RWU

Fortner, S.K., C. Manduca, H.N. Ali, C.M. Saup, S.C. Nyarko, S. Othus-Gault, V. Perera, V.C.H. Tong, A. Gold, T. Furman, L. Arthurs, B. Mulvey, K. St. John, **J.G. Singley**, E.T. Johnson, M. Witter, R. Batchelor, D. Carter, M.C. Damas, L. Lemay, K. Layou, R. Low, H. Wang, K. Olson-Sawyer, A. Pallant, K. Ryker, L. Lukes, N. LaDue, and K. van der Hoeven Kraft (2022). Geoscience Education Perspectives on Integrated, Coordinated, Open, Networked (ICON) Science. *Earth and Space Science*, 9, e2022EA002298. DOI: [10.1029/2022EA002298](https://doi.org/10.1029/2022EA002298)

**Singley, J.G.**, M.N. Gooseff, D.M. McKnight, and E.S. Hinckley (2021). The role of hyporheic connectivity in determining nitrogen availability: Insights from an intermittent Antarctic stream, *Journal of Geophysical Research: Biogeosciences*, 126, e2021JG006309. DOI: [10.1029/2021JG006309](https://doi.org/10.1029/2021JG006309)

Heindel, R.C., J.P. Darling, **J.G. Singley**, A.J. Bergstrom, D.M. McKnight, K.A. Welch, B. Lukkari, and M.N. Gooseff (2021). Diatoms trace organic matter retention and processing in hyporheic sediments in the McMurdo Dry Valleys, Antarctica. *Journal of Geophysical Research: Biogeosciences*, 126, e2020JG006097. DOI: [10.1029/2020JG006097](https://doi.org/10.1029/2020JG006097)

Bergstrom, A.J., M.N. Gooseff, **J.G. Singley**, M.J. Cohen, and K.A. Welch (2020). Nutrient uptake in the supraglacial stream network of an Antarctic glacier. *Journal of Geophysical Research: Biogeosciences*, 125, e2020JG005679. DOI: [10.1029/2020JG005679](https://doi.org/10.1029/2020JG005679)

**Singley, J.G.**, A.N. Wlostowski, A.J. Bergstrom, E.R. Sokol, C.L. Torrens, C. Jaros, C.E. Wilson, P.J. Hendrickson, and M.N. Gooseff (2017). Characterizing hyporheic exchange processes using high-frequency electrical conductivity-discharge relationships on sub-hourly to interannual timescales. *Water Resources Research*, 53(5), 4124-4141. DOI: [10.1002/2016WR019739](https://doi.org/10.1002/2016WR019739)

**MANUSCRIPTS IN REVIEW**

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**Singley, J.G.**, M.N. Gooseff, M.R. Salvatore, D.M. McKnight, and E.S. Hinckley. Differentiating physical and biological storage of nitrogen along an intermittent Antarctic stream corridor. Submitted to *Freshwater Science*.

**Singley, J.G.**, M. Briggs, B. Hoagland, R. Lauer, J. Meeks, A.B. Regberg, D. Rey, K. Swift Bird, and A.S. Ward. Celebrating the contributions of Kamini Singha as a mentor, researcher, and community leader in hydrologic science. Submitted to the *Journal of Hydrology* special issue on “Women in Hydrology: Celebrating the contributions of mentors, researchers, and leaders”.

**PUBLISHED DATASETS AND CODE**

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**Singley, J.G.** (2022). Example R scripts for unsupervised clustering of time-lapse electrical resistivity models from stream tracer injections. *Zenodo*. DOI: [10.5281/zenodo.6945970](https://doi.org/10.5281/zenodo.6945970)

**Singley, J.G.** (2022). Monte Carlo-based estimation of stream corridor nitrogen storage and annual fluxes for Von Guerard Stream, Antarctica (R script and pre-formatted data). *Zenodo*. DOI: [10.5281/zenodo.6049121](https://doi.org/10.5281/zenodo.6049121)

**Singley, J.G.**, M.N. Gooseff, and E.S. Hinckley (2021). Ammonium desorption of hyporheic sediments from Von Guerard Stream, McMurdo Dry Valleys, Antarctica (January 2019). *Environmental Data Initiative*. DOI: [10.6073/pasta/89e07484a91d8b503ae19d772555fbb4](https://doi.org/10.6073/pasta/89e07484a91d8b503ae19d772555fbb4)

**Singley, J.G.**, M.N. Gooseff, D.M. McKnight, and E.S. Hinckley (2021). Surface and hyporheic porewater chemistry and sediment nitrification potentials in Von Guerard Stream, McMurdo Dry Valleys, Antarctica (2018-2020). *Environmental Data Initiative*. DOI: [10.6073/pasta/d6e4301bf93fba0fef6fd5c33a092aaf](https://doi.org/10.6073/pasta/d6e4301bf93fba0fef6fd5c33a092aaf)

Heindel, R.C., **J.G. Singley**, A.J. Bergstrom, J.P. Darling, K.A. Welch, D.M. McKnight, and M.N. Gooseff (2020). McMurdo Dry Valleys LTER: Hyporheic sediment characteristics from transects across Von Guerard Stream, Taylor Valley, Antarctica, January 2019. *Environmental Data Initiative*. DOI: [10.6073/pasta/9e8dfbcaa6bba367d162eb6dede2937b](https://doi.org/10.6073/pasta/9e8dfbcaa6bba367d162eb6dede2937b)

Darling, J.P, R.C. Heindel, **J.G. Singley**, A.J. Bergstrom, and D.M. McKnight (2020). McMurdo Dry Valleys LTER: Hyporheic diatom community assemblages from transects across Von Guerard Stream, Taylor Valley, Antarctica, January 2019. *Environmental Data Initiative*. DOI: [10.6073/pasta/f79bdbca0e3e97ef5f1b4007d2f008eb](https://doi.org/10.6073/pasta/f79bdbca0e3e97ef5f1b4007d2f008eb)

**SEMINARS AND CONFERENCE PRESENTATIONS**

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<sup>G</sup>General Audience

\*Undergraduate mentee

+Graduate mentee

Invited Talks

**Singley, J.G.** Multi-dataset approaches to investigating ecosystem function and resilience amidst hydrologic variability. College of Science and Mathematics, James Madison University, Harrisonburg, VA, 12 April 2022.

**Singley, J.G.** Buried Treasure: Lessons about Nitrogen cycling from Antarctic Streams. Department of Biology, Marine Biology, and Environmental Science, Roger Williams University, Bristol, RI, 6 April 2022.

**Singley, J.G.** Physical Controls on ecosystem function and resilience under hydrologic variability. Geosciences Colloquium Series, Department of Geosciences, The Pennsylvania State University, State College, PA, 31 March 2022.

**Singley, J.G.** Deluge to Drought: Physical controls on ecosystem function and resilience under hydrologic variability. Department of Geology, Occidental College, Eagle Rock, CA, 25 February 2022.

**Singley, J.G.** Linking land use and land cover to surface water-groundwater interactions. Department Seminar, Department of Ecosystem Science and Sustainability, Colorado State University, Fort Collins, CO, 6 December 2021.

<sup>G</sup>**Singley, J.G.** Streams in a polar desert? Lessons from the McMurdo Dry Valleys, Antarctica. Science in the Virtual Pub, Museum of the Earth and The Paleontological Research Institute, Ithaca, NY, 29 July 2021.

**Singley, J.G.** Stream corridor processes explain variability in chemostasis between weathering solutes and nutrients across Antarctic streams. Natural Resource Ecology Laboratory Seminar Series, Colorado State University, 2 April 2021.

**Singley, J.G.,** M.N. Gooseff, K. Singha, and E.S. Hinckley. Delimiting and quantifying seasonal changes in hyporheic extent using inverted electrical resistivity data. American Geophysical Union, Fall Meeting (Virtual), 1–17 December 2020.

<sup>G</sup>**Singley, J.G.** Spiraling Downstream - How microbes grapple for Nitrogen in an Antarctic Stream. Antarctic Lecture Series, Colorado State University, Fort Collins, CO, 17 September 2019.

*Conference Presentations and Posters*

**Singley, J.G.,** \*I.C. Fry, L.L. Jacobsen, and K. Singha. Quantifying and comparing evapotranspiration dynamics using temporal moment analysis of sap flow time series. American Geophysical Union, Fall Meeting, Chicago, 12–16 December 2022. (Poster)

Hensley, R.T., **J.G. Singley,** and M.N. Gooseff. High-frequency sensors reveal variable concentration-discharge relationships across temporal scales in a snowmelt-dominated Rocky Mountain catchment. American Geophysical Union, Fall Meeting, Chicago, 12–16 December 2022. (Talk)

<sup>+</sup>Hicks, E., **J.G. Singley,** J. Shragge, and K. Singha. Analysis of seismic refraction and evapotranspiration to quantify water storage patterns and tree productivity at Gorden Gulch in Boulder, CO. Geology and Geological Engineer Student Research Fair, Colorado School of Mines, 3 March 2022. (Poster, Student Award)

**Singley, J.G.,** M.N. Gooseff, M.R. Salvatore, D.M. McKnight, and E.S. Hinckley. Physical and biological storage of nitrogen along an entire intermittent stream corridor. American Geophysical Union, Fall Meeting, New Orleans, 13–17 December 2021. (Poster)

**Singley, J.G.,** M.N. Gooseff, D.M. McKnight, and E.S. Hinckley. Can stream corridor processes alone sustain nutrient chemostasis? American Geophysical Union, Fall Meeting, New Orleans, 13–17 December 2021. (Talk)

Bergstrom, A.J., A.T. Wright, **J.G. Singley**, and M.N. Gooseff. What is a watershed? Shifting perspectives from long-term research in the McMurdo Dry Valleys, Antarctica. American Geophysical Union, Fall Meeting, New Orleans, 13–17 December 2021. (Invited Talk)

Gooseff, M.N., D.M. McKnight, **J.G. Singley**, and C.L. Torrens. The importance of river corridors to stream biogeochemical cycling – lessons from glacial meltwater streams in Antarctica. American Geophysical Union, Fall Meeting, New Orleans, 13–17 December 2021. (Talk)

Wright, A.T., M.N. Gooseff, A.J. Bergstrom, R.C. Heindel, and **J.G. Singley**. Persistent snow patch hydrologic contributions to Antarctic polar desert streams. American Geophysical Union, Fall Meeting, New Orleans, 13–17 December 2021. (Poster)

**Singley, J.G.** Rethinking the Fate of Nitrogen in MDV Streams. Summer Science Meeting, McMurdo Long-Term Ecological Research Project, 4–5 August 2021. (Talk)

Hensley, R.T., **J.G. Singley**, and M.N. Gooseff. Nutrient and carbon dynamics of snowmelt pulses in Rocky Mountain streams. Society for Freshwater Science, Annual Meeting, 23–27 May 2021. (Talk)

**Singley, J.G.** Source or sink? The role of hyporheic connectivity in autochthonous nitrogen cycling. Hydrologic Sciences and Water Resources Engineering Seminar Series, University of Colorado Boulder, 21 April 2021. (Talk)

**Singley, J.G.** Why does variability in chemostatic concentration-discharge relationships differ systematically between solutes in Antarctic streams? Hydrologic Sciences Symposium, University of Colorado Boulder, 8 April 2021. (Talk)

Emanuelson, K., T.P. Covino, J.R. Dorley, **J.G. Singley**, R. González-Pinzón, M.N. Gooseff, K. Singha. Evaluating variation in hydrologic transport in steep-forested and low gradient agricultural streams. American Geophysical Union Fall Meeting (Virtual), 1–17 December 2020. (Poster)

**Singley, J.G.**, M.N. Gooseff, D.M. McKnight, and E.S. Hinckley. The role of hyporheic connectivity in determining nitrogen availability. McMurdo Long-Term Ecological Research Project, Summer Science Meeting, 27–28 July 2020. (Talk)

**Singley, J.G.**, M.N. Gooseff, K. Singha, and E.S. Hinckley. Delimiting hyporheic area and sub-compartments using electrical resistivity inversions and time series clustering algorithms. American Geophysical Union, Fall Meeting, San Francisco, CA, 9–13 December 2019. (Talk)

Heindel, R.C., A.J. Bergstrom, **J.G. Singley**, D.M. McKnight, J.P. Darling, B. Lukkari, K.A. Welch, and M.N. Gooseff. Diatoms trace the retention and processing of organic matter in hyporheic sediments in the McMurdo Dry Valleys, Antarctica. American Geophysical Union, Fall Meeting, San Francisco, CA, 9–13 December 2019. (Talk)

Bergstrom, A.J., M.N. Gooseff, **J.G. Singley**, and M.J. Cohen. A new application of tracer-based methods to quantify nutrient uptake in the supraglacial drainage network of a cold-based Antarctic glacier. American Geophysical Union, Fall Meeting, San Francisco, CA, 9–13 December 2019. (Talk)

Dorley, J.R., R. González-Pinzón, **J.G. Singley**, K. Emanuelson, T.P. Covino, K. Singha, and M.N. Gooseff. Estimating metabolic responses to carbon, nitrogen and phosphorous additions in

different stream compartments. American Geophysical Union, Fall Meeting, San Francisco, CA, 9-13 December 2019. (Poster)

**Singley, J.G.**, M.N. Gooseff, and E.S. Hinckley. Short-term Nitrogen cycling in an ephemeral glacial meltwater stream, Antarctica. University of Colorado Boulder, Hydrologic Sciences Symposium, Boulder, CO, 11-12 March 2019. (Poster)

\*Manjari, R., **J.G. Singley**, A.J. Bergstrom, M.N. Gooseff, and E.S. Hinckley. Assessing changes in hyporheic storage from over two decades of diel flood recessions in Antarctic streams. American Geophysical Union, Fall Meeting, Washington D.C., 10-14 December 2018. (Poster)

**Singley, J.G.**, M.N. Gooseff, and E.S. Hinckley. Short-term Nitrogen cycling in an ephemeral glacial meltwater stream, Antarctica. American Geophysical Union, Fall Meeting, Washington D.C., 10-14 December 2018. (Poster)

**Singley, J.G.**, M.N. Gooseff, and E.S. Hinckley. Sub-daily biogeochemical cycling in sediment of an ephemeral meltwater stream. Scientific Committee on Antarctic Research, POLAR2018 Open Science Conference, Davos, Switzerland, 15-26 June 2018. (Poster)

**Singley, J.G.**, E.S. Hinckley, and M.N. Gooseff. Nitrate dynamics under unsteady and intermittent sub-daily discharge in an Antarctic glacial meltwater stream. Gordon Research Seminar and Conference on Catchment Science, Lewiston, ME, 24-30 June 2017. (Talk and Poster)

**Singley, J.G.**, A.N. Wlostowski, A.J. Bergstrom, E. Sokol, C.L. Torrens, C. Jaros, P.J. Hendrickson, and M.N. Gooseff. Characterizing the role of hyporheic exchange processes in transient electrical conductivity-discharge relationships over multiple timescales. American Water Resources Association, Specialty Conference on Hydrologic Connectivity, Snowbird, UT, 2 May 2017. (Talk)

**Singley, J.G.**, A.N. Wlostowski, A.J. Bergstrom, E. Sokol, C.L. Torrens, C. Jaros, P.J. Hendrickson, and M.N. Gooseff. Long-term, high-frequency observations reveal shifts in C-Q dynamics in McMurdo Dry Valley Streams. Geological Society of America, Annual Meeting, Denver, CO, 26 September 2016. (Talk)

## PROFESSIONAL SERVICE

Member, Water Quality Technical Committee, American Geophysical Union	2022–Present
Session Convener, <i>Frontiers in water-quality science: origins, patterns, and detection of spatial and temporal variation</i> . American Geophysical Union, Fall Meeting, Chicago, IL	2022
Session Co-convener, <i>Flooded with ideas on dry rivers: hydro-biogeochemistry of intermittent freshwater Systems</i> . Joint Aquatic Sciences Meeting, Grand Rapids, MI	2022
Ambassador, <a href="#">Local Science Partners</a> , American Geophysical Union	2022
Volunteer Scientist, <a href="#">Earth Explorers</a> Outreach Program	2022
Mentor, Geosciences Education & Mentorship Support Program ( <a href="#">GEMS</a> )	2021–2022
Expert Reviewer, Second Order Draft Working Group II Sixth Assessment Report (SOD-WGII-AR6), Intergovernmental Panel on Climate Change	2021
Judge, Outstanding Student Presentation Award, American Geophysical Union	2021

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Member, Advocacy Committee, National Association of Geoscience Teachers	2020–Present
Member, Justice, Equity, Diversity, and Inclusion Task Force, Institute of Arctic and Alpine Research, University of Colorado Boulder	2020–2021
Peer Mentor, Graduate School, University of Colorado Boulder	2020–2021
Council Member, Association of Polar Early Career Scientists	2020–2021
Member, Western Coalition for Science Policy	2020–2021
Participant, Climate Change Virtual Advocacy Days, American Geophysical Union	2020
Chair and Student Member-at-Large, Professional Development Committee, Geological Society of America	2019–2022
Member, Student Advisory Council, Geological Society of America	2019–2022
Activity Leader, Open House for Middle School Students, Institute of Arctic and Alpine Research	2017–2019
Graduate Assistant, <a href="#">TRESTLE</a> Grant for <i>Quantitative Analysis and Critical Thinking for the Environmental Studies Major</i> , University of Colorado Boulder	2017–2019
<a href="#">Lead Graduate Teacher</a> , Center for Teaching & Learning, University of Colorado Boulder	2016–2017
Mentor to Preservice Teachers, Upper Valley Educators Institute, Lebanon, NH	2014–2015
Reviewer: <i>Environmental Research Letters</i> , <i>Geografiska Annaler (Series A)</i> , <i>Journal of the American Water Resources Association</i> , <i>Limnology and Oceanography</i> , National Science Foundation - Hydrologic Sciences Program, <i>Science of the Total Environment</i> , <i>Vadose Zone Journal</i> , <i>Water Resources Research</i>	2016–Present