

# Rebecca Orrison, Ph.D.

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## EDUCATION

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### Ph.D., Atmospheric Science

2024

University at Albany; State University of New York

Dissertation: *Stable oxygen isotope variability as a proxy for large-scale dynamics of the South American Summer Monsoon*

Advisor: Dr. Mathias Vuille

### B.S., Environmental Science, Policy and Management

2016

Minor: *Climatology*

University of Minnesota – Twin Cities

## RESEARCH EXPERIENCE

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### Graduate Research Assistant

9/2018 – 7/2024

*Research Foundation for SUNY at the University at Albany; New York*

- Synthesized diverse data from large-scale climate models, observations, and reanalysis products to develop an emergent understanding of the historic and modern climate variability of the South American Summer Monsoon.
- Developed statistical analysis to characterize the regional atmospheric circulation response to external and internal forcing mechanisms of the global climate system in the past, present, and future.
- Presented research findings in numerous first- and co-authored peer-reviewed publications, professional talks, and conference presentations. Full list available on professional website.
- Participated in diverse outreach activities including as a mentor and instructor for education activities designed to engage students from backgrounds under-represented in STEM and gave numerous public talks on climate change for diverse community groups.

### Visiting Research Scientist

9/2017 – 12/2017

*Climate Dynamics Group, Max Planck Institute for Meteorology; Hamburg, Germany*

- Compared the ocean-atmosphere Bjerknes feedback strength in reanalyses and observations across multiple data sets (surface and L3 satellite observational products) with estimates in current literature derived from CMIP5 model simulations.

### Undergraduate Research Assistant

6/2014 – 10/2016

*Dept of Soil, Water and Climate, University of Minnesota; Minnesota*

- Evaluated the North American hydroclimate response to seasonal ocean-atmosphere interactions in the Pacific and Atlantic ocean basins in CESM simulations using reanalysis datasets.

## COMMUNITY ORGANIZING EXPERIENCE

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### Chair

1/2021 – 1/2023

*Capital District Public Power Working Group*

*Democratic Socialists of America, Public Power NY Coalition; Albany, NY*

- Steering member and sole climate scientist of a strategic statewide campaign to fight for renewable energy, high-paying jobs, and environmental justice through the expansion of public power in the state of New York, and to pass the New York Build Public Renewables Act. [passed in 2022-2023 session]
- Built deep relationships with key stakeholders, including organized labor, elected officials, and social justice organizations.
- Coordinated recruitment and training to support a local team of activists engaged in the statewide effort, including coordination of local actions, written communications (press releases and articles), delegating organizing conversations with new member recruits, and media strategy.

- Maintained multi-modal (phone calls, slack, email) and frequent communication within our local team through documenting and facilitating meetings, maintaining working plans and training team members to help with project management and step into leadership.
- Planned seven legislative lobbying days in 2020–2021 legislative session and a regionally coordinated rally (June 2021).

### Co-convenor

4/2018 – 12/2021

*Climate Change Working Group  
Science for the People*

- Facilitated national working group meetings across various member chapters.
- Developed a campaign for a “People’s Green New Deal” to combat the climate crisis with widespread democratic input, including support for events across the United States and the development of materials and resources for local efforts.
- Member of publication collective for the Science for the People Magazine ‘People’s Green New Deal’ issue (coordinator, contributor, reviewer, translator). Continued assistance in translation and technical editing for subsequent publications.
- Coordinated a series of seven virtual workshops on a ‘People’s Green New Deal’ for an international audience, reaching more than 500 participants. Themes of the workshop related to the intersection of climate change and social justice with themes such as labor, agriculture, energy, and internationalism.
- Organized a workshop to engage geoscientists in ongoing Science for the People activities and the work of allied organizations.

### Organizer

11/2019

*Climate, Food Systems, and Social Justice*

- Organized and facilitated a community workshop with over 80 attendees to create emergent dialog at the intersection of the issues of climate, food systems, and social justice.
- Planned a detailed workshop outline, including a Q & A with a panel of featured speakers (both local and invited from outside the community), facilitated small group discussions with guiding questions, and planned a concluding synthesis discussion.

## PUBLICATIONS

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Lyu, Z., Vuille, M., Goose, H., **Orrison, R.**, Novello, V. F., Cruz, F. W., Strikis, N., Cauhy, J., (2024), South American monsoon intensification during the last millennium driven by joint Pacific and Atlantic forcing, *Science Advances*, 10(38), eado9543. <https://doi.org/10.1126/sciadv.ado9543>

**Orrison, R.**, Vuille, M., Cauhy Rodrigues, J., Strikis, N., Cruz, F., Andreu-Hayles, L., Rodriguez-Caton, M., (2024), Pacific Interannual and Multidecadal Variability Recorded in  $\delta^{18}O$  of South American Monsoon Precipitation, *Journal of Geophysical Research: Atmospheres*, 129(17). e2024JD040999. <https://doi.org/10.1029/2024JD040999>

**Orrison, R.**, (2024), Pacific influence on d18o in South American Monsoon precipitation, Zenodo [Software]. <https://doi.org/10.5281/zenodo.11212407>

**Orrison, R.**, Vuille, M., Smerdon, J. E., Apaéstegui, J., Azevedo, V., Campos, J. P. S., Cruz, F. W., Della Libera, M. E. and Strikis, N. M., (2022), South American Summer Monsoon Variability over the Last Millennium in Paleoclimate Records and Isotope-enabled Climate Models, *Climate of the Past*, 18, 2045–2062. <https://doi.org/10.5194/cp-18-2045-2022>.

**Orrison, R.**, Vuille, M., Smerdon, J. E., Apaéstegui, J., Azevedo, V., Campos, J. L. P. S., Cruz, F., W., Della Libera, M. E. and Strikis, N. M., (2022), Last Millennium  $\delta^{18}O$ ,  $\delta^{13}C$  and U/Th ages of MV1 and MV30 stalagmite records from Mata Virgem cave (central Brazil). PANGAEA. <https://doi.org/10.1594/PANGAEA.948183>

**Orrison, R.**, (2022), SASM-MCEOF-v1.1.0, Zenodo [code, data set]. <https://doi.org/10.5281/zenodo.6949234>

Della Libera, M.E., Novello, V.F., Cruz, F.W., **Orrison, R.**, Vuille, M., Maezumi, S.Y., de Souza, J., Rodriguez, J.C., Campos, J.L.P.S., Ampuero, A., Utida, G., Strikis, N.M., Fernandes Stumpf, C., Azevedo, V., Zhang, H., Edwards, R.L. and Cheng H. (2022), Paleoclimatic and paleoenvironmental changes in Amazonian lowlands over the last three millennia and their implications for pre-Columbian populations. *Quaternary Sciences Reviews*, 279, 107383. <https://doi.org/10.1016/j.quascirev.2022.107383>

## SELECTED PRESENTATIONS

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**Orrison, R.**, Vuille, M., (2023), Pacific Modulation of South American Monsoon  $\delta^{18}O$  in the Last Century. *American Geophysical Union Fall Meeting, San Francisco, CA*. [poster]

**Orrison, R.**, Vuille, M., (2023), Modulation of South American Hydroclimate by Pacific Sea Surface Temperatures on High- and Low-frequency Timescales. *Smerdon Climate Lab; Lamont-Doherty Earth Observatory, Palisades, NY* [invited, oral]

**Orrison, R.**, Vuille, M., (2022), Internal and External Drivers of South American Summer Monsoon Variability During the Current Warm Period. *American Geophysical Union Fall Meeting, Chicago, IL*. [poster]

**Orrison, R.**, Vuille, M., (2022), Last Millennium Trends in South American Summer Monsoon Variability Captured in Proxy Records and Isotope-enabled Climate Models. *Climate Change: The Karst Record IX (KR9); Innsbruck, AT*. [poster]

**Orrison, R.**, Vuille, M., Smerdon, J., Cruz, F. W., (2021). South American Monsoon Variability Over the Last Millennium Captured by Oxygen Isotope Paleorecords and Isotope-enabled Models. *American Geophysical Union Fall Meeting, New Orleans, LA*. [oral]

**Orrison, R.**, Vuille, M., (2021). Mechanisms of South American Monsoon System response to external variability over the last millennium; *Geological Society of London, Climate change in the geological record; virtual*. [oral – ECR flash talk]

**Orrison, R.**, Vuille, M., (2020). Intercomparison of proxy data and model simulations as key to understanding internal variability of the South American Monsoon System. *American Geophysical Union Fall Meeting; virtual*. [poster]

Skott, C. M., **Orrison, R.**, (2020). Reaching out to Policy Makers in the PIRE context. *PIRE-CREATE Annual Meeting; virtual*. [oral]

**Orrison, R.**, Vuille, M., (2020). Dynamical Drivers of South American Monsoon Variability over the Last Millennium, PP003-0013 *American Geophysical Union Fall Meeting; San Francisco, CA*. [poster]

**Orrison, R.**, Vuille, M., (2019). Spatio-temporal variability of the South American Monsoon over the past millennium. *Graduate Climate Conference, Woods Hole, MA*. [poster]

**Orrison, R.**, Vuille, M., (2019). Intercomparison of proxy data and model simulations as key to understanding internal variability of the South American Monsoon System. *US CLIVAR Water Isotopes and Climate Workshop, Boulder, CO*. [poster]

## SELECTED SERVICE

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<b>Climate Group Organizer</b> , DAES, UAlbany	2022 – 2024
<b>Student Member</b> , AMS Energy Committee	2022 – 2023
<b>Mentor</b> , DAES, UAlbany Graduate Mentorship Program	2019 – 2024
<b>Early Career Convener</b> , AGU Fall Meeting	2023
<b>Volunteer</b> , STEM Enrollment Research Project, Inclusion and Diversity Committee, DAES, UAlbany	2022
<b>Member</b> , PAGES 2k ENSO/Monsoon Working Group	2022 – 2023
<b>Early Career Convener</b> , AGU Fall Meeting	2022
<b>Graduate Student Representative</b> , DAES Graduate Program Committee, UAlbany	2020 – 2022
<b>Student Representative</b> , DAES Program Review, UAlbany	Spring 2021

<b>President</b> , DAES Graduate Student Organization, UAlbany	2019 – 2020
<b>Member</b> , DAES Graduate Handbook policy update committee, UAlbany	Fall 2018

## SELECTED COMMUNITY ENGAGEMENT AND OUTREACH

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<b>Interviewee</b> , Climate Change Collaborations Across the Americas, AGU TV	2023
<b>Presenter</b> , Public talk: Climate Change and Us; Beyond Individual Action; Wilkes-Barre, PA	2022
<b>Presenter</b> , Public talk: Climate Change and Us; Beyond Individual Action; Albany, NY	2022
<b>Panelist</b> , COP 26 Panel; UAlbany Democracy Matters Club	2022
<b>Volunteer</b> , Girls Inc., Eureka! summer camp; DAES, UAlbany	2021
<b>Volunteer</b> , UAlbany Science and Technology Entry Program; DAES, Albany, NY	2020
<b>Volunteer</b> , Earth Science Teacher workshop; DAES, Albany, NY	2020
<b>Presenter</b> , Poster session and discussion with Congressman Paul Tonko; DAES, Albany, NY	2019
<b>Volunteer</b> , Earth Science Teacher workshop; DAES, Albany, NY	2019
<b>Volunteer</b> , Girls Inc., Eureka! summer camp; DAES, UAlbany	2019
<b>Panelist</b> , Environmental Science Career Day; Coxsackie-Athens School District, Hudson, NY	2019
<b>Narrator</b> , English voice-over for <i>Chasing Traces from the Past</i> Documentary	2019

## AWARDS, FUNDING

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<b>Travel Support</b> , Climate Change, The Karst Record (KR9 Conference) (\$830)	2022
<b>Distinguished Service Award</b> , DAES, UAlbany (\$200)	2020
<b>AMS Science Policy Colloquium Support</b> , National Science Foundation (\$5300)	2020
<b>Excellence at the Intersection of Science and Life Essay Competition</b> , Women in Health and Science Committee, UAlbany (\$50)	2020
<b>Travel Support</b> , US CLIVAR Water Isotopes and Climate Workshop (\$1,000)	2019
<b>PyCon Scholarship</b> , Python Software Foundation (\$700)	2015
<b>Undergraduate Research Opportunities Program Award</b> , University of Minnesota (\$1,400)	2014
<b>Charles and Myrtle Stroud Scholarship</b> , University of Minnesota (\$3,000)	2013

## TRAINING INTENSIVES

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<b>Climate Reality Project Leadership Corp</b>	October 2024
<b>Summer School on Speleothem Science Innsbruck, AT</b>	July 2022
<b>American Meteorological Society Summer Policy Colloquium</b>	Summer 2020
<b>PIRE-CREATE Summer School São Paulo, Brazil</b>	July 2019

## SKILLS

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<b>Technical</b>	observational data (.txt), large-scale climate data (netCDF), statistics, data visualization, shell/bash scripting
<b>Programming</b>	Python, Climate Data Operators (CDO), Git, UNIX, high-performance parallelized computing, L <sup>A</sup> T <sub>E</sub> X
<b>Software</b>	Asana, Airtable, Zenodo, Zotero
<b>Languages</b>	English (native), Spanish (fluent), French (proficient)

## PROFESSIONAL AFFILIATIONS

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American Meteorological Society (AMS)	2018 – present
American Association for the Advancement of Science (AAAS)	2018 – present
American Geophysical Union (AGU)	2018 – present