Rebecca Orrison

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Objective

I am a climate scientist interested in solutions-oriented science that integrates my experience as a researcher and community organizer with my passion for science and justice.

Education

University at Albany; State University of New York
Ph.D.; Atmospheric Science — July 2024
Dissertation: *Stable oxygen isotope variability as a proxy for large-scale dynamics of the South American Summer Monsoon*
Advisor: Dr. Mathias Vuille

University of Minnesota – Twin Cities
B.Sc.; Environmental Science, Policy and Management — May 2016
Emphasis: *Earth Systems and Atmospheric Science* Minor: *Climatology*

Research Experience

Graduate Research Assistant — 9/2018 – 7/2024
Research Foundation for SUNY at the University at Albany; New York
Supervisor: Dr. Mathias Vuille

- Investigating the character and sensitivity of South American Monsoon System hydroclimate variability during the last millennium using oxygen isotope proxies and isotope-enabled climate models with variable forcing conditions (iCESM - LME).
- Characterizing the signal of interannual and multi-decadal Pacific Ocean modes in South American oxygen isotope hydroclimate variability using terrestrial records and and isotope-enabled climate models (CAM5).
- Measuring the fingerprint of regional Hadley circulation change linked to trends in South American oxygen isotopes in terrestrial archives and isotope-enabled climate models (CESM2-iCAM5).
- Instructor for education activities integral to engaging students from backgrounds under-represented in STEM as a mentor and instructor. Funded by NSF-Project for International Research and Education (PIRE) OISE-1743738.

Visiting Research Scientist — 9/2017 – 12/2017
Climate Dynamics Group, Max Planck Insitute for Meteorology; Hamburg, Germany
Supervisor: Dr. Thorsten Mauritsen

- Compared the Bjerknes feedback strength in reanalyses and observations across multiple data sets (surface and satellite) 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
Supervisors: Dr. Peter Snyder, Dr. Stefan Liess

- 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

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.
- Maintainted multi-modal (phone calls, slack, email) and freqeunt 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 and coordinated with allied organizations
- 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), faciliated small group discussions with guiding questions, and planned a concluding synthesis discussion.

Publications

Lyu, Z., Vuille, M., Goosse, H., **Orrison, R.**, Novello, V. F., Cruz, F. W., Stríkis, 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., Stríkis, 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 Stríkis, 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 Stríkis, 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

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

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

Early Career Convener, AGU Fall Meeting 2022
Graduate Student Representative, DAES Graduate Program Committee, UAlbany 2020 – 2022
Student Representative, DAES Program Review, UAlbany Spring 2021
President, DAES Graduate Student Organization, UAlbany 2019 – 2020
Member, DAES Graduate Handbook policy update committee, UAlbany Fall 2018

Selected Community Engagement and Outreach

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

Awards, Funding

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

Training Intensives

Summer School on Speleothem Science *Innsbruck, AT* July 2022
American Meteorological Society Summer Policy Colloquium Summer 2020
PIRE-CREATE Summer School *São Paulo, Brazil* July 2019

Skills

Scientific:	**Programming**	Climate Data Operators (CDO), Git, LaTeX, Python, R
	Technical	CESM family output, high-performance parallelized supercomputing, UNIX, Zenodo, Zotero
	Lab/Field	Tree coring, soil bulk density analysis, lake core splitting
Languages:	**English**	native
	Spanish	fluent
	French	proficient

Professional Affiliations

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

American Geophysical Union (AGU) 2018 – present