Arianna M. Varuolo-Clarke

Lamont-Doherty Earth Observatory
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Education

Columbia University	PhD Earth & Environmental Science	Anticipated August 2023
Columbia University	MPhil Earth & Environmental Science	October 2021
Columbia University	MA Earth & Environmental Science	October 2020
Stony Brook University	MS Marine & Atmospheric Science	August 2018
Northern Vermont University [formerly Lyndon State College (LSC)]	BS Atmospheric Science	May 2016

Research Experience

Graduate Research Assistant 2018-present
Lamont-Doherty Earth Observatory of Columbia University, New York, NY

- Researching precipitation and drought variability over South America in the past, present, and future using observations, climate models, and climate proxies under the supervision of Drs. Jason Smerdon and Park Williams

Graduate Research Assistant 2016-2018
School of Marine and Atmospheric Science, Stony Brook University, Stony Brook, NY

- Investigated the role of horizontal resolution on the simulation of the spatial extent of the North American Monsoon system under the supervision of Dr. Kevin A. Reed

Significant Opportunities in Atmospheric Research and Science (SOARS) 2014-2017
National Center for Atmospheric Research, Boulder, CO

- **2017:** Investigated the influences of topography on the dynamics of the North American monsoon in climate model simulations under the mentorship of Dr. Brian Medeiros and B.J. Smith
- **2016:** Examined the roles of air-sea coupling and resolution on the Northeast Pacific stratocumulus to cumulus transition in the Community Earth System Model under the mentorship of Dr. Brian Medeiros, Dr. Karen McKinnon, and Dr. Gary Strand
- **2015:** Juneau Icefield Research Program: Mass Balance of Taku and Lemon Creek Glaciers under the mentorship of Dr. Rebecca Batchelor
- **2014:** Investigating Climate Responses to Large Volcanic Eruptions in an Ensemble of Climate Model Simulations under the mentorship of Dr. Brian Medeiros, Brian Bevirt, and Dr. Luna Rodriguez

Research Assistant 2013
Atmospheric Science Department, Lyndon State College, Lyndonville, VT

- Studied the effect of climate change on the growing season length and forest ecosystems in New England under the mentorship of Dr. J. Hanrahan

Peer-Reviewed Publications

Under review. **Varuolo-Clarke, AM**, Williams, AP, Smerdon, JE, Ting, M., Bishop, DA. An intensified moisture flux of the low-level jet drove half of the large wetting trend in southeastern South America from 1949-2020. *Geophysical Research Letters.*

Under review. Williams AP, Livneh B, McKinnon KA, Hansen WD, Mankin JS, Cook BI, Smerdon JE, **Varuolo-Clarke AM**, Bjarke NR, Juang CS, Lettenmaier DP. Growing impact of wildfire on western United States water supply. *Proceedings of the National Academy of Sciences USA.*

Accepted. Rodriguez-Caton M, Andreu-Hayles L, Daux V, Vuille M, **Varuolo-Clarke AM**, Oelkers R, Christie DA, D'Arrigo R, Morales MS, Palat Rao M, Srur AM, Vimeux F, Villalba R. Hydroclimate and ENSO Variability Recorded by Oxygen Isotopes from Tree Rings in the South American Altiplano. *Geophysical Research Letters.*

[3] 2021. Steiger NJ, Smerdon JE, Williams AP, Seager R, **Varuolo-Clarke AM**. Coupled megadrought risk in North and South America. Nature Geoscience, https://doi.org/10.1038/s41561-021-00819-9

[2] 2021. **Varuolo-Clarke AM**, Smerdon JE, Williams AP, Seager R. Gross discrepancies between observed and simulated 20th to 21st-century precipitation trends in Southeastern South America. *Journal of Climate*, 34, 6441-6457, https://doi.org/10.1175/JCLI-D-20-0746.1

[1] 2019. **Varuolo-Clarke, AM**, Reed K A, Medeiros, B. Characterizing the North American Monsoon in the Community Atmosphere Model: Sensitivity to Resolution and Topography, Journal of Climate, https://doi.org/10.1175/JCLI-D-18-0567.1

Presentations (first-author and presenter)

Varuolo-Clarke, A., Williams, A.P., Smerdon, J.E., 2021: **Intensified low-level jet and increased humidity drove nearly half of the large wetting trend in Southeastern South America.** American Geophysical Union, Annual Meeting 2021, , *Changes and Impacts of Climate Variability in South America*, New Orleans, LA.

Varuolo-Clarke, A., Smerdon, J.E., Williams, A.P., 2020: **Gross discrepancies between observed and simulated secular precipitation trends over the 20th-21st centuries in Southeastern South America.** American Geophysical Union, Annual Meeting 2020, *CMIP6 Climate Model Evaluation*, Virtual Meeting.

Varuolo-Clarke, A., Smerdon, J.E., Williams, A.P., 2019: **Investigating Opposing 20th-Century Precipitation Trends in Chile and Argentina using Observations and Models.** American Geophysical Union, Annual Meeting 20219, *Changes and Impacts of Climate Variability in South America*, San Francisco, CA.

Varuolo-Clarke, A., Smerdon, J.E., Williams, A.P., 2019: **Quantifying historical and future causes of hydroclimate variability in Chile and Argentina.** PIRE CREATE Annual Meeting, Sao Paulo, Brazil

Varuolo-Clarke, A., Reed, K.A., Medeiros, B., 2018: **Topographic Influences on the North American Monsoon.** American Geophysical Union, Annual Meeting 2018, *Monsoons: Observations, Subseasonal, Seasonal, and Interannual to Decadal Variability, Forecast, Climate Change, and Extremes*, Washington D.C.

Varuolo-Clarke, A., Reed, K.A., Medeiros, B., 2018: **Topographic Influences on the North American Monsoon in the Community Atmosphere Model.** WCRP Grand Challenge on Clouds, Circulation and Climate Sensitivity: 2nd Meeting on Monsoons and Tropical Rain Belts, Poster Session, Trieste, Italy.

Varuolo-Clarke, A., Reed, K.A., Medeiros, B., 2018: **Topographic Influences on the North American Monsoon in the Community Atmosphere Model.** 23rd Annual CESM Workshop, Poster Session, Boulder, CO.

Varuolo-Clarke, A., Medeiros, B., Reed, K.A., 2018: **Investigating the geographic controls of the North American Monsoon in the Community Atmosphere Model.** American Meteorological Society 33rd Conference on Hurricanes and Tropical Meteorology, Monsoon Oral Session, Ponte Vedra, FL.

Varuolo-Clarke, A., Medeiros, B., Reed, K.A., 2018: **Investigating the geographic controls of the North American Monsoon in the Community Atmosphere Model.** Northeastern Storm Conference, Oral Session, Saratoga Springs, NY.

Varuolo-Clarke, A., Medeiros, B., Reed, K.A., 2017: **Investigating the Influence of Topography on the Dynamics of the North American Monsoon in Climate Model Simulations.** Graduate Climate Conference Poster Session, Woods Hole, MA.

Varuolo-Clarke, A., Medeiros, B., Reed, K.A., 2017: **Investigating the Influence of Topography on the Dynamics of the North American Monsoon in Climate Model Simulations.** SOARS Poster Session 2017, Boulder, CO.

Varuolo-Clarke, A., Medeiros, B., Reed, K.A., 2017: **Investigating the Influence of Topography on the Dynamics of the North American Monsoon in Climate Model Simulations.** SOARS Colloquium 2017, Boulder, CO.

Varuolo-Clarke, A., Medeiros, B., Reed, K.A., 2016: **What are the roles of air-sea coupling and resolution for the Northeast Pacific stratocumulus to cumulus transition in the Community Earth System Model?** American Geophysical Union, Annual Meeting Poster Session 2016, *Toward Reducing Systematic Errors in Weather and Climate Models: Evaluation, Understanding, and Improvement*, San Francisco, CA.

Varuolo-Clarke, A., Medeiros, B., 2016: **What are the roles of air-sea coupling and resolution for the Northeast Pacific stratocumulus to cumulus transition in the Community Earth System Model?** SOARS Poster Session 2016, Boulder, CO.

Varuolo-Clarke, A., Medeiros, B., 2015: **Investigating Climate Responses to Large Volcanic Eruptions in an Ensemble of Climate Model Simulations,** Lyndon State College, Northeastern Storm Conference Oral and Poster Sessions 2015, Saratoga Springs, NY.

Varuolo-Clarke, A., Medeiros, B., 2015: **Investigating Climate Responses to Large Volcanic Eruptions in an Ensemble of Climate Model Simulations,**
American Meteorological Society, Student Conference Poster Session 2015, Phoenix, AZ.

Varuolo-Clarke, A., Medeiros, B., 2014: **Investigating Climate Responses to Large Volcanic Eruptions in an Ensemble of Climate Model Simulations,**
American Geophysical Union, Annual Meeting Poster Session 2014, *Large Initial-Condition Ensemble Simulations for Climate Change Research*, San Francisco, CA.

Varuolo-Clarke, A., Medeiros, B., 2014: **Investigating Climate Responses to Large Volcanic Eruptions in an Ensemble of Climate Model Simulations**, SOARS Colloquium 2014, Boulder, CO.

Varuolo-Clarke, A., Medeiros, B., 2014: **Investigating Climate Responses to Large Volcanic Eruptions in an Ensemble of Climate Model Simulations**, SOARS Poster Session 2014, Boulder, CO.

Peer Reviewer

Journal reviews: 1 *Climate Dynamics*; 2 *Global and Planetary Change*; 3 *International Journal of Climatology*; 4 *Journal of Climate*

Teaching Experience

Columbia University, New York, NY
Guest Lecture, LDEO Summer Interns Seminar Series, Summer 2021
- Lectured about South American hydroclimate, paleoclimate proxies, and climate modeling

Guest Lecture, "Introduction to Atmospheric Chemistry", EESCGU4924, Spring 2021
- Lectured about the influence of stratospheric ozone depletion on hydroclimate in South America

Teaching Assistant, "Introduction to Atmospheric Chemistry", EESCGU4924, Spring 2021
Teaching Assistant, "Earth's Environmental Systems: The Climate System", EESC2100, Fall 2019

New York University, New York, NY
Guest Lecture, "Topics in Environmental Science: Climate Change", Summer 2021
- Lectured about South American hydroclimate and climate modeling

Washington State University Upward Bound, Pullman, WA
Summer Academy Couse Instructor, Summer 2021
- Co-taught and co-developed a two week course on glaciers and climate change through a virtual expedition to the Juneau Icefield for high school students in the Upward Bound Program

University of Maine, Orono, ME
Guest Lecture, "Introduction to Glaciology", Spring 2021
- Lectured about hydroclimate in South America and different paleoclimate proxies

Borough of Manhattan Community College Upward Bound, New York, NY
Workshop Facilitator, Spring 2021
- Co-taught and co-developed two workshops on climate, glaciers, and sea level change for the Upward Bound students at Borough of Manhattan Community College

Stony Brook University, Stony Brook, NY
Guest Lecture, "Extreme Weather", ATM102.1/EST102.1, Fall 2017
- Lectured on foundations of climate and weather

Teaching Assistant, "Weather and Climate", ATM102.1/EST102.1, Spring 2017
Teaching Assistant, "Extreme Weather", ATM103.1, Fall 2016

Additional Experience

PIRE CREATE Summer School on Paleoclimate Reconstruction from speleothems and tree-ring records July 20 – July 26, 2019
University of Sao Paulo, Sao Paulo, Brazil

Summer School on Theory, Mechanisms and Hierarchical Modelling of Climate Dynamics: Multiple Equilibrium in the Climate System Participant June 25 – June 30, 2018
International Center for Theoretical Physics, Trieste, Italy

AMS Summer Policy Colloquium Participant, Washington, DC June 3 – June 12, 2018

Juneau Icefield Research Program (JIRP), Juneau, AK
Research – Juneau Icefield Research Program: Mass Balance of Taku and Lemon Creek Glaciers
Mentors – Dr. Matthew Beedle, Dr. Shad O'Neel Summer 2015

Honors and Awards

Columbia University Provost's Diversity Fellowship	2018-present
Columbia University's Dean's Fellowship	2018-2019
Maze-Landeau Graduate Student Travel Award	2018
Stony Brook Dean's Scholarship	Fall 2016, Spring 2017
Dr. David L. Ferguson Merit Award	Fall 2016
LSC Alumni Outstanding Senior Award	Spring 2016
LSC Dean's List Fall	2012, Spring 2013, Fall 2015, Spring 2016
AGU David J. Hoffman Award	September 2014
LSC Presidential Scholarship	2012-2014
LSC Scholar Award	2012-2015
LSC Promise Scholarship	2012-2015
LSC Honors Scholarship	February 2013
LSC Leadership Scholarship	February 2013
LSC T.N. Vail Endowment	February 2013

Leadership and Service

Lamont Diversity, Equity, Inclusion & Anti-bias Committee 2021-2023
Lamont-Doherty Earth Observatory of Columbia University

Ocean and Climate Physics Division Seminar Committee 2021-2022
Lamont-Doherty Earth Observatory of Columbia University

URGE Lamont Pod Organizer 2021
Lamont-Doherty Earth Observatory of Columbia University

Climate Data Guide, Board of Advisors (inaugural member) 2020-2022
National Center for Atmospheric Research, Boulder CO
- NSF-funded effort to grow, improve and diversify the Guide

The Climate Consensus 2020-2022
Northern Vermont University at Lyndon, Lyndonville VT
- Network of scientists working towards improved climate change communication

Diversity Co-Chair, Graduate Student Committee 2020-2021
Lamont-Doherty Earth Observatory of Columbia University

Lamont-Doherty Earth Observatory Open House Volunteer 2018-2019

School of Marine and Atmospheric Science Graduate Club, Stony Brook, NY August 2017-May 2018

Executive Board of Beta Alpha Sigma Zeta 2015-2016
Northern Vermont University at Lyndon, Lyndonville VT

- *President*-plan and facilitate the annual Northeast Kingdom Science Fair for 3rd-8th graders, where there are typically 100 student projects.

Student Conference Planning Committee for National AMS February 2015-May 2016

- *Committee Member*-plan and advertise the Annual National AMS Student Conference. Participate in conference calls and email information respective universities. Consider ideas and themes of conference. Work as a team with committee members to complete tasks.

Technical Skills

Models: Community Earth System Model (CESM)
Programming Languages: Python, NCL, Matlab
Operating Systems: Mac, Windows, Linux, Unix

Professional Affiliations

National Association of Black Geoscientists 2021-present
American Geophysical Union 2014-present
American Meteorological Society 2014-present
Earth Science Women's Network 2014-present