Bruno Zanetti Ribeiro, Ph.D.

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EDUCATION

2018 **Ph.D. in Meteorology**

National Institute for Space Research (INPE; Brazil), 30 May 2018

Dissertation: "Quasi-Linear Convective Systems in Southern Brazil"

Included a period as a visiting student (2015-2016) at the State University of New York at Albany funded by the Science Without Borders program.

2014 **M.S. in Meteorology**

National Institute for Space Research (INPE; Brazil), 26 February 2014

Thesis: "Synoptic climatology of warm fronts in Southeastern South America"

2012 **B.S. in Meteorology**

Federal University of Pelotas (UFPel; Brazil), 12 January 2012

PROFESSIONAL EXPERIENCE

2024-Present **Postdoc**

University of Oklahoma School of Meteorology – Norman, OK

The research focuses on understanding convection in the Amazon using modeling and observations from the Amazon Tall Tower Observatory (ATTO).

2019 - 2024 **Postdoc**

University at Albany, State University of New York – Albany, NY

The research focuses on improving the predictability of severe weather events using ensemble forecasting techniques. The primary goal is to understand the factors contributing to low predictability, both in the short range (a few hours before) and the medium range (3-5 days before). We utilize simulations from the WRF and MPAS models run on NCAR's Cheyenne supercomputer, operational models and reanalysis datasets. This research aims to enhance our ability to anticipate and mitigate the impacts of severe weather events.

2018 - Present **Coordinator**

PREVOTS Project

Composed of several volunteer meteorologists, researchers and students from Brazil. The main objective is to build a database of severe weather reports (tornado, hail, wind gusts), improve severe weather forecasting and educate the general public about severe storms. My primary role as coordinator is to foster collaborations and partnerships, implement quality control and data sharing policies, and engage students to participate.

2021 **Researcher/Developer**

Paraná Meteorological Service (SIMEPAR) – Curitiba, Brazil

Project funded by a state electrical energy company with the main goal of reducing power outages associated with weather events. The activities included analyses of the predictability of weather events responsible for widespread power outages and use of satellite and radar data along with artificial intelligence algorithms to predict convective initiation.

2017-2019 **Researcher/Developer**

Satellite and Environmental Systems Division (DSA/CPTEC/INPE) – Cachoeira Paulista, Brazil

Project funded by FAPESP to study severe thunderstorms in Southeastern Brazil (SOS-Chuva). The main activities included development of products for nowcasting and severe thunderstorm forecasting, evaluation of the WRF model run at CPTEC and quality control of data from field campaigns.

2016-2017 **Meteorologist**

Center for Lightning Monitoring and Warning (ELAT/INPE) – São José dos Campos, Brazil

The company provides weather and climate support to other companies, mainly petrochemical and wind energy industries. Some responsibilities included issuing warnings in the case of lightning and heavy rain, general weather forecasts and subseasonal forecasts. Also responsible for implementing a regional operational WRF model and generating specific products for client companies derived from the WRF output.

MAIN SCIENTIFIC PUBLICATIONS

2024 **Ribeiro, B. Z.**, Weiss, S. J., Bosart, L. Short and Medium-Range Predictability of Warm-Season Derechos. Part I: Operational Predictability and Composites. *Weather and Forecasting*. In press.

2024 Salio, P., Bechis, H., **Ribeiro, B. Z.**, Nascimento, E, Galligani, V., and others. Towards a South American Severe Weather Reports Database. Accepted in the *Bulletin of the American Meteorological Society*.

2022 **Ribeiro, B. Z.**, Weiss, S., Bosart, L. An Analysis of the 3 May 2020 Low-Predictability Derecho Using a Convection-Allowing MPAS Ensemble. *Weather and Forecasting*. v. 37, 219-239. (https://doi.org/10.1175/WAF-D-21-0092.1)

2020 Vendrasco, E. P., Machado, L. A. T, **Ribeiro, B. Z.**, Freitas, E. D., Ferreira, R. C., Negri, R. G. Cloud-Resolving Model Applied to Nowcasting: An Evaluation of Radar Data Assimilation and Microphysics Parameterization. *Weather and Forecasting*, v. 35, p. 2345-2365. (https://doi.org/10.1175/WAF-D-20-0017.1)

2020 Freire, J. L. M., Longo, K. M., Freitas, S. R., Coelho, C. A. S., Molod, A. M., Marshak, J., Silva, A., **Ribeiro, B. Z.** To What Extent Biomass Burning Aerosols Impact South America Seasonal Climate Predictions? *Geophysical Research Letters*, v. 47, i. 16. (https://doi.org/10.1029/2020GL088096)

2019 **Ribeiro, B. Z.**, Machado, L., Huamán, J., Biscaro, T., Freitas, E., Goodman, S., Mozer, K. An Evaluation of the GOES-16 Rapidscan for Nowcasting in Southeastern Brazil: Analysis of a Hailstorm Case. *Weather and Forecasting*, v. 34, p. 1829-1848. (https://doi.org/10.1175/WAF-D-19-0070.1)

2019 **Ribeiro, B. Z.**, Seluchi, M. E. A climatology of quasi-linear convective systems and associated synoptic-scale environments in Southern Brazil. *International Journal of Climatology*, v. 39, I. 2, p. 857-877. (https://doi.org/10.1002/joc.5847)

2018 **Ribeiro, B. Z.**, Bosart, L. Elevated Mixed Layers and Associated Severe Thunderstorm Environments in South and North America. *Monthly Weather Review*, v. 146, p. 3-28. (https://doi.org/10.1175/MWR-D-17-0121.1)

2016 **Ribeiro, B. Z.**, Seluchi, M. E., Chou, S. C. Synoptic climatology of warm fronts in Southeastern South America. *International Journal of Climatology*, v. 36, p. 644-655. (https://doi.org/10.1002/joc.4373)

2016 Rocha, F., Aravéquia, J. A., **Ribeiro, B. Z.** A study of cyclones and atmospheric circulation patterns in the South Atlantic Ocean near the coast of South and Southeast Brazil using the Era-Interim reanalysis. *Brazilian Journal of Meteorology*, v. 31, p. 141-156 (In Portuguese). (https://doi.org/10.1590/0102-778631220140151)

Under review:

2024 **Ribeiro, B. Z.**, Weiss, S. J., Bosart, L. Short and Medium-Range Predictability of Warm-Season Derechos. Part II: Experiments Using a Convection-Allowing MPAS Ensemble. Under review in *Weather and Forecasting*.

2024 Bechis, H., **Ribeiro, B. Z.**, Cancelada, M., Salio, P., Ruiz, J., Granato, A., Saucedo, M. Environments associated with reports of hail and convectively-generated damaging wind gusts in South America. Under review in Atmospheric Research.

RESEARCH SKILLS

Programming	Python (including XArray, Pandas, Metpy, Cartopy, and Matplotlib), NCAR Command Language (NCL), bash, and csh.
Datasets	ERA-5 and CFSR reanalyses, model outputs (ECMWF, GFS, GEFS, NAM, HRRR), satellite data from GOES-16, CMORPH, and TRMM, radar, surface station data, and atmospheric soundings.
Modeling	WRF and MPAS, including operational setups, tailoring outputs to meet clients' specific requirements, and conducting objective evaluations of deterministic and ensemble forecasts. Experience with HYSPLIT trajectory model and the Data Assimilation Research Testbed (DART).
Field campaigns	RELAMPAGO and SOS-CHUVA, where responsibilities included field measurement planning, collaboration with fellow scientists, and engagement with local communities.

AWARDS/GRANTS

2023 "Multi-scale prediction of extreme weather events for hydrological applications", CO-Principal Investigator, awarded by Brazil's National Council for Scientific and Technological Development (CNPq).

2023 **"**Understanding the predictability of severe weather events in Brazil using convection-allowing ensembles", CO-Principal Investigator, awarded by Brazil's National Council for Scientific and Technological Development (CNPq).

2023 Selected member of the 2023 Early-Career Leadership Academy, organized by the American Meteorological Society.

2018 Ph.D. dissertation selected to represent the National Institute for Space Research (INPE) in the National Dissertation Award from CAPES (Brazil).

2017 Best oral presentation in the Weather and Climate Studies session at the XVI Meeting of Meteorology Graduate Students from CPTEC/INPE (Brazil).

2016 Best poster presentation in the Weather and Climate Studies session at the XVI Meeting of Meteorology Graduate Students from CPTEC/INPE (Brazil).

2015 Scholarship awarded by the Science Without Borders program (Brazil) to spend one year as a visiting Ph.D. student abroad.

2011 Grant for organization of the IV South Brazilian Meteorology Conference (ESBMET).

INVITED TALKS

2023 "Progress on research and forecasting of severe storms in Brazil," *Astronomy, Geophysics and Atmospheric Sciences Institute, University of São Paulo, Brazil*

2023 "Severe Storms Research and Forecasting in Subtropical South America", *11th European Conference on Severe Storms, Bucharest, Romania*

2023 "Severe Storm Reports Databases as Important Tools in Nowcasting Operations: Perspectives from the Brazilian Database", *Series of Webinars on Nowcasting Operations and Techniques: Perspectives for South America*

2023 "My career in Geosciences". Talk about career perspectives to high-school students in *Pedro Osório, Brazil*.

2022 "An Analysis of the Costliest Severe Thunderstorm Event in US History: the 10 August 2020 Derecho". *Capital District Postdocs Association, Albany, NY.*

2021 "The 30 June 2020 severe weather event," *Civil Defense of Santa Catarina State, Brazil.*

2016 "A Comparison of South and North America Severe Weather Events". *Storm Prediction Center/National Severe Storms Laboratory, Norman, OK.*

2016 Round table about the influence of social media in Meteorology. *XVI Meeting of Meteorology Graduate Students from CPTEC/INPE (Brazil).*

2016 Round table about young scientists in Meteorology. *XVI Meeting of Meteorology Graduate Students from CPTEC/INPE (Brazil).*

TEACHING EXPERIENCE

2023 Guest lecturer in "Mesoscale Processes," *Department of Atmospheric and Environmental Sciences, University at Albany*. Responsible for creating and teaching a new class on mesoscale convective systems.

2023 Guest lecturer in "Weather, Climate Change, and Societal Impacts," *Department of Atmospheric and Environmental Sciences, University at Albany*.

2019 Nowcasting Training, *Water Management Institute of Minas Gerais State, Brazil*. Responsible for developing the course for operational forecasters.

2019 Nowcasting Training, *State University of São Paulo, Brazil*. Responsible for developing the course for undergraduate students.

2018 Nowcasting Training, *Meteorological Institute of Uruguay*. Responsible for developing the course for undergraduate students and operational forecasters, in Spanish.

2018	Nowcasting Training, *Center for Weather Forecasting and Climate Studies (CPTEC), Brazil*. Responsible for developing the course for operational forecasters.
2017	Guest lecturer in Synoptic Meteorology, *University of São Paulo, Brazil*.
2010-2011	Tutor of undergraduate students in Calculus I and II, Classical Mechanics, Advanced Hydrodynamics and Dynamic Meteorology courses, *Federal University of Pelotas, Brazil*.

COURSES

2023	*Supervised Learning in Machine Learning: Regression and Classification*, DeepLearning.AI/Stanford University: course on basic methods of supervised machine learning.
2023	*AMS Early Career Leadership Academy*: the academy is an intensive experience where participants are engaged in learning leadership skills and promoting diversity, equity and inclusion in the workplace.
2023	*The Inclusive STEM Teaching Project*: the course focuses on teaching tools that increase students' trust and improve classroom atmosphere, with a focus on diversity, equity and inclusion.

VOLUNTEER/OUTREACH ACTIVITIES

2024 - Present	Academic Ambassador of American Meteorological Society's Committee on Hispanic and Latinx Advancement (CHALA).
2021 - 2023	Member of the Nowcasting Scientific Committee, a group of scientists selected by the Brazilian government to determine best practices for implementing nowcasting in the country.
2019 - Present	Creator and manager of a website containing a blog with discussion of weather and climate events and operational model outputs for educational purposes with focus on South America (AtmosferaLivre.com).
2023	Judge for student presentations at the AMS 20th Mesoscale Processes Conference.
2022 - 2023	Coordinator of the DAES/ASRC Joint Colloquium Seminars, a series of weekly invited talks.

2022	Judge for Outstanding Student Presentation Awards at the AGU Fall Meeting.
2020	Participant of the SPC/NSSL Hazardous Weather Testbed/Spring Forecasting Experiment (virtual).
2016	Participant of the SPC/NSSL Hazardous Weather Testbed/Spring Forecasting Experiment, Norman, OK.
2015	Student volunteer at the 16th AMS Conference on Mesoscale Processes.
2013	Member of the organizing committee of the XII Meeting of Meteorology Graduate Students from CPTEC/INPE (EPGMET).
2011	Lead undergraduate organizer for the IV South Brazilian Meteorology Conference (ESBMET), successfully securing funding for the conference through a grant proposal.
2009-2011	Member of the Tutoring Education Program (PET), which consists of a dedicated group of undergraduate students focused on advancing outreach, education, and research initiatives within local communities.

Reviewer for scientific journals:

2024 - Present	Journal of Geophysical Research - Atmospheres
2023 - Present	Journal of Climate
2023 - Present	Climate Dynamics
2023 - Present	Weather and Forecasting
2021 - Present	Monthly Weather Review
2015 - Present	International Journal of Climatology

Societies and organizations:

2021 - Present	Member of the American Meteorological Society
2021 - Present	Member of the Brazilian Society for Scientific Progress

LANGUAGE PROFICIENCY

English	Fluent
Spanish	Conversational
Portuguese	Native