Rachael Nichole Isphording

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EDUCATION

The University of Texas at Austin — *Austin, TX, USA*
Master of Science in Geological Sciences — *GPA: 3.91/4.0*
Concentration: Climate Science

Embry-Riddle Aeronautical University — *Daytona Beach, FL, USA*
Bachelor of Science in Applied Meteorology — GPA: 3.62/4.0
Minor: *Applied Mathematics* — *Honors Program, cum laude*

RESEARCH EXPERIENCE

Post-Master's Research Associate
Atmospheric Radiation Measurement (ARM) Data Center, Climate Change Science Institute
Oak Ridge National Laboratory, Oak Ridge, TN, USA
September 2018 – Present

- Perform standardized metadata coordination using subject matter knowledge and search domain expertise.
- Develop python-based software to perform metadata auditing and gather metrics for the ARM Data Center.

Terrestrial Environments Intern
Jacobs Space Engineering Group
NASA Marshall Space Flight Center, Huntsville, AL, USA
June 2018 – August 2018

- Performed a standardized quality control (QC) assessment methodology to flag erroneous weather balloon data for the creation of an updated archive of operational NASA weather data.
- Computed QC thresholds of atmospheric data variables for NASA SLS design and day-of-launch parameters.

Graduate Research Assistant
The Jackson School of Geosciences
The University of Texas at Austin, Austin, TX, USA
August 2015 – August 2017

- Applied advanced statistical and spatial analysis techniques to attribute long-term climate changes in tropical rainforest regions to responses in anthropogenic and natural climate forcings.
- Provided valuable new insights into the long-term behavior of the Hadley Circulation centralized over the Amazon and Congo rainforests, respectively, compared to that of the full tropical belt.

Post-Bachelor's Research Associate
Climate Change Science Institute
Oak Ridge National Laboratory, Oak Ridge, TN, USA
January 2015 – December 2016

- Researched and synthesized extreme climate and weather events publications and data sources for the development of an extreme events Web portal tailored to climate risk mitigation and assessment. Individual focus areas included: wildfires, droughts and flood risks and impacts on water resources and health.

Research Assistant
Bethune-Cookman University, Daytona Beach, FL, USA
September 2014 – December 2014

- Assisted with the development of an algorithm to correct for underwater backscattering of light through controlled lab experiments and mathematical manipulation.
- Applied algorithm to the remote sensing of underwater vegetation to test an improved method for benthic mapping.

Supervised Independent Research
Embry-Riddle Aeronautical University, Daytona Beach, FL, USA
January 2014 – September 2014

- Performed regional and seasonal statistical variability analyses of simulated wind farms using the National Renewable Energy Laboratory's Eastern U.S. Wind Dataset.

Intern
NASA DEVELOP National Program
Mobile County Health Department, Mobile, AL, USA
January 2013 – August 2013

- Participated in a small, student-led research team that addressed environmental issues in the community and demonstrated the utility of NASA Earth Observation Systems for the project partners' decision-making process.
- Assessed the impacts of modeled urban growth on water quality in the local drinking water reservoir.
- Evaluated the impacts of wildfires by analyzing burned biomass and contributions of aerosols to ambient air quality.

TEACHING EXPERIENCE

Graduate Teaching Assistant
The Jackson School of Geosciences
The University of Texas at Austin, Austin, TX, USA
January 2016 – December 2016

- Instructed 3 weekly labs to classes of 20 students to provide hands-on experience in a survey of geological topics including: rock and mineral classification, hydrogeology, and structural geology.
- Led field trips to promote application of classroom material to real-world situations.
- Collaborated on developing engaging assignments with other TAs and Faculty supervisors.

Weather Lab Tutor
Embry-Riddle Aeronautical University, Daytona Beach, FL, USA
January 2014 – December 2014

- Tutored peers in Meteorology, Mathematics, Physics, and Technical Writing course work.
- Participated in campus outreach and public relations events.
- Explained meteorological phenomena to elementary and middle school students through creative and interactive activities.

LEADERSHIP AND VOLUNTEER EXPERIENCE

Environmental Security Committee Member
American Meteorological Society, USA
January 2015 – Present
- Synthesized literature focused on water security to present at the 2016 AMS Summer Community Meeting.
- Summarized and organized literature on climate change and the implications to global and national security in the Arctic and Syria.

Volunteer
Citizens' Climate Lobby, Knoxville, TN, USA
October 2018 – Present
- Prepare and present materials on climate change and human health to discuss with city officials and my local U.S. Congress members in separate, collaborative meetings with other volunteers.
- Volunteer at local community events (such as Knoxville's EarthFest and Sing for the Climate events) to showcase CCL and speak with community members about climate change.
- Attended training workshops to learn skills for communicating climate change concerns to community members and government officials.

Climate Forum Co-chair
The University of Texas at Austin, Austin, TX, USA
August 2016 – May 2017
- Co-organized weekly seminar for students, faculty, and visiting scientists to present and discuss recent climate research.

Resident Advisor
Embry-Riddle Aeronautical University, Daytona Beach, FL, USA
January 2011– December 2014
- Provided crisis intervention, conflict mediation, counseling, tutoring, and advisement to a hall of 40 residents from diverse, international backgrounds.
- Enhanced the community and academic environment by organizing and executing social, educational, cultural, and academic programs on a biweekly basis.

DEVELOP Campus Ambassador
NASA DEVELOP National Program
Embry-Riddle Aeronautical University, Daytona Beach, FL, USA
August 2013 – May 2014
- Liaised between NASA administration and university officials to coordinate campus recruiting events.
- Showcased NASA DEVELOP at campus career exploration events.

Student Government Representative/Secretary
Student Government Association
Embry-Riddle Aeronautical University, Daytona Beach, FL, USA
September 2011 – May 2012
- Recorded minutes for weekly meetings and planned bi-yearly leadership development outings.
- Voiced students' needs and suggestions to Housing and Residence Life administration.
- Organized and executed large projects and outreach initiatives on campus.

Volunteer Firefighter

Fairhope Volunteer Fire Department, Fairhope, AL, USA
June 2009 – August 2010

- Participated in weekly training to develop emergency responder skills and equipment familiarity.
- Responded to and helped alleviate community emergency situations.

TECHNICAL SKILLS

Python, SQL, NCAR's Command Language (NCL), ArcGIS, ENVI Classic, ENVI 5, Linux Commands, HTML/CSS, Microsoft Office

AWARDS

- 2020 University of New South Wales Scientia PhD Scholarship
- 2014 Bagby Award (ERAU Outstanding Meteorology Senior)
- Embry-Riddle Senior Eagle Scholarship
- 2009 Fairhope Volunteer Fire Department Explorer (Junior Firefighter) of the Year

PUBLICATIONS AND PRESENTATIONS

- Isphording, R. and R. Fu: **Atmospheric Circulation Variability in the Tropics Linked to Climate Changes in the Amazon and Congo**. *Clim. Dyn*., in preparation.
- Isphording, R. **Palaeoclimatological Indicators of Changes in the Strength and Width of the Hadley Circulation: A Review**. *Palaeogeography, Palaeoclimatology, Palaeoecology,* in preparation.
- **ARM Data: Metrics, Processing, and Metadata Management for Evaluation Data Products**; January 2020; American Meteorological Society Annual Meeting, oral presentation (lead-author/presenter).
- **Metadata for Atmospheric Radiation Measurement (ARM) Data**; American Geophysical Union Annual Meeting, December 2019, poster presentation (co-author).
- **ARM Evaluation Data User Metrics and Best Practices**; June 2019; ASR User and PI Meeting, poster presentation (lead author).
- Milrad, S. M., E. H. Atallah, and J. R. Gyakum, 2019: **The Extreme Precipitation Index (EPI): A Coupled Dynamic-Thermodynamic Metric to Diagnose Mid-Latitude Floods Associated with Flow Reversal**. *Wea. Forecasting,* in press.
  - Acknowledgement for providing technical assistance with the Pearson product-moment correlations.
- **Integrated Cloud and High-Performance Computing Platform for Interactive Analysis of ARM Data**; January 2019; American Meteorological Society Annual Meeting, oral presentation (presenter).
- **Long-term Atmospheric Circulation Variability in the Tropics Linked to Climate Changes in the Amazon and Congo**; April 2017; The University of Texas at Austin, oral presentation (presenter).
- H. J. Cho, B. Piñeyro & F. W. Gasdia (2016) **Water correction for improved benthic vegetation signal using satellite-borne hyperspectral data**, *International Journal of Remote Sensing*, 37:17, 4084-4100, DOI: 10.1080/01431161.2016.1207262
  - Acknowledgement for participation in and contribution to the preliminary work of the research.
- **National Extreme Events Data and Research Center (NEED)**; August 2015; Oak Ridge National Laboratory, poster presentation and oral presentation (presenter).

- Isphording, R., R. Snow, and M. Snow, 2014: **Mitigating the effects of climate change with wind energy and GIS**. British Journal of Applied Science and Technology, doi: 10.9734/BJAST/2015/14253.
- **Assisting State and Federal Post-Wildfire Assessments through the Application of EOS Data**; August 2013; NASA Stennis Space Center, oral presentation (co-presenter).
- **Implementing the SLEUTH Urban Growth Model to Predict Urbanization in the Big Creek Lake Watershed**; April 2013; presented to the Mobile Area Water and Sewer System (MAWSS), oral presentation (co-presenter).