Andrew Polasky

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Current Position

2023- *Post-Doctoral Researcher*, Department of Meteorology and Atmospheric Science, Pennsylvania State University

- I am currently a postdoc working on projects related to regional changes in climate.

- One project is focused on using reanalysis and climate model data to understand changes to the South American low level jet and precipitation in the Amazon basin.

- A second project uses the WRF-Chem model and field campaign data collected to understand the arctic boundary layer and chemistry, especially around breaks in sea ice.

Education

2023 PhD in Meteorology and Atmospheric Science, Pennsylvania State University, University Park, PA

- My PhD research focused on the development of downscaled climate model scenarios of temperature and precipitation using machine learning methods.

- Developed projections for the Midwest US and West Africa for use by a multi-disciplinary team evaluating food-energy-water use.

- Created a python package of the downscaling tools for use by other researchers.

2015 BA in Physics, Carleton College, Northfield, MN

Work Experience

2018-2022 *High Performance Computing Software Consultant*
Pennsylvania State University, Institute for Computational and Data Sciences
During my PhD, I have worked as a graduate assistant for the Penn State "Roar" high performance compute cluster. I assisted research groups from across the university in installing software, adapting code to utilize the HPC system, and troubleshoot issues on the system.

2016-2017 *Teaching Assistant*
Pennsylvania State University, Department of Meteorology and Atmospheric Science
I was a teaching assistant for two introductory Meteorology courses. I was responsible for giving some of the lectures, assisting students in office hours, and grading assignments.

2015-2016 *Nordic Center Assistant Director*
Snow Mountain Ranch, YMCA of the Rockies
Managed the retail and rental shop, taught ski lessons, and set the schedule for the shop.

2014 *Research Assistant, Research Experience for Undergraduates*
University of Toledo, Toledo, Ohio
Developed a solar irradiance model based on data from the National Digital Forecast Database, and data from a local solar array and pyranometer. I wrote the model in python using a combination of physical and statistical modeling techniques. I presented the results of the solar irradiance

research at the American Meteorological Society Student Conference in January, 2015.

2012   *Summer Intern*
Center for Energy and the Environment, Minneapolis, MN
I worked on developing an online calculator tool for residential water heaters, collected data from a variety of sources to create equations to model energy use and household costs for different types of water heaters and water use patterns.

Skills

- *Python*: Including libraries: xarray, metpy, tensorflow, keras, sklearn, scipy, pandas, cartopy, jupyter, numpy, matplotlib

- *WRF*: Including WRF-Chem

- *HPC*: On systems using Torque/Moab and Slurm, installing and trouble shooting a range of software on an HPC system, containerization with apptainer, bash scripting

- *Geospatial datasets*: Familiar with NetCDF and GRIB formats, I've worked with CMIP5 and 6, GSOD, GHCN, ERA5, CHIRPS, TRMM, HURDAT2 datasets

Publications & Talks

Publications

2024   Polasky, A., Evans, J.L., Fuentes, J.D. *Statistical downscaling for precipitation projections in West Africa.* Theor Appl Climatol 155, 327–347 (2024). https://doi.org/10.1007/s00704-023-04637-4

2023   Polasky, A., Evans, J.L., Fuentes, J.D. *CCdownscaling: A Python Package for Multivariable Statistical Climate Model Downscaling.* Environmental Modeling and Software, https://doi.org/10.1016/j.envsoft.2023.105712.

2021   Polasky, A., Evans, J.L., Fuentes, J.D., Hamilton, H. *Statistical Climate Model Downscaling for Impact Projections in the Midwest United States*, International Journal of Climatology, https://doi.org/10.1002/joc.7406.

Conference Presentations

2024   Polasky, A., Fuentes J. D., Shepson P., Pratt K., Lance S., Simpson W., Acevedo O., Brockway N., Costa F., Jeong D., Hajny K., Maroneze R., Peterson P., Starn T., Woods S. *Evaluation of Atmospheric Boundary Layer Parameterizations to Estimate Energy and Mass Transport in the Arctic using the WRF Model*, presented at American Meteorological Society Annual Meeting, Conference on Atmospheric Chemistry, Baltimore, MD

2020   Polasky, A., Evans, J.L., and Fuentes, J. *Downscaling Climate Model Data for Energy and Crop Modelling Using Self-Organizing Maps*, presented at American Meteorological Society Annual Meeting, Conference on Artificial Intelligence for Environmental Science, Boston, MA

2019   Polasky, A, Evans, J.L., and Fuentes, J. *Climate Model Downscaling using Self Organizing Maps*, presented at MIDAS Data Science Consortium, Ann Arbor, MI

2019

Polasky, A., Hamilton, H., Evans, J.L., and Fuentes, J. *Statistical Downscaling over Illinois Using Self Organizing Maps*, presented at American Meteorological Society Annual Meeting, Conference on Climate Variability and Change, Phoenix, AZ

2018   Polasky, A. and Evans, J.L. *Statistical Modeling of Tropical Cyclone Wind Radii*, presented at American Meteorological Society Conference on Hurricanes and Tropical Meteorology, Ponta Vedra Beach, FL

CONFERENCE POSTERS

2023   Polasky, A., Evans, J.L., and Fuentes, J. *Downscaling of West African Precipitation using Self Organizing Maps*, poster presented at American Meteorological Society Annual Meeting, Conference on Climate Variability and Change, Denver CO

2023   Polasky, A., Evans, J.L., and Fuentes, J. *CCdownscaling: A Python Package for Multivariable Statistical Climate Model Downscaling*, poster presented at American Meteorological Society Annual Meeting, Symposium on Advances in Modeling and Analysis Using Python, Denver CO

2021   Polasky, A., Evans, J.L., and Fuentes, J. *Statistical Downscaling for Local Applications in West Africa*, poster presented at American Meteorological Society Annual Meeting, Conference on Climate Variability and Change, Virtual

2015   Polasky, A. and Ellingson, R. *Solar Forecasting Model based on the National Digital Forecast Database*, poster presented American Meteorological Society Annual Meeting, Student Conference, Phoenix, AZ

Teaching

2017   *Teaching Assistant*: Introductory Meteorology
2016   *Teaching Assistant*: Introduction to Weather Analysis

Mentoring

2020-2023   Advised REU students Claire Sheeren (2023), Sam Muir (2021), Rebecca Beals (2020), and Paige Elliot (2020)

Service

2018-2019   *Graduate Student Representative*: Graduate Advisory Planning Committee, Department of Meteorology and Atmospheric Science, Penn State University
2023-2024   *Treasurer and Webmaster*: Postdocs of Earth and Mineral Science, Penn State University
2022-2023   *Manuscript Reviewer:* Advances in Statistical Climatology, Meteorology and Oceanography, Big Earth Data, Stochastic Environmental Research and Risk Assessment, Water Conservation Science and Engineering