Brianne (Gerber) Nelson

Atmospheric Scientist | Scientific Software Developer
briannemg@gmail.com | github.com/briannemg | linkedin.com/in/brianne-gerber-nelson

Professional Summary

Atmospheric scientist with over 8 years of experience in numerical weather prediction (NWP), forecast verification, and scientific data analysis. Skilled in scientific programming (Python, shell scripting, R) and high-performance computing (HPC) to automate and accelerate weather modeling and evaluation workflows. Adept at research documentation, workflow automation, and collaborative development to advance operational forecasting and atmospheric science research.

Core Competencies

- Numerical Weather Prediction (NWP)
- Forecast Verification & Model Evaluation (METplus, Statistical Methods)
- Scientific Programming (Python, R, Shell Scripting)
- Data Analysis & Visualization (NetCDF, GRIB, Statistical Methods)
- High-Performance Computing (HPC)
- Research Documentation & Technical Writing (Sphinx, ReadTheDocs)
- Workflow Automation & Pipeline Development
- Weather Modeling Systems (WRF)
- Version Control & Collaboration (Git, GitHub)

Experience

Associate Scientist II

National Center for Atmospheric Research (NCAR), Boulder, CO | Dec 2019 – Present

- Led automation of data processing and verification workflows to improve evaluation speed and accuracy of experimental weather modeling systems.
- Developed and maintained Sphinx-based documentation to increase accessibility and reproducibility of scientific tools.
- Adapted quickly to a variety of projects across the research group, contributing to diverse modeling and verification efforts while specializing in forecast verification.
- Collaborated with multidisciplinary teams to support ensemble and deterministic forecasts, combining scientific expertise with software best practices.

Associate Scientist

AWS Truepower (a UL Company), Albany, NY | Jun 2017 – Oct 2019

- Produced and verified meteorological and power forecasts for renewable energy clients using statistical methods and data quality assessments.
- Automated forecast verification pipelines with Python, enhancing data accuracy and reporting efficiency.
- Partnered with web developers to deliver client-facing forecast visualization tools grounded in meteorological science.
- Generated manual solar power forecasts for California, integrating observational and model data.

Education

Master of Science in Atmospheric and Environmental Science
South Dakota School of Mines and Technology, Rapid City, SD | May 2015
• GPA: 3.91 / 4.00
• Thesis: Verification and Assessment of Operational Local Area Weather Forecasting Models

Bachelor of Science in Atmospheric Science
University of Kansas, Lawrence, KS | May 2012
• GPA (Major): 3.42 / 4.00
• Certification in Research Experience

Research Experience

Graduate Researcher – Atmospheric and Environmental Sciences
South Dakota School of Mines and Technology | Aug 2013 – May 2015
• Built and utilized UNIX-based verification software for precipitation forecasts from the WRF system.
• Processed meteorological data in NetCDF and GRIB formats.
• Developed skills in R, NCL, UNIX Bash, and C-Shell scripting.
• Publication: Nelson, B. (2015). *Verification and Assessment of Operational Local Area Weather Forecasting Models* (M.S. Thesis). South Dakota School of Mines and Technology.

Undergraduate Research Assistant – Atmospheric Science
University of Kansas | Aug 2011 – May 2012
• Analyzed synoptic and mesoscale tornado outbreak conditions using GEMPAK and shell scripting.
• Conducted data visualization and synoptic pattern identification.

Projects

I-WRF Use Case Development
Developed experimental weather forecast use cases, automating workflows with Python and Bash in High-Performance Computing environments.
Tools: METplus, Bash, HPC, Git, Sphinx, Read the Docs

HAFS Precipitation Verification & Visualization
Contributed to verification and documentation of HAFS precipitation forecasts using METplus; automated evaluation and maintained project documentation.
Tools: METplus, Bash, HPC
Publication: Newman, K.M., Nelson, B., Biswas, M., & Pan, L. (2024). Multi-season evaluation of HAFS quantitative precipitation forecasts. *Frontiers in Earth Science, 12,* 1417705. DOI: https://doi.org/10.3389/feart.2024.1417705

Responsive Web Design Portfolio
Completed freeCodeCamp responsive web design certification, building five projects focused on semantic HTML and CSS layout techniques.
Tools: HTML5, CSS3

GitHub: https://github.com/briannemg

Weather Model Verification Toolkit (Thesis Project)
Developed a UNIX-based tool for WRF precipitation forecast verification using NetCDF and GRIB datasets.
Tools: Bash, C-Shell, R, NCL, NetCDF, GRIB

Technical Skills

Proficient In: Python, Shell scripting (Bash, C-Shell), METplus, NetCDF, GRIB, NCL (NCAR Command Language), GitHub, Sphinx, Git, ReadTheDocs, Markdown, XML

Familiar With / Previously Used: R, HTML, CSS, MATLAB, Fortran90, GEMPAK, IDL, JavaScript (learning)

Data & Analysis: Statistical Analysis, Forecast Verification, Data Visualization

Scientific Tools & Modeling: WRF, High-Performance Computing (HPC), Weather Forecasting, Ensemble Modeling

Platforms & Software: UNIX/Linux, High-Performance Computing Clusters, Shell Environments

Other Strengths: Technical Writing, Research Communication, Workflow Automation, Collaboration