Stefan F. Cecelski

stefan.cecelski@gmail.com
stefanc-wx.github.io

Skills

- Adept in Python and several modules including NumPy, SciPy, Pandas, geoPandas, netCDF4, xarray, ECCodes, boto3 (and botocore), multiprocessing, datetime, and logging.

- Amazon Web Services (AWS) certified associate solutions architect in building solutions leveraging the Elastic Compute Cloud (EC2), Lambda, Fargate, Simple Storage (S3), Simple Notification Service (SNS), Simple Queue Service (SQS), FSx for Lustre, Elastic Fabric Adapter (EFA), CloudWatch, SAM, CodeCommit, CodeBuild, CodePipeline, DynamoDB, as well as the use of ParallelCluster for cloud high-performance computing (HPC) cluster creation and management.

- Well versed in the several different Linux environments with advanced knowledge of building, configuring, and optimizing cloud-based HPC environments for complex weather modeling and processing frameworks using CPUs and GPUs.

- Robust knowledge of numerical weather simulation systems such as the Weather Research and Forecasting (WRF) modeling system and Finite Volume Cubed-Sphere Global Forecast System (FV3GFS).

- Advanced understanding of meteorological datasets including data acquisition, file formatting (including netCDF, GRIB1/2, binary), metadata, data manipulation, and data organization.

- Familiarity with training, running, and validating deep learning weather models such as FourCastNet using tools like ECMWF ai-models and NVIDIA modulus on cloud-based GPU environments.

- Strong scientific research background on dynamical and mesoscale meteorology with an emphasis on understanding meteorological processes using numerical weather modeling and advanced statistical techniques.

- Effective communicator of complex scientific and technical processes and ideas through presentations, publications, patents, meetings, and proposals.

- Conducting day-to-day personnel and project management including task prioritization, planning, and guidance for multiple employees and projects.

Certifications and Achievements

- AWS Certified Solutions Architect: Associate; Valid Through Nov 26 2025 (Verification)

Experience

Maxar Intelligence (formerly Maxar)   Remote (in Maryland)

Principal Data Scientist and Engineer   *November 2022 – present*

- Spearheading and executing cloud-based weather modeling initiatives including the use of numerical weather models as well as deep learning weather model training and inferencing
- Prioritizing, leading, and planning strategic scientific research and development to unlock weather data for specific client use cases
- Technical lead for the award winning AWS cloud HPC solution developed by Maxar Technologies (Link)

Senior Data Scientist and Engineer   *July 2020 – November 2022*

- Leading, planning, and executing technical roadmaps for new products and initiatives
- Designing and implementing serverless cloud-based workflows for real-time data processing and analysis

Data Scientist and Engineer   *July 2018 – July 2020*
  – Building cloud-based (AWS) parallelized processing and extraction environments to support client-focused solutions
  – Architecting and maintaining cloud HPC numerical weather prediction systems and workflows
  – Migrating and refactoring meteorological data processing and delivery applications for use in AWS

Cherokee Nation Businesses (NOAA Contractor)   Silver Spring, MD
Scientist III   *March 2018 – July 2018*
  – Supported the National Earth System Prediction Capability (ESPC) through scientific, technological, and strategic guidance
  – Helped identify, synthesize, and promote state-of-the-art research for operational use

Weather Analytics   Washington, DC
Vice President for Earth Sciences   *May 2016 – March 2018*
  – Wrote patents, including creation of workflow diagrams, that focus on key scientific and data innovations created by the company
  – Spearheaded and managed strategic meteorological research and development initiatives critical to the improvement of the company's product line
  – Created and maintained several scientific computational environments, including HPC clusters, within AWS
  – Generated technological plans and cost estimates for business development and product innovation
  – Led a team of meteorologists in the development and implementation of business-related weather solutions
  – Oversaw day-to-day operations of several employees, products, and research-to-operation projects

Vice President of Scientific Solutions   *February 2016 – May 2016*
  – Led several initiatives to enhance and create new weather applications for clients
  – Managed team prioritization of numerous scientific research-to-operation projects
  – Designed innovative approaches for the acquisition, curation, processing, and storage of new meteorological datasets
  – Prepared proposals to secure business through Small Business Innovation Research (SBIR) solicitations

Senior Director of Scientific Modeling   *September 2015 – February 2016*
  – Supervised a team of meteorologists and projects focused on enhancing existing business weather solutions
  – Developed customized versions of short-term weather forecasting systems using the WRF model within AWS EC2

Education

Doctor of Philosophy, Atmospheric and Oceanic Science   May 2014
University of Maryland, College Park   *College Park, MD*
  – **2012 NASA Earth and Space Science Fellowship (NESSF) Recipient**
    * Proposal: *An Investigation of Tropical Cyclogenesis From African Easterly Waves*
    * Renewed for the 2013 and 2014 academic years
  – **2012 Eugene Rasmusson Fellowship Award Recipient**
    * Awarded annually by the Department of Atmospheric and Oceanic Science to an outstanding student who has advanced to candidacy

Master of Science, Atmospheric and Oceanic Science   May 2012
University of Maryland, College Park   *College Park, MD*

Bachelor of Science, Meteorology and Minor in Mathematics   May 2009
Millersville University of Pennsylvania   *Millersville, PA*

Selected Patents, Publications, and Presentations

S. F. Cecelski et al., 2024: An Elastic Multiarchitecture Cloud-based High Performance Computing Environment for the Global Forecast System. 104th Annual American Meteorological Society Conference, Baltimore, MD, USA. Abstract.

S. F. Cecelski, 2019: Running HPC in the cloud for global Numerical Weather Prediction. AWS re:Invent 2019: Powering global-scale predictive intelligence using HPC on AWS (AIM227-S), Las Vegas, NV, USA. Recording; Presentation.

Cousins, E. D. and **S. F. Cecelski**, inventors; Athenium LLC, assignee. 2023, May 9. Automated processing and combination of weather data sources for weather severity and risk scoring. United States patent 11,644,597.

Cousins, E. D. and **S. F. Cecelski**, inventors; Athenium LLC, assignee. 2021, Mar 30. Automated Severity-Based Risk Scoring for Ice Storms and Freezing Rain. United States patent 10,962,681.

Cousins, E. D. and **S. F. Cecelski**, inventors; Athenium LLC, assignee. 2020, Jan 14. Formulation and Delivery of Dynamic, Severity-Based Weather Peril Scoring. United States patent 10,534,784.

Cecelski, S. F., L. A. Munchak, and S. T. Daigneault, inventors; Athenium LLC, assignee. 2017, Oct 11. Corrective Ensemble Forecasting System for Tropical Cyclones. United States patent application 15/666,959.

Jones, J., L. A. Munchak, and **S. F. Cecelski**, inventors; Athenium LLC, assignee. 2017, Aug 30. Radar Artifact Reduction System for the Detection of Hydrometeors. United States patent application 15/690,746.

Cecelski, S. F. and D.-L. Zhang, 2016: Genesis of Hurricane Julia (2010) within an African Easterly Wave: Sensitivity to ice microphysics. *Journal of Applied Meteorology and Climatology*, **55**, 79-92.

Cecelski, S., 2015: Python, Weather Data, and Amazon's Cloud Computing Services. 2015 Unidata Users Workshop - Data-Driven Geoscience: Applications, Opportunities, Trends, and Challenges, Boulder, CO, USA.

Zhu, L., D.-L. Zhang, **S. F. Cecelski**, and X. Shen, 2015: Genesis of Tropical Storm Debby (2006) within an African Easterly wave: Roles of the bottom-up and midlevel pouch processes. *Journal of the Atmospheric Sciences,* **72**, 2267-2285.

Cecelski, S. F., 2014: On The Genesis and Predictability of Hurricane Julia (2010). University of Maryland, http://hdl.handle.net/1903/15241, 195 pp.

Cecelski, S. F. and D.-L. Zhang, 2014: Genesis of Hurricane Julia (2010) within an African Easterly Wave: Sensitivity Analyses of WRF-LETKF Ensemble Forecasts. *Journal of the Atmospheric Sciences,* **71**, 3180-3201.

Cecelski, S. F., D.-L. Zhang, and T. Myoshi, 2014: Genesis of Hurricane Julia (2010) within an African Easterly Wave: Developing and Non-Developing Members from WRF-LETKF Ensemble Forecasts. *Journal of the Atmospheric Sciences*, **71**, 2763-2781.

Cecelski, S. F. and D.-L. Zhang, 2013: Genesis of Hurricane Julia (2010) within an African Easterly Wave: Low-Level Vortices and Upper-Level Warming. *Journal of the Atmospheric Sciences*, **70**, 3799-3817.