

DILLON ELSBURY

Boulder, CO; linkedin.com/in/dillone9; Google Scholar profile

OVERVIEW

Data scientist and atmospheric researcher with 10 years of experience developing statistical and physics-based models, scalable geospatial pipelines, and predictive tools for weather and climate data. Skilled in Python and large-scale ETL workflows, with a record of turning complex analyses into actionable insights across weather, subseasonal, and seasonal-climate timescales.

CORE SKILLS

- Programming & Tools:** Python (Pandas, Numpy, Scipy, Xarray, Dask, multiprocessing, statsmodels, scikit-learn, TensorFlow, Keras), MATLAB, Rust, SQL, Bash/Linux, Jupyter, Conda/UV, GitHub, NetCDF, Zarr, GRIB, Geographic Information System (GIS)
- Statistical & ML Methods:** Anomaly detection, uncertainty quantification, bootstrapping, causal inference, experiment design, predictive modeling, hypothesis test design, regression, matrix decomposition (EOF/PCA/SVD), spectral analysis, clustering, statistical modeling
- Data Infrastructure & Engineering:** AWS S3 Cloud, Runpod, HPC with Slurm, distributed computing, parallelization, CI/CD familiarity
- Visualization & Communication:** Python (Matplotlib, Seaborn) PowerPoint, Excel, reproducible documentation (Word, Google Docs, Overleaf), technical reports, oral presentations, leverages LLMs to refine writing

EXPERIENCE

Cooperative Institute (CIRES) and NOAA Chemical Sciences Laboratory Jul 2021 – Aug 2025

Research Scientist 2, advised by Dr. Amy H. Butler

Boulder, Colorado

- Summary: Engineered scalable ETL/ELT pipelines with Python and Bash to acquire and transform 1-100 terabyte observational, climate model, and numerical weather prediction datasets; conducted end-to-end analysis and data visualization of aforementioned datasets using Xarray, Dask, Pandas, Jupyter, and Matplotlib; delivered insights, metrics, and dashboards in technical reports and presentations to senior leadership.
- Collaborated with cross-functional teams (scientists, engineers, statisticians, developers) to deliver public-facing GitHub-based [diagnostics](#) to NOAA's Model Diagnostics Task Force, enabling rapid evaluation of weather model biases; supported adoption of analytics workflows by providing Python code, Conda environments, and documentation for teammates unfamiliar with Python.
- Applied statistical and ML methods (PCA, clustering, spectral analysis, regression, bootstrapping) to detect anomalies, quantify uncertainty, and extract predictive features out of noisy high-dimensional (6D) time series data.
- Developed statistical models for seasonal weather prediction using regression and feature engineering, achieving skill comparable to physics-based models, helping to translate retrospective analyses into forward-looking insights.
- Delivered scientific findings via 9 peer-reviewed publications and stakeholder presentations internally and at conferences (AMS, AGU, EGU); tailored communication to technical and non-technical audiences, driving data-informed decisions across teams.

UCI Department of Earth System Science Sep 2016 – Jun 2021

Graduate Research Assistant, advised by Dr. Gudrun Magnusdottir

Irvine, California

- Dissertation: The effect of low-frequency climate variability on stratosphere-troposphere coupling during boreal winter.
- Designed and ran climate model simulations to diagnose how slowly evolving changes in tropical ocean temperature and tropical weather affect seasonal weather extremes over continents, culminating in 3 peer-reviewed publications.
- Built academic foundations in applied math, physics, and statistics, alongside expertise in ETL/ELT pipeline development, Python-based scientific analysis, data visualization, and statistical testing; taught undergraduate courses and led STEM outreach for middle and high school students.

UCSB Bren School of Environmental Science & Management Jun 2015 – Sep 2016

Staff Research Associate, advised by Dr. Arturo Keller

Santa Barbara, California

- Built models using Python/MATLAB and GIS to simulate pollutant transport within watersheds and cities; validated outputs against observational data; collaborated with academic and industry partners to translate models into decision-support tools.

NASA Jet Propulsion Laboratory Summers of 2014, 2013, 2012, 2010

Intern, advised by Dr. Gregory Osterman & Dr. Amy Mainzer

La Canada Flintridge, California

- Performed quality control of Python/SQL data pipelines that integrated satellite and ground-based data into our systems.
- Delivered analyses to support operations and conducted exploratory data analysis on remotely sensed datasets to extract patterns and trends.

EDUCATION

PhD & Master's B.S.	Earth System Science Environmental Studies	University of California, Irvine (UCI) University of California, Santa Barbara (UCSB)	Sep 2016 – Jun 2021 Sep 2011 – Jun 2015
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SELECTED ACHIEVEMENTS

- Principal Investigator:** (NOAA Climate Program Office, 2023–2025): Secured and led a \$500K+ multi-institutional project on near-term climate and extreme weather projections.
- Fellowships & Awards:** NSF Graduate Research Fellow (2017-2020), NSF Research Traineeship Grant for ML and Physical Science (2017-2019), AMS Hooke Fellow in Policy and Leadership (2022)
- Publications:** Author of 12 peer-reviewed publications on retrospective and forward looking climate & weather analyses and enhancing predictability of weather; frequent presenter at conferences (AMS, AGU, EGU). [See publications at Google Scholar](#)