

Brian Kao

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EDUCATION

Uppsala University, *M.Sc. Physics – Meteorology & Climate Physics* Uppsala, Sweden | **Expected June 2028**

Brown University, *B.Sc. Geophysics and Climate Physics with Honors*, 3.90/4.00 GPA Providence, RI | May 2026

- *Computational Science: Deep Learning, Machine Learning, Time Series Analysis and Modeling in Climate Sciences*, Intro to Methods in Data Analysis, Natural Sciences Modelling, Spatial Data Science
- *Climate Dynamics: Tackling Climate Change with Machine Learning, Climate Modeling I & II, Dynamic Meteorology*, Geophysical Fluid Dynamics, Ocean Circulation and Climate, Global Water Cycle

SKILLS & INTERESTS

Programming: Python (NumPy, Xarray, Pandas, Matplotlib, PyTorch), R, MATLAB, HPC (JupyterLab, Dask)

Geospatial/GIS: ArcGIS, QGIS, GeoPandas, ENVI, Google Earth Engine, NetCDF (ERA5, CESM, IBTrACS), SQL

Languages: English, Mandarin (bilingual), Spanish (intermediate; DELE B1 certified), German, Latin (basic)

Interests: Photography (14-year experience), Hiking, Cycling, Badminton

PROFESSIONAL & RESEARCH

Academia Sinica @ Taipei, Taiwan

Intern & Research Collaborator, *Institute of Earth Sciences*

Jun 2023 – Present

- Investigate intense urban stratosphere-troposphere exchange during typhoon events in northern Taiwan
- Collect air samples and analyzed surface CO₂ stable oxygen isotopes with ERA5 reanalysis fields

Brown University @ Providence, RI

Advanced Undergrad Research Fellow, *Department of Earth, Environmental, and Planetary Sciences*

Nov 2023 – May 2026

- Coupled CESM2 outputs with SNOWPACK to assess risk of critical snow structure shifts to Indigenous pastoralism
- Scaled multi-decadal simulations across 2.3 million km² on NCAR supercomputers
- Accelerated runtime by refactoring existing workflows to support parallel processing and vegetation parameterization

GIS & Data Assistant, *Library GIS & Data Services*

Sep 2025 – May 2026

- Developed Python scripts utilizing SQL queries to streamline spatial data processing and analysis
- Modernized Brown GIS tutorials for ADA compliance and safeguarded 400+ delisted federal and state GIS datasets
- Advised faculty and researchers on geospatial methodology and dataset selection

National Science and Technology Center for Disaster Reduction @ Taipei, Taiwan

Intern, *Meteorology Division*

Jul 2025

- Led team to engineer a proof-of-concept XGBoost model for 96-hour typhoon trajectory and intensity prediction
- Trained model on Taiwan 2 HPC in CUDA, fusing IBTrACS records with CNN-autoencoded ERA5 latent vectors
- Achieved 150-km 24-hr accuracy, validated feature importance, and co-developed real-time web visualization

University of Bonn @ Bonn, Germany

DAAD RISE Germany Scholar, *Institute of Geodesy and Geoinformation*

Jun 2024 – Aug 2024

- Assessed global land models & GRACE assimilation performance to enhance European drought monitoring
- Analyzed drought evolution using Terrestrial Water Storage-Drought Severity Index on FZ Jülich supercomputer
- Implemented HDBSCAN learning to segment and track spatial-temporal propagation of severe drought events

LEADERSHIP

Brown Taiwan Society @ Providence, RI

Co-President, Secretary & Senior Advisor

Aug 2023 – May 2026

- Organized annual cultural markets involving 20 student organizations, 5 sponsors, 70+ performers, and 1000+ visitors
- Strategized and negotiated market item pricing, entry ticket plans, and inter-club profit distributions

PUBLICATIONS & PRESENTATIONS

Lead Author, (*Under review*). Snowpack Projections for Siberian Indigenous Reindeer Herding in Sakha: CESM2-Driven Localized Simulations. To be submitted to *Arctic, Antarctic, and Alpine Research*.

American Geophysical Union 2025 Annual Meeting, *Poster Presentation*

Lead Author, (2023). Measuring the Effects of Typhoon Trajectories on Dengue Outbreaks in Tropical Regions of Taiwan: 1998–2019. *International Journal of Biometeorology* 67, 1311–1322. <https://doi.org/10.1007/s00484-023-02498-0>