

Brian Kao

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EDUCATION

Brown University, B.Sc. Geophysics and Climate Physics, 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
- *Additional Advanced Electives: Intermediate Microeconomics, Investments I*

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

SELECTED 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>

PROFESSIONAL & RESEARCH EXPERIENCE

Brown Univ. Dept. of Earth, Environmental, and Planetary Sciences, Researcher Providence, RI | Nov 2023 – May 2026

- Predicting adverse snow condition shifts in Sakha, Russia to assess climate change impact on Indigenous reindeer husbandry
- Modeling snow structures with CESM2 outputs and SNOWPACK model over 2.3 million km² on NCAR HPC at Lynch Lab
- Optimized literature methodology by incorporating common vegetation types and parallel computing in model simulation
- Navigated relationships with collaborators from multiple institutions and delicate discussions on conference comments

Brown Univ. Library GIS & Data Services, GIS & Data Assistant

Providence, RI | Sep 2025 – May 2026

- Implemented Data Rescue Project initiative to archive 400+ delisted federal and state GIS datasets
- Developing Python scripts with SQL dataset queries to streamline spatial data processing and analysis for library projects
- Providing technical GIS solutions and spatial data consultation for faculty and students across disciplines
- Authoring advanced QGIS tutorials and modernizing Brown University Library GIS resources for ADA compliance

National Science and Technology Center for Disaster Reduction (NCDR), Summer Intern

Taipei, Taiwan | Jul 2025

- Proposed and led a team to engineer a proof-of-concept 96-hour XGBoost typhoon trajectory and intensity model
- Trained the model using historical trajectories and CNN-Autoencoded ERA5 data in CUDA environment on Taiwan 2 HPC
- Achieved 150-km accuracy for 24-hour window in Western North Pacific and validated the model with feature importance
- Collaborated on building an automated web visualization tool for real-time model predictions

Univ. of Bonn Inst. of Geodesy and Geoinformation, DAAD RISE Germany Scholar

Bonn, Germany | Jun 2024 – Aug 2024

- Compared global land surface model and GRACE assimilation for their potential in a European drought monitoring system
- Analyzed drought evolution using Terrestrial Water Storage-Drought Severity Index on exascale supercomputer JUPITER
- Proposed and experimented with HDBSCAN to identify spatial and temporal propagation of large-scale drought events

Academia Sinica Institute of Earth Sciences, Undergraduate Summer Intern

Taipei, Taiwan | Jun 2023 – Feb 2024

- Explored the causal connection between typhoon events and stratosphere-troposphere exchange in northern Taiwan
- Collected local air samples and analyzed surface CO₂ stable oxygen isotopes observations with ERA5 reanalysis fields
- Delivered findings at presentation and poster symposium open to all Institute faculty with animated maps & vertical profiles
- Independently authored a comprehensive manuscript post-internship

LEADERSHIP EXPERIENCE

Brown Taiwan Society, Co-President, Secretary & Senior Advisor

Providence, RI | Aug 2023 – May 2026

- Organized annual “Night Markets” involving 20 student organizations, 5 sponsors, 70+ performers, and 1000+ participants
- Strategized and negotiated “Night Market” entry ticket plans, Market item pricing, and inter-club profit distributions
- Designed monthly cultural activities and joint events with Brown student organizations and structured preparation timeline
- Presided over weekly executive board meetings and coordinated with Brown Student Activities Office for event approval