HUSILE BAI

Assistant Professor of the Practice
Earth & Environmental Sciences, Vanderbilt University
husile.bai@vanderbilt.edu | *https://husilebai.github.io*

RESEARCH INTERESTS

Atmospheric dynamics, climate dynamics and variability, regional and global climate modeling, Earth system modeling, surface-atmosphere interactions, cloud microphysics, hydroclimate, cryosphere

PROFESSIONAL EXPERIENCE

2024 - **Assistant Professor of Practice**, Vanderbilt University
Department of Earth and Environmental Sciences

2023-2024 **Postdoctoral Research Fellow**, University of Utah
Department of Geography

EDUCATION BACKGROUND

2018-2022 **Ph.D. University of Utah, Department of Atmospheric Sciences**
Advisor: Dr. Courtenay Strong
Dissertation project: *Teleconnection mechanisms associated with ecologically-relevant climate dipoles*

2015-2018 **M.S. University of Chinese Academy of Sciences, Institute of Earth Environment**
Advisors: Dr. Guohui Li and Dr. Yu Liu
Thesis project: *Impact of the ice nuclei on the development of the cumulus clouds over the North China Plain*

2011-2015 **B.S. Lanzhou University, College of Atmospheric Sciences**
Advisor: Dr. Yi Yang
Capstone project: *Numerical weather simulation and analysis of a heavy rainstorm*

PUBLICATIONS

1. **Husile Bai,** Olivia Mondlock, Courtenay Strong, Jalene M. LaMontagne, and Benjamin Zuckerberg. Probabilistic theory for episodic ecological events. (*under review*)
2. **Husile Bai,** Summer Rupper, and Courtenay Strong. Glaciers matter for getting the weather and climate right. (*submitted*)
3. **Husile Bai,** Courtenay Strong, Jalene M. LaMontagne, Ivy V. Widick, and Benjamin Zuckerberg. A North American climate-masting-irruption teleconnection and its change under global warming, *Science of The Total Environment*, 948, 174473, https://doi.org/10.1016/j.scitotenv.2024.174473
4. Jalene M. LaMontagne, Courtenay Strong, **Husile Bai**, Jessie J. Forest, Andrew Hacket-Pain, Mark Schulze, and Benjamin Zuckerberg, Atmospheric waves synchronize and desynchronize mast seeding at a hemispheric scale, (*submitted*)
5. Luke Stone, Courtenay Strong, **Husile Bai**, Thomas Reichler, Greg McCabe, and Paul D. Brooks (2023). Atlantic Ocean influence on western U.S. hydroclimate and water resources, *npj Climate and Atmospheric Science*, 6, 139, https://doi.org/10.1038/s41612-023-00471-7

6. **Husile Bai** and Courtenay Strong (2023). Atmospheric modeling study on convection-triggered teleconnections driving the summer North American dipole, *Journal of Climate,* 36, 6991–7003, https://doi.org/10.1175/JCLI-D-23-0015.1
7. **Husile Bai**, Courtenay Strong, and Benjamin Zuckerberg (2023). Drivers of an ecologically relevant summer North American dipole, *Journal of Climate*, 36, 2387-2399, https://doi.org/10.1175/JCLI-D-22-0542.1
8. **Husile (**胡思乐**)**, Liu Yu, Li Guohui (2019). Impact of ice nuclei on the development of cumulus clouds over the North China Plain, *Journal of Earth Environment*, 10(3):257-266 (in Chinese) https://doi.org/10.7515/JEE182078
9. **Husile (**胡思乐**)**, Li Yan, Fang Congxi, Chen Zhihong (2018). The relationship between Ural blocking, Siberian high, and East Asian winter monsoon, *Journal of Lanzhou University (natural sciences)*, 54(4):440-452 (in Chinese) https://doi.org/10.13885/j.issn.0455-2059.2018.04.003
10. Yu Liu, Weiyuan Ta, Qiang Li, Huiming Song, Changfeng Sun, Qiufang Cai, Han Liu, Lu Wang, **Hu Sile**, Junyan Sun, Wenbiao Zhang, Wenzhu Li (2018). Tree-ring stable carbon isotope-based April-June relative humidity reconstruction since AD 1648 in Mt. Tianmu, China, *Climate Dynamics*, 50, 1733–1745, https://doi.org/10.1007/s00382-017-3718-6
11. Yu Liu, Han Liu, Huiming Song, Qiang Li, George S. Burr, Lu Wang, and **Hu Sile** (2017). A monsoon-related 174-year relative humidity record from tree-ring δ18O in the Yaoshan region, eastern central China, *Science of the Total Environment*, 593: 523-534, https://doi.org/10.1016/j.scitotenv.2017.03.198

PUBLICATIONS IN PREPARATION

1. **Husile Bai,** Jonathan Maurer, Summer Rupper, and Daniel Shapero. Modeling study of the dynamic and momentum balance of mountain glaciers.

PRESENTATIONS

Invited talks

2024

- Global radiative heat balance, *Earth and Environmental Sciences*, **Vanderbilt University**
- Unexpected control of hydroclimate variability, *Civil and Environmental Engineering Graduate Seminar*, **Rutgers University**
- Unexpected control on climate variability. *Geography Research of the Week*, University of Utah

2023

- Dynamics of mountain glaciers in the changing climate. MAGIC workshop, Lamont-Doherty Earth Observatory, **Columbia University**

Poster & oral presentation

2024

- **Husile Bai.** From data to delight: exploring Earth & climate through interdisciplinary visualization and programming, *Lightning talk*, Spatial Utah Data Science Lightning Talk Series, Salt Lake City
- **Husile Bai**, Courtenay Strong, Jalene M. LaMontagne, Ivy V. Widick, and Benjamin Zuckerberge. A North American climate-masting-irruption teleconnection and its change under global warming. *Poster*, Macrosystems PI Annual Meeting, Virtual

2023

- **Husile Bai**, Summer Rupper, Courtenay Strong. Effect of glaciers on orographic and synoptic-scale atmospheric circulations. *Poster* , AGU Fall Meeting, San Francisco

- **Husile Bai**, Summer Rupper, and Courtenay strong. Downscaling with glacier-adjusted WRF in the Karakoram region. *Oral presentation*, NASA HiMAT workshop, Salt Lake City

2022

- **Husile Bai**, Courtenay Strong, Jalene M. LaMontagne, and Benjamin Zuckerberg. Summer North American dipole driven by stationary Rossby waves associated with tropical and monsoonal convection. *Poster*, AGU Fall Meeting, Chicago

2021

- **Husile Bai**, Courtenay Strong, Benjamin Zuckerberg, and Jalene M. LaMontagne. Continental-scale climate dipoles driven by pan-Pacific waves. *Poster*, AGU Fall Meeting, New Orleans
- **Husile Bai**, Courtenay Strong, Benjamin Zuckerberg, and Jalene M. LaMontagne. Global teleconnections of west-east pine siskin irruption mode. *Poster*, at Macrosystems PI Annual Meeting, Virtual

2017

- **Husile**, Liu-Yu, Li-Guohui. Impact of ice nuclei on the development of cumulus clouds over the North China Plain. *Oral presentation*, AGU Fall Meeting, New Orleans

Contributed presentations

2024

- Jalene M. LaMontagne, Courtenay Strong, **Husile Bai**, Jessie J. Forest, Andrew Hacket-Pain, Mark Schulze, and Benjamin Zuckerberg, Atmospheric waves synchronize and desynchronize mast seeding at a hemispheric scale. *Poster,* Macrosystems PI Annual Meeting, Virtual
- Zoe Exelbert, Courtenay Strong, **Husile Bai**. Climate Vulnerability Assessment of the Great Salt Lake on Migration Patterns. *Poster*, Research Day on the Hill, Salt Lake City

2023

- Zoe Exelbert, Courtenay Strong, **Husile Bai**. Hydroclimate Variability Assessment of the Great Salt Lake on Bird Migratory Patterns. *Poster* , Wilkes Climate Summit, Salt Lake City

2022

- Ivy Widick, **Husile Bai**, Courtenay Strong, Jalene M. LaMontagne, and Benjamin Zuckerberg. Climate Dipoles entrain ecological dipoles: irruption dynamics of boreal finches. *Oral presentation*, AGU Fall Meeting, Chicago
- Kevin Anthony Mendoza, Alysha Armstrong, Sam Bagge, **Husile Bai**, Eric Humphrey, Chantelle Kiessner, Emily Hope Chuningham, Monique Maria Holt, Jory Lerback, Gabriela St. Pierre. "*Student Resiliency and Advancement of DEI Objectives Through Leadership Change and Pandemic Uncertainties: Perspectives from Inclusive Earth*". *Lighting Talk*, AGU 2022 Fall Meeting, Chicago

TRAINING AND WORKSHOPS

- DELPHI Natural Language Processing (NLP) with applications to clinical data science workshop, March 2024, University of Utah Health, Salt Lake City, UT
- MAGIC AI/ML workshop, February 2024, University of Utah, Salt Lake City, UT
- European Geosciences Union (EGU) Peer Review Training, September- October, 2023, *Virtual*
- Weather Research & Forecasting (WRF) tutorial, July 2023, NCAR Foothills Laboratory, Boulder, CO
- MAGIC workshop, June 2023, Lamont-Doherty Earth Observatory, Columbia University, New York, NY
- NASA HiMAT workshop, June 2023, University of Utah, Salt Lake City, UT

- 2nd US Ice Core Open Science Meeting, May 2023, University of Washington. Seattle, WA
- *ICEPACK* glacier model training, May 2023, University of Washington, Seattle, WA
- MOOC machine learning in weather and climate training, January-April, 2023, European Centre for Medium-Range Weather Forecast (ECMWF) & International Foundation Big Data Artificial Intelligence for Human Development (IFAB), *Virtual*
- Research Mentoring training, August 2022 - March 2023, Research Education (REd), University of Utah, *Virtual*
- AGU Chapman Conference Second National Conference: Justice in Geoscience, August 2022, Washington, DC
- 12th Annual Utah Snow and Avalanche Workshop (USAW), November 2019, Utah Avalanche center, Salt Lake City, UT

GRANT AND AWARDS

2023 Dr. Norihiko Fukuta Memorial Award Best Peer-Reviewed Publication, Department of Atmospheric Sciences, University of Utah (*$1.5K*)
2023 Poster Evaluator, Office of Undergraduate Research, University of Utah (*0.3K*)
2022 AGU Chapman Conference Second National Conference travel grant ($*2.5K*)
2022 Rockstars Student Service Award, Department of Geology & Geophysics, University of Utah
2021 University of Utah Graduate Student Travel Award ($*0.5K*)

MENTORING AND TEACHING

Mentoring experience

Olivia Mondlock, co-mentored Capstone project in the Department of Atmospheric Sciences, University of Utah, 2021-2022
Zoe Exelbert, co-mentored Wilkes Scholar undergraduate project in the Department of Atmospheric Sciences, University of Utah, Jan 2023 -2024

Teaching experiences

University of Utah, Department of Geography

GEOG 3020	Geographical Analysis	Spring 2024	Lab Instructor: Teach student statistics, design lab sections, programming with R/Python
GEOG 5410	Paleoclimatology	Spring 2024	Guest lecture: climate pattern analysis, Teach student EOF (PCA) analysis using reanalysis data, programming with Python

Salt Lake Community College, Department of Geosciences

ATMO 1020	Climate Change	Summer 2022	Adjunct: Teach student virtually, office hours, project design

University of Utah, Department of Atmospheric Sciences

ATMOS 5400	The Climate System	Fall 2021 Fall 2020	TA: Assisted students in homeworks, hosted exam review sessions

ATMOS 6040	Environmental Statistics	Spring 2021	TA: Assisted students in software operation (Matlab and Python)

SERVICE AND OUTREACH

2023 - Serving as *Postdoc Success Chair* in the Utah Postdoctoral Association (UPDA), University of Utah

2022 - *Observer & Member* of Board of Higher Education for 2-year College, American Meteorological Society (AMS BHE 2YC)

Summer 2022 Volunteered to teach the Climate Change course as an *Adjunct* at the Geoscience Department in Salt Lake Community College

2020-2022 Assisted as *committee member* in the Committee for the Advancement of Inclusion and Diversity (CAID), College of Mines and Earth Sciences, University of Utah, 2020-2022

2021-2022 *Inclusive Earth officer* (social media promotion), College of Mines and Earth Sciences, University of Utah, 2021-2022

MEMBERSHIP

American Geophysical Union (AGU) member
American Meteorological Society (AMS) member
European Geosciences Union (EGU) member
American Center for Mongolian Studies (ACMS) member

PROFESSIONAL SKILLS

Statistical and modeling techniques:

- Weather Research and Forecasting (WRF) model
- Global climate models (GCM), including Community Earth System model (CESM), Geophysical Fluid Dynamics Laboratory (GFDL) Climate Model, and Coupled Model Intercomparison Project phase 6 (CMIP6)
- Land Information System (LIS) Framework
- Fu-Liou radiative transfer model
- *ICEPACK* glacier dynamics model
- Programming languages: NCL, Matlab, Python, R, Fortran, IDL, JeKyll, CDO
- In addition, I am familiar with a wide range of techniques and programs for data analysis and simulation under Unix (Linux) and Mac OS environments.

Other:

- I am fluent in Mongolian (native), English, and Mandarin Chinese, and have given presentations and taught in all three languages.