

HUSILE BAI

Postdoctoral Research Fellow
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RESEARCH INTERESTS

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

PROFESSIONAL TRAINING

2023.01- Postdoctoral Research Associate 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. (*submitted*)
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. (*submitted*)
4. **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>
5. **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>
6. **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>

7. **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>
8. Jalene M. LaMontagne, Courtenay Strong, **Husile Bai**, Jessie J. Forest, Andrew Hackett-Pain, Mark Schulze, and Benjamin Zuckerberg (2023), Atmospheric waves synchronize and desynchronize mast seeding at a hemispheric scale, (*submitted*)
9. 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>
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 $\delta^{18}\text{O}$ 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.

RESEARCH EXPERIENCE

2023 (Jan) -	Dynamic downscaling over the complex terrain using Weather Research and Forecasting model (WRF) Glacier dynamic modeling using <i>ICEPACK</i> model
2020-2022	Studied atmospheric teleconnections influencing ecological processes including bird irruption and seed masting Investigated the response of atmospheric circulation to the sea surface temperature perturbations using Community Earth System Model 2 (CESM2)
2019-2020	Studied land surface processes using Land Information System (LIS) framework
2017-2018	Studied microphysics of clouds. Specifically, investigated the aerosol-cloud interactions using Cloud Resolving Weather Research and Forecasting (CR-WRF) model
2016-2017	Participated in the dendroclimatology fieldwork Tained in the dendroclimatology lab: tree-ring cross-dating and data processing
2015-2016	Trained LINUX operating system Analyzed satellite and Doppler radar products

TEACHING EXPERIENCE

University of Utah, Department of Geography

GEOG 3020	Geographical Analysis	Spring 2024	Lab Instructor: Teach student statistics, design lab sections, data analysis with R
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Salt Lake Community College, Department of Geosciences

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

MENTORSHIP

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 - present

PRESENTATIONS

- **Husile Bai**, Summer Rupper, Courtenay Strong. Effect of glaciers on orographic and synoptic-scale atmospheric circulations. Poster, AGU Fall Meeting, In-person, San Francisco, December 11-15, 2023
- **Husile Bai**, Jonathan Mauer, Summer Rupper, and Daniel Shapero. Dynamics of mountain glaciers in the changing climate. Invited talk, MAGIC workshop, In-person, New York, 27-29 June 2023
- **Husile Bai**, Summer Rupper, and Courtenay strong. Downscaling with glacier-adjusted WRF in the Karakoram region. Oral presentation, NASA HiMAT workshop, In-person, Salt Lake City, June 20-22, 2023
- **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, In-person, Chicago, December 12-16, 2022
- **Husile Bai**, Courtenay Strong, Benjamin Zuckerberg, and Jalene M. LaMontagne. Continental-scale climate dipoles driven by pan-Pacific waves. Poster, AGU Fall Meeting, In-person, New Orleans, December 13-17, 2021
- **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, January 13-14, 2021
- **Hu-sile**, 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, December 11-15, 2017

CONTRIBUTED PRESENTATIONS

- Zoe Exelbert, Courtenay Strong, **Husile Bai**. Climate Vulnerability Assessment of the Great Salt Lake on Migration Patterns. *Poster*, Research Day on the Hill, In-person, Salt Lake City, January, 2024
- Zoe Exelbert, Courtenay Strong, **Husile Bai**. Hydroclimate Variability Assessment of the Great Salt Lake on Bird Migratory Patterns. *Poster*, Wilkes Climate Summit, In-person, Salt Lake City, May 16-17, 2023
- 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, In-person, December 12-16, 2022
- Kevin Anthony Mendoza, Alysha Armstrong, Sam Bagge, **Husile Bai**, Eric Humphrey, Chantelle Kiessner, Emily Hope Chunningham, 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, In-person, December 12-16, 2022

TRAINING AND WORKSHOPS

- 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)

SERVICE AND OUTREACH

- Serving as **board member** in the Utah Postdoctoral Association (UPDA), University of Utah, 2023 - present
- **Observer and Member** of Board of Higher Education for 2-year College, American Meteorological Society (AMS BHE 2YC), 2022 - present
- Volunteered to teach the Climate Change course as an **Adjunct** at the Geoscience Department in Salt Lake Community College, 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
- **Inclusive Earth officer** (social media promotion), College of Mines and Earth Sciences, University of Utah, 2021-2022

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, English, and Mandarin Chinese, and have given presentations and taught in all three languages.