

BEICHEN ZHANG

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PERSONAL PROFILE

Ph.D. candidate studying impacts of climate extremes, with 4+ years of experience in remote sensing and applied climatology, and 2+ years in data science and machine learning using Python, R, and related packages such as scikit-learn and PyTorch.

EDUCATION

Ph.D. in Natural Resource Sciences, University of Nebraska-Lincoln Expected Fall 2023

Specialized in Climate Assessment and Impacts, minor in Statistics

Dissertation topics: Monitoring and Assessing Drought Impacts using Machine Learning and Geomatics

M.S. in Natural Resource Sciences, University of Nebraska-Lincoln 2017 - 2019

Specialized in Climate Assessment and Impacts

Thesis: Investigation of GRACE-derived Information on Forest Drought Stress Across the Contiguous U.S

B.S. in Geographic Information Science, Northwest A&F University (Yangling, China) 2013 - 2017

RESEARCH EXPERIENCE

Graduate Research Assistant August 2022 - Present

Daugherty Water for Food Global Institute, National Drought Mitigation Center *Lincoln, NE*

- Research fellowship from the DWFI. Developing studies on associations between climate extremes and mortality using ML and causal inference, collaborating with researchers in public health and statistics.

Research Intern Jun 2022 - Aug 2022

Frontier Development Lab USA (Funded by NASA and DOE) *Mountain View, CA*

- The core researcher of an interdisciplinary team studying wildfires using multispectral satellite imagery and ML. Built a self-supervised model to detect changes of the burned areas and evaluate burned severity.

Graduate Research Assistant August 2019 - May 2022

National Drought Mitigation Center *Lincoln, NE*

- Developed a study to investigate causal relationships between climate extremes and social unrest in South Asia.
- Developed a study to recognize drought impacts from Twitter data using fine-tuned BERT.
- Built an explainable ML framework to predict and assess complex drought impacts using XGBoost and SHAP.

TEACHING EXPERIENCE

Applications of Remote Sensing in Agriculture and Natural Resources, lab instructor Jan 2022 - May 2022

Introduction to Remote Sensing, lab instructor Aug 2021 - Dec 2021

Introduction to Geospatial Technologies, lab instructor Aug 2019 - May 2021

PUBLICATIONS

Zhang, B., Abu Salem, K F., Hayes, M., Smith, K., & Tadesse, T. Explainable Machine Learning Applications to Predict and Assess Complex Drought Impacts based on a Multi-sourced Dataset (*In Progress*)

Werum, R., Hayes, M., Schaefer, D., & **Zhang, B.** Climate Extremes and Protest in Asia: A Cross-Disciplinary Analysis of Protests in India, Pakistan and Bangladesh, 1995-2013 (*In Progress*)

Zhang, B., Wang, H., Alabri, A., Bot, K., McCall, C., Hamilton, D., & Růžicka, V. (2022). Unsupervised Wildfire Change Detection based on Contrastive Learning . *NeurIPS Workshop on Artificial Intelligence for Humanitarian Assistance and Disaster Response*. (*Accepted*)

Zhang, B., Schilder, F., Smith, K., Hayes, M., Harms, S., & Tadesse, T. (2021). TweetDrought: A Deep-Learning Drought Impacts Recognizer based on Twitter Data. *ICML Workshop on Tackling Climate Change with Machine Learning*.

Zhang, B., Abu Salem, K F., Hayes M., & Tadesse T. (2020). Quantitative Assessment of Drought Impacts Using XGBoost based on the Drought Impact Reporter. *NeurIPS Workshop on Tackling Climate Change with Machine Learning*.

Tadesse, T., Hollinger, D. Y., Bayissa, Y. A., Svoboda, M., Fuchs, B., **Zhang, B.**, ... & Richardson, A. D. (2020). Forest Drought Response Index (ForDRI): A New Combined Model to Monitor Forest Drought in the Eastern United States. *Remote Sensing*, 12(21), 3605.