BEICHEN ZHANG

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PERSONAL PROFILE

Ph.D. candidate studying impacts of climate extremes, with 5+ years of experience in remote sensing and applied climatology, and 3+ 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
Spicialized in Climate Assessment and Impacts, minor in Statistics
Dissertation topics: Monitoring and Assessing Drought Impacts using Machine Learning

M.S. in Natural Resource Sciences, University of Nebraska-Lincoln — 2017 - 2019
Spicialized 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 from environmental 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 research 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 identify 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., & Růžička, 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.