

# Mingzhou Shen

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## Education

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Ph.D. Energy, Environmental, and Food Economics, Pennsylvania State University	2025 (Expected)
M.S. Civil Engineering, Zhejiang University	Dec. 2019
B.E. Civil Engineering, Zhejiang University	Jun. 2016

## Research Interests

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Energy and Environmental Economics, Urban Economics, Labor Economics, Empirical Industrial Organization, Causal Inference

## Teaching Fields

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Microeconomics, Econometrics, Energy and Environmental Economics, Urban Economics, Geographic Information Systems, Applied Computational Economics, Empirical Industrial Organization, Machine Learning

## Job Market Paper

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**Drought responses in the Western United States: Household location choice and housing market feedback.**

*Abstract:* The Western U.S. faces a paradoxical challenge: rapid population growth amidst increasingly severe droughts, leading to a severe water crisis. This study employs a residential sorting model to analyze household location decisions and the associated welfare implications in response to drought risk from 2000 to 2020. A key innovation is the use of novel unmet water demand data that integrates the legal dimension of water allocation—water rights—with water availability for the first time. The findings reveal that households require significant compensation to move to areas with greater water scarcity. On average, they expect a 0.06% increase in annual wages to tolerate an additional cubic meter of unmet water demand, with households over 40 and homeowners demanding even higher compensation. The welfare impact is primarily driven by the direct disutility of water shortages rather than by housing cost shocks. These insights can inform policies addressing adaptation and equity concerns in the face of climate change.

## Publications

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### Journal Article in Economics

[1] Shen, M., Fisher-Vanden, K. and Wrenn, D.H., 2024. Impacts of Water-Related Building Moratoria on California's Housing Crisis. (forthcoming at *Land Economics*) [\[link\]](#)

### Journal Articles in Engineering (published prior to my transition to Economics)

- [1] Yi, N., Shen, M., Erdely, D. and Cheng, H., 2020. Stretchable gas sensors for detecting biomarkers from humans and exposed environments. *TrAC Trends in Analytical Chemistry*, 133, p.116085. [\[link\]](#)
- [2] Lü, C., Zhang, Y., Zhang, H., Zhang, Z., Shen, M. and Chen, Y., 2019. Generalized optimization method for energy conversion and storage efficiency of nanoscale flexible piezoelectric energy harvesters. *Energy Conversion and Management*, 182, pp.34-40. [\[link\]](#)
- [3] Zhang, H., Shen, M., Zhang, Y., Chen, Y. and Lü, C., 2018. Identification of static loading conditions using piezoelectric sensor arrays. *Journal of Applied Mechanics*, 85(1), p.011008. [\[link\]](#)

## Book

- [1] FAO and CAAS. 2021. Carbon neutral tea production in China – Three pilot case studies. *Food and Agriculture Organization of the United Nations*. (Contributor). [\[link\]](#)

## Working Papers and Work in Progress

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- [1] Shen, M. “How does drought shape land-use regulations? Evidence from the Wharton regulation survey.”
- [2] Shen, M. “Evaluating the effect of California statewide lawn watering ban on water conservation using remotely sensed data.”
- [3] Ma, Z. and Shen, M. “The impact of non-GMO labeling on consumer demand for wine: Evidence from a choice experiment.”

## Presentations

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- 2024 Association of Environmental and Resource Economists Summer Conference, Western Economic Association International Annual Conference, Agricultural & Applied Economics Association Annual Meeting, CU Environmental and Resource Economics Workshop, Penn State Water Conference, Penn State Energy and Environmental Economics and Policy Initiative Seminar
- 2023 Association of Environmental and Resource Economists Summer Conference, Western Economic Association International Annual Conference, Cornell Northeast Workshop on Energy Policy and Environmental Economics
- 2022 Environmental Politics and Governance Conference

## Research Experience

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- Pennsylvania State University, Research Assistant for Karen Fisher-Vanden 2021-present
- o Collaborated with an interdisciplinary team of modelers, hydrologists, and lawyer in the Program on Coupled Human and Earth Systems to study the impacts of drought on labor and housing markets in the Western U.S.

## Teaching Experience

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- CED 201: Introductory Environmental and Resource Economics. Douglas H. Wrenn. Spring 2024  
*Teaching Assistant and Guest Lecturer*
- EMCH 210: Statics and Strength of Materials. Samia Suliman. Spring 2021  
*Teaching Assistant*

## Professional Experience

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Food and Agriculture Organization of the United Nations (FAO) Feb. 2019-Nov. 2019  
*Specialist* Rome, Italy

- o Worked with a multidisciplinary team to develop a predictive model for estimating greenhouse gas emissions in tea production, laying the foundation for FAO's carbon-neutral tea certification.
- o Collaborated with the German Federal Ministry for Economic Cooperation and Development and the Chinese Academy of Agricultural Sciences to transfer tea planting technology to Kenya.
- o Supported small-scale farmers in rural Honduras in adopting agronomic practices to enhance their resilience to climate change.
- o Coordinated with national focal points to collect and synthesize statistics related to the Sustainable Development Goals, supporting global sustainability efforts to alleviate poverty and achieve zero hunger.

## Scholarships and Awards

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Graduate Student Travel Award, Pennsylvania State University 2024  
Longenecker Award, Pennsylvania State University 2020  
Outstanding Graduates, Zhejiang University 2016  
Corporate Scholarships for Outstanding Students, Enterprises 2015/2017/2018

## Service

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Referee

- o Western Economics Association International Annual Conference 2024

Member

- o Penn State Energy, Environmental, and Food Economics Graduate Student Association 2022-present
- o Penn State Water Council 2023-present
- o Penn State Alumni Association-Blue & White Society 2020-2023

## Skills

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Software: Python, R, MATLAB, Stata, ArcGIS, GAMS, Java

Certifications: Supervised Machine Learning: Regression and Classification (Stanford), Advanced Learning Algorithms (Stanford), Unsupervised Learning, Recommenders, Reinforcement Learning (Stanford), SQL for Data Science (UC Davis)

Languages: English (fluent), Mandarin (native)

## References

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**Dr. Karen Fisher-Vanden** (advisor)  
Distinguished Professor of Environmental and  
Resource Economics and Public Policy  
Pennsylvania State University  
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**Dr. Qin Fan**  
Professor of Economics  
California State University, Fresno  
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Resource Economics  
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