

# YAYUN (BIRDY) CHEN

Department of Agricultural Economics  
Texas A&M University  
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## RESEARCH INTERESTS

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Environmental and Agricultural Economics, Climate Risk and Agricultural Resilience, Energy and Bioeconomy Transitions, Applied Econometrics and Sector Modeling

## EMPLOYMENT

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**Associate Research Scientist**, Texas A&M University 2024- present  
**Postdoctoral Research Associate**, Texas A&M University 2024

## EDUCATION

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**Ph.D. in Agricultural Economics**, Texas A&M University 2020-2024  
*Dissertation:* Impacts of Hurricanes and Algae-based Jet Fuel on Energy Production Economics and Markets  
*Advisors:* James Mjelde & Bruce A. McCarl  
**M.A., Economics**, The University of Texas at Austin 2019  
**M.A., Economics**, National Tsing Hua University 2016  
**B.A., Economics (with Honors)**, Lanzhou University 2013

## PEER-REVIEWED PUBLICATIONS

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- [6] Bin, L., Q. Li, C. Hu, **Y. Chen**, Y. Zeng, S. Pearson, M. Liu, C. Fei, J.S. Yuan, and S.Y. Dai. 2025. "Remediation and upcycling of microplastics by algae with wastewater nutrient removal and bioproduction potential." *Nature Communications*, 16, 11570. <https://doi.org/10.1038/s41467-025-67543-5>
- [5] **Chen, Y.**, K. Chen, C. Fei, S.Y. Dai, and J.S. Yuan. 2025. "Life Cycle Assessment and Social Benefits of Producing Bioplastics via Integrating Electrochemical CO<sub>2</sub> Conversion and Microbial Fermentation." *ACS Sustainable Chemistry & Engineering*, 13, 21367-21379. <https://pubs.acs.org/doi/10.1021/acssuschemeng.5c02891>
- [4] Zhao, R., W. Li, J. Gonzalez-Aguirre, **Y. Chen**, J.S. Yuan, H. Pakrasi, C. Fei, S. Park, G. Roell, Y. Tang. 2025. "Development of Multimodal AI for Photobiorefineries via Knowledge Syntheses, Transfer Learning, and Techno-Economic Analysis" *Bioresource Technology*, 133646, ISSN 0960-8524. <https://doi.org/10.1016/j.biortech.2025.133646>.
- [3] **Chen, Y.**, X. Deng, C. Fei, B.A. McCarl, and Y. Xu. 2025. "Forecast-Based Disruptions in the Energy Sector: Economic Impacts of Anticipatory Hurricane Responses in U.S. Gulf Coast Refineries" *Environmental Research Letters*, 20, 114025. <https://doi.org/10.1088/1748-9326/ae0e3a>

- [2] Chen, K., P. Zhang, **Y. Chen**, C. Fei, J. Yu, J. Zhou, Y. Liang, W. Li, S. Xiang, S.Y. Dai, and J.S. Yuan. 2025. “Electro-biodiesel empowered by co-design of microorganism and electro-catalysis.” *Joule*, 9(1), 101769. <https://doi.org/10.1016/j.joule.2024.10.001>
- [1] Lin, N., **Y. Chen**, and M.P. Madariaga. 2024. “Route-to-market strategy for low-carbon hydrogen from natural gas in the Permian Basin.” *Fuel*, 355: 129420. <https://doi.org/10.1016/j.fuel.2023.129420>

## REPORTS

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- [1] IGU (2021), “Global Renewable and Low-Carbon Gas Report 2021 Edition.” *Global Renewable and Low-Carbon Gas Report*. Available at: <https://www.igu.org/advocacy/graphics-data/global-renewable-and-low-carbon-gas-report-2021>

## WORKING PAPERS

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- [1] **Chen, Y.**, L.C., Zhao, C.J. Fei, B.A. McCarl, D.D. Breshears, X. Feng, E. Baldwin, H. Cheng, J.J. Derbridge, J.D. Golding, A.M. Lien, L. López-Hoffman, D.M. McLaughlin, A.L.S. Swann, and J.R. Soto. “Agricultural Economic Implications of Climate: Linking Forest Loss to Agriculture Elsewhere in the U.S.” *Nature Communications*, R&R.
- [2] **Chen, Y.**, C. Fei, B.A. McCarl, J. Mjelde, and Y. Xu. “Regional Oil Production and Economic Impacts Due to Hurricanes’ Landfalls in the Gulf Coast Region.” (Targeted: *Journal of Environmental Economics and Management*)
- [3] **Chen, Y.**, C. Fei, B.A. McCarl, S.Y. Dai, B. Long, and J.S. Yuan. “Carbon Credits, Biofuel Incentives, and Input Market Responses in an Algae Based Agricultural Market Penetration Model.” (Targeted: *American Journal of Agricultural Economics*)
- [4] **Chen, Y.**, M. Liu, C. Fei, B.A. McCarl, and X. Wang. “Climate Stress and Structural Shifts in the U.S. Livestock Sector” (Targeted: *American Journal of Agricultural Economics*)
- [5] Wei, A., **Y. Chen**, Y. Xu, S. Li, S. Zhou, W. Gong, X. Ye, C. Fei, and H. X. Ye. “Continuous Economic Impacts of Wildfire Smoke on Real Estate Markets: A Case in Colorado.” *Nature Communications*, under review.

## INTERDISCIPLINARY PAPERS UNDER REVIEW

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- [1] Li, W., C. Hu, T. Zhu, **Y. Chen**, R. Zhang, P.S. Dhatt, J. Li, S. Xiang, C. Fei, M. Liu, S.Y. Dai, and J.S. Yuan. “Transforming Renewable Carbon Fiber Performance, Economics, and Sustainability via Oriented Crystallization Design.” Submitted to *Matter*.
- [2] Wei, W., Q. Hu, **Y. Chen**, Y. Kwon, S. Xi, M. Liu, K. Chen, W. Li, C. Fei, S.Y. Dai, Q. Chang, and J.S. Yuan. “Sustainable and Efficient Protein Production by Electro-biomanufacturing Enabled by Co-design of Catalysts and Bioprocesses.” Submitted to *One Earth*.

- [3] Racine, C.J., A. Badreldin, J. Pellessier, **Y. Chen**, S. Chen, S. Wang, J. Feng, C. Fei, Y.H. Hu, and Y. Li. “Large-Scale Synthesis (75 g/batch) of Single-Atom Catalysts for Selective Electrochemical CO<sub>2</sub> Reduction to CO and Commercialization Potential Analysis.” Submitted to *ACS Sustainable Chemistry & Engineering*.

## **WORK IN PROGRESS**

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- [1] Innovative Chebyshev Modeling of Temperature–Humidity Effects on Livestock Productivity (with Mengqiao Liu, Chengcheng Fei, Bruce McCarl, Xingguo Wang)
- [2] The Price of Forecast Error: Economic Implications of Hurricane Landfall Uncertainty for Gulf Coast Refineries (with Bruce McCarl, Yangyang Xu, Chengcheng Fei)
- [3] Environmental and Economic Assessment of Algae Cultivation to Produce Low-Carbon Aviation Fuels and Animal Meals (with Bin Long, Susie Dai, Joshua Yuan)
- [4] Forecasting National-Level Electricity Mix Based on Planned Installed Capacity: A Machine Learning and Multinomial Logit Modeling Approach (with Ning Lin, Robert Brooks)

## **GRANTS (AS PI OR CO-PI)**

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### **Awarded**

- [1] ”A Kinetic–Environmental–Economic Simulation Platform (KEEP) to Guide Biomanufacturing Experiments and Supply-Chain Decisions for CO<sub>2</sub>–Derived Products.” CURB Engineering Research Center (NSF) (Trainee Grants, PI, 2026-2027, \$15,000)
- [2] “Climate Change and Global Agriculture.” USDA–Foreign Agricultural Service (Co-PI, 2024–2027, \$2,500,000, 20% share).
- [3] “The Impact of English Proficient Reclassification on Long-Term Educational and Earnings Outcomes.” University of Houston ERC Project #055 (Co-PI, 2023–2027).

### **Unawarded**

- [1] “Impacts of Solar and Wind Expansion on U.S. Agricultural Production and Markets.” USDA-NIFA–AFRI (Co-PI, \$649,999, 22% share).
- [2] “Climate Impacts on Agricultural Production, Processing, and Transportation Facilities.” USDA-NIFA–AFRI (Co-PI, \$649,999, 18% share).
- [3] “DDRIGs: Simulating Sustainable Fuel Switching and Market Dynamics in Agriculture.” NSF-DDRIG (Student grant, PI, 2023, \$26,506).
- [4] “Economic and Environmental Assessment of Expanding Green Hydrogen in Agriculture.” USDA–SARE (Student grant, PI, 2023, \$16,500).

## TEACHING EXPERIENCE

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### University of Missouri

Invited Lecturer, Green Engineering (BIOL-EN/CH-ENG 4001/7001) Spring 2026

### Texas A&M University

Lab Instructor, AGEC 641 Applied Mathematical Programming (PhD level) Spring 2023

Teaching Assistant, AGEC 350 Natural Resource and Environmental Economics 2020–2021

Teaching Assistant, AGEC 621 Econometrics for Agribusiness (Master level) 2021

Teaching Assistant, AGEC 344 Agricultural and Food Law 2020–2021

### National Tsing Hua University

Teaching Assistant, Global Economy (EMBA) 2015

## MENTORSHIP

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Research mentor for 5 Ph.D. students in agricultural economics research.

Supervised undergraduate researcher, Duke University (CURB Summer Program).

## INVITED SEMINARS AND PRESENTATIONS

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Invited Seminar, Institute for Northwest Energy Futures, Washington State University 2025

Invited Seminar, Department of Agricultural Economics, University of Arkansas 2025

Invited Briefing, NSF Engineering Research Center (CURB) 2023, 2024, 2025

Invited Briefing, Defense Advanced Research Projects Agency (DARPA) 2025

Agricultural and Applied Economics Association (AAEA) Annual Meeting 2023, 2025, 2026

United States Association for Energy Economics (USAEE) Conference 2022, 2023, 2024

Texas A&M Conference on Energy 2022

GeoGulf Conference 2021

International Association for Energy Economics (IAEE) Conference 2021

Department of Economics Seminar, University of Texas at Austin 2019

## AWARDS AND HONORS

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US Association for Energy Economics, Young Professional Best Paper Award, Finalist 2024

Department Scholarship, Department of Agricultural Economics, TAMU 2024

Travel Scholarship (AAEA), Department of Agricultural Economics, TAMU 2022

GSA Travel Grant, Department of Agricultural Economics, TAMU 2021

Graduate Merit-based Tuition Scholarship, Department of Economics, UT Austin 2018-2019

Graduate Student Full Scholarship, NTHU, Taiwan 2013-2016

Lanzhou University Outstanding Undergraduate Honor 2013

Lanzhou University Outstanding Student Scholarship 2010-2012

Lanzhou University Outstanding Leadership Honor 2010-2011

## PROFESSIONAL SERVICE

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### Peer Reviewer

Climatic Change; Applied Economic Perspectives and Policy; Environmental Research Letters; Journal of Cleaner Production; Algal Research; Environmental Research: Ecology; Environmental Research: Climate; Environmental Research Communications

### **Conference and Academic Service**

Track Session Organizer, AAEA Annual Meeting, “The Economics of Livestock Systems: Environmental Shocks, Processing Constraints, and Consumer Behavior”	2026
Co-organizer, Neuroeconomics Workshop, National Tsing Hua University	2015–2016
Brown Bag Seminar Assistant, National Tsing Hua University	2014–2015

### **SKILLS**

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**Programming & Modeling:** R, Python, MATLAB, GAMS, Mathematica

**Econometrics & Data Analysis:** Stata, EViews, SQL, Excel (VBA)

**Visualization & Tools:** Git, Power BI, Microsoft Visio

**Optimization & Sustainability Tools:** BioSTEAM (TEA/LCA), openLCA

**Languages:** English (fluent), Mandarin and Wu (native), Spanish (B1)

### **AFFILIATION**

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United States Association for Energy Economics (USAEE), International Association for Energy Economics (IAEE), American Economic Association (AEA), Agricultural & Applied Economic Association (AAEA), Economic History Association (EH)