

CONNOR MULHOLLAND

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Research Fields

Primary: Environmental Economics; Agricultural and Applied Economics.

Secondary: Natural Resource Economics; Applied Microeconomics; Applied Econometrics.

Research Program

My research examines how environmental risk, market incentives, and climate change shape agricultural land use, farm structure, and rural welfare. I combine economic models of producer behavior under uncertainty with large administrative, transactional, and geospatial datasets. My current work studies price-risk-induced agricultural consolidation, the water-quality benefits of perennial agricultural systems, and changes in land stewardship preceding farm exit. My long-run agenda evaluates policies that can sustain productive and profitable agricultural systems while improving ecological outcomes and preserving the economic vitality of rural communities, with particular interest in the future of dairy production in Wisconsin and the United States.

Education

University of Oregon, Ph.D. in Economics

Expected June 2027

Dissertation: Agricultural Structural Change and Environmental Sustainability: Essays on Risk, Land Use, and Farm Transition

Committee: Edward Rubin (Chair), Laura Bakkensen, Glen Waddell, and Lucas Silva (Environmental Studies)

Fields: Environmental Economics, Agricultural and Applied Economics, and Econometrics

University of Wisconsin–Madison, B.A. in Economics

2020

Minor in Mathematics

Dissertation

Agricultural Structural Change and Environmental Sustainability: Essays on Risk, Land Use, and Farm Transition

The dissertation studies how economic and environmental risk influences agricultural restructuring and land-use decisions in the United States. The first essay develops a model of production under stochastic input and output prices and uses ethanol-plant expansion to estimate how price risk affects farm turnover and farmland markets. The second estimates the downstream water-quality effects of corn, soybean, pasture, and grassland acreage. The third examines whether producers alter crop rotations as they approach a land sale and whether drought and extreme heat accelerate both farm turnover and short-horizon land-use behavior.

Job Market Paper

Farmers Facing Risk: Evidence from Ethanol Plant Expansion in the Midwest

Job Market Paper / Solo-authored

A growing literature attributes declining farm numbers and increasing average farm size to the expansion of crop insurance. I hypothesize that these patterns may instead reflect underlying price risk and heterogeneous risk aversion. I develop a representative-farmer model in which producers face stochastic input and output prices. The model predicts that increased price risk disproportionately contracts the acreage and input use of more risk-averse operators, typically smaller farms, and can induce exit. I test these predictions using a county-level panel of agricultural land sales in Wisconsin and Illinois from 2013 to 2024 and plausibly exogenous variation in local corn-price exposure generated by ethanol-plant expansion. Greater nearby ethanol capacity increases farm-sale activity and reduces agricultural land values, with the strongest effects near ethanol plants. The results identify localized output-price risk as an important driver of agricultural restructuring and suggest that the relationship between crop insurance and consolidation may operate through risk-mediated channels rather than insurance provision alone.

Keywords: agricultural consolidation; price risk; ethanol; crop insurance; farmland markets; farm exit.

Working Papers

Agriculture's Nitrogen Solution

Working Paper / Solo-authored / 2025 University of Oregon Best Field Paper Award

Modern agricultural production is a major source of nitrogen pollution, yet comparatively little causal evidence identifies effective on-farm mitigation strategies. Using a geospatial watershed panel modeled on upstream-downstream hydrologic relationships, I estimate the effects of perennial grass, pasture, corn, and soybean acreage on downstream dissolved nitrogen concentrations. Perennial pasture substantially reduces downstream nitrogen, including in watersheds with persistent legacy nitrogen, while corn acreage increases nitrogen concentrations. The results identify an environmental advantage of perennial pasture relative to annual row-crop production and demonstrate that pasture-based livestock systems can improve water quality while remaining economically viable.

Research in Progress

Extractive Behavior Before Exit? Evidence from Farm Sales and Climate Risk in the Midwest

Third Dissertation Essay / Co-authored with Edward Rubin

Producers anticipating land transfer or market exit internalize fewer future returns from conservation investments and may therefore adopt more extractive short-run land-use practices. I link agricultural real estate transfers in Wisconsin and Illinois to annual USDA Cropland Data Layer classifications and high-resolution PRISM measures of drought and extreme heat. Parcel-level measures capture continuous corn, corn-soybean rotation, crop diversity, and perennial land cover surrounding a sale. Event-study and fixed-effects designs test whether rotations become less diverse before transfer, whether climate shocks increase farm-sale activity, and whether climate-induced sales exhibit more extractive pre-sale land use. The project provides evidence on dynamic stewardship incentives, climate-driven agricultural restructuring, and the environmental consequences of farm turnover.

Crop Insurance, Price Risk, and Agricultural Consolidation

Restricted-Data Project

Using USDA Agricultural Resource Management Survey Phase 2 and Phase 3 data, I disentangle the effects of underlying price risk from those of crop-insurance coverage on acreage, crop allocation, input use, and farm financial outcomes. The empirical analysis combines farm-level production and financial information with county-level weather, crop-price volatility, and ethanol-exposure measures. A complementary structural model characterizes acreage and input choices across insured and uninsured crops under stochastic prices, heterogeneous risk aversion, land suitability, and incomplete insurance. The project tests whether crop insurance primarily encourages expansion or instead enables more risk-sensitive operations to remain in production.

Producer Adoption and Cultural Evolution of Rotational Grazing Systems

Producer Survey Project / Extending UW-Madison Grassland 2.0 Research

Despite evidence of the economic, environmental, and animal-health benefits of managed intensive grazing, adoption among U.S. dairy producers remains limited. Existing explanations emphasize financial constraints, information frictions, and producer heterogeneity, but devote less attention to agricultural culture and social norms. Building on the “Stepping Stone” hypothesis developed through the UW-Madison Grassland 2.0 Initiative, I test whether adopting rotational grazing for dairy heifers increases the probability of subsequent whole-herd adoption of pasture-based dairy production. A survey of Midwestern dairy producers will link adoption pathways to producer characteristics, farm structure, management practices, information networks, and attitudes toward grazing. The project provides new evidence on how social norms, incremental learning, and transitional technologies shape the diffusion of sustainable agricultural systems.

Groundwater Regulation, Agricultural Adaptation, and Water Quality

Solo-authored / Difference-in-Differences Analysis

Groundwater depletion has generated an expanding patchwork of extraction regulations across the western United States, yet causal evidence outside of analysis of California's Sustainable Groundwater Management Act remains limited. I exploit three increasingly stringent policies implemented exclusively in Oregon's Harney Basin beginning in 2016. Using groundwater-monitoring data from the Oregon Water Resources Department, I estimate policy effects on groundwater levels with a staggered difference-in-differences design. I then examine producer adaptation through changes in crop choice and estimate the resulting effects on downstream nitrogen and phosphorus concentrations measured at U.S. Geological Survey monitoring stations. By linking regulation to resource conservation, agricultural adaptation, and water quality, the paper evaluates both the intended and broader environmental consequences of groundwater policy.

Future Research Agenda

My research program examines how environmental risk, public policy, and producer decision-making shape agricultural production, land use, and structural change. Combining economic theory, causal inference, geospatial data, remote sensing, and structural modeling, I study three related questions: (i) how risk and policy influence agricultural consolidation, farm transition, and land markets; (ii) how environmental regulations and resource constraints affect producer adaptation and environmental quality; and (iii) how sustainable production systems diffuse through agricultural communities through producer learning, technology adoption, and social norms. Across these areas, my objective is to produce policy-relevant research that strengthens the long-run economic viability of agricultural producers while improving environmental sustainability and rural welfare.

Research Experience

Ph.D. Student Researcher, Department of Economics, University of Oregon Sept. 2024–Present

Advisor: Edward Rubin

- Develop independent research in agricultural and environmental economics.
- Construct geospatial panels linking agricultural land transactions, ethanol-plant capacity, Census of Agriculture outcomes, PRISM weather, USDA Cropland Data Layer classifications, and USGS water-quality observations.
- Develop models of agricultural production under stochastic input and output prices, heterogeneous risk aversion, crop insurance, and land suitability.
- Apply high-dimensional fixed effects, Poisson pseudo-maximum likelihood, difference-in-differences, event-study methods, spatial analysis, raster processing, and structural modeling.

Research Intern, Department of Agricultural and Applied Economics, University of Wisconsin–Madison Jan. 2021–Jan. 2023

Advisor: Bradford Barham; Grassland 2.0 Initiative

- Co-developed the Heifer Grazing Compass and Beef Grazing Compass, farm-level decision-support tools comparing the financial and management implications of grazing-based livestock systems.
- Collaborated with UW–Madison Extension, USDA Natural Resources Conservation Service, agricultural lenders, producers, and specialists in agronomy, dairy science, animal science, and conservation.
- Conducted applied financial analysis using operation-specific farm data and translated results into producer-facing tools, training materials, and presentations.
- Trained more than 50 USDA NRCS and FSA personnel and other agricultural service providers in the use of the Compass tools.

Research Assistant, Department of Agricultural and Applied Economics, University of Wisconsin–Madison Feb. 2020–Dec. 2020

Advisor: Bradford Barham

- Supported research on household inequality and intrahousehold bargaining using survey data from India.
- Conducted data cleaning, econometric analysis, and literature reviews in R.
- Reviewed research on the environmental consequences of agricultural land use and the profitability of pasture-based production systems.

Teaching Experience

Instructor of Record, University of Oregon

ECON 333: Environmental and Natural Resource Economics

Winter 2025; Winter 2026

Designed and delivered the full undergraduate course, including lectures, assignments, quizzes, examinations, office hours, accommodations, grading, and Canvas administration. Topics included externalities, public goods, benefit-cost analysis, renewable and nonrenewable resources, pollution regulation, climate policy, and conservation.

ECON 434: Advanced Environmental Economics

Summer 2025; Fall 2026

Designed a calculus-based undergraduate course using optimization and applied economic models to analyze pollution control, resource extraction, renewable resources, climate change, and policy-instrument choice.

ECON 202: Introduction to Macroeconomics

Summer 2024

Served as sole instructor and designed lectures, assessments, examinations, and course administration covering national income accounting, economic growth, unemployment, inflation, monetary policy, and fiscal policy.

Graduate Teaching and Laboratory Instruction, University of Oregon

Core Macroeconomics Laboratory

Ph.D., 2023–2024;

Led weekly laboratories and office hours for first-year Ph.D. students and prepared students for course and preliminary examinations. *three terms*

Econometrics Laboratory

Ph.D. and

Undergraduate, Spring

2024; Spring 2025

Led problem-solving sessions and provided instruction in statistical inference, regression analysis, and empirical implementation.

Introduction to Macroeconomics Laboratory

Undergraduate,

2022–2023; three

terms

Prepared and led weekly laboratory sections for three approximately 50-student sections per term and held individual office hours.

Teaching Interests

Environmental Economics; Agricultural Economics; Natural Resource Economics; Applied Microeconomics; Econometrics; Principles of Microeconomics; Principles of Macroeconomics; Economics of Climate Change; Land and Water Economics.

Extension, Outreach, and Applied Tools

Grassland 2.0 and University of Wisconsin–Madison Extension

My Extension work focused on helping dairy and livestock producers evaluate transitions toward grazing-based production systems. Through the Grassland 2.0 Initiative, I worked across disciplinary and institutional boundaries to translate farm financial data and agronomic knowledge into practical decision-support tools. The resulting Heifer Grazing Compass and Beef Grazing Compass allow producers and advisers to compare confinement and grazing scenarios using operation-specific assumptions about feed, labor, land, infrastructure, animal performance, and management. This work required direct engagement with producers, Extension educators, conservation professionals, and agricultural service providers, as well as the communication of economic analysis to nontechnical audiences.

Selected Outreach and Training

- **USDA NRCS and FSA training.** Delivered live training to more than 50 agricultural service providers on using the Heifer Grazing Compass and Beef Grazing Compass in producer consultations.
- **World Dairy Expo.** Presented the Heifer Grazing Compass and financial results derived from operation-specific farm data to dairy producers and industry stakeholders.
- **GrassWorks Annual Grazing Conference.** Presented applied financial analysis and decision-support resources for grazing-based livestock production.
- **Public training resources.** Developed instructional materials supporting continued use of the Compass tools by producers, conservation professionals, and advisers.

Selected Presentations

<i>Farmers Facing Risk: Evidence from Ethanol Plant Expansion in the Midwest</i>	Nov. 21, 2026
Southern Economic Association Annual Conference	
<i>Agricultural Structural Change and Environmental Sustainability: Essays on Risk, Land Use, and Farm Transition</i>	May 29, 2026
Prospectus Defense, University of Oregon	
<i>Agriculture's Nitrogen Solution</i>	2025
Field Paper Presentation, University of Oregon	
<i>Heifer Grazing Compass</i>	Sept. 29, 2021
World Dairy Expo	
<i>Heifer Grazing Compass / Beef Grazing Compass</i>	Jan. 21, 2022
GrassWorks Annual Grazing Conference	
<i>Compass Training Workshop</i>	2021–2022
USDA NRCS/FSA and Partner Organizations	

Honors, Fellowships, and Awards

Kleinsorge Summer Fellowship, University of Oregon Department of Economics	2026
Best Field Paper Award, University of Oregon Department of Economics	2025
Dale Underwood Outstanding Graduate Student Scholarship, University of Oregon	2023
Dean's List, University of Wisconsin–Madison	2017

Professional Memberships

Agricultural and Applied Economics Association (AAEA)
Association of Environmental and Resource Economists (AERE)

Professional Development

AAEA Annual Meeting Employment Services	2026
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Technical Skills

Programming and statistical software: R; Stata; LaTeX; Python; Julia.

Selected R packages and workflows: `fixest`, `sf`, `terra`, `data.table`, `dplyr`, `tidyr`, `ggplot2`, `exactextractr`, `tigris`, parallel computing, and batch-processing workflows.

Econometric methods: Panel-data methods; high-dimensional fixed effects; Poisson pseudo-maximum likelihood; difference-in-differences; event studies; count-data models; clustered inference; structural modeling; comparative statics.

Geospatial methods: Coordinate reference systems; great-circle distance calculations; spatial joins; county and watershed overlays; raster extraction; satellite crop classification; upstream-downstream watershed networks; geocoding; large-scale spatial-panel construction.

Data sources: USDA ARMS; USDA NASS Quick Stats; Census of Agriculture; USDA Cropland Data Layer; PRISM climate data; USGS Water Quality Portal; HydroBASINS/HydroSHEDS; U.S. Energy Information Administration ethanol-capacity and petroleum-price data; state real estate transfer records.

Selected Data and Research Infrastructure

- **Midwestern agricultural land-transactions panel.** Cleaned and harmonized transaction-level agricultural real estate data for Wisconsin and Illinois from 2013–2024/25, including acreage, sale value, date, location, and agricultural-use classifications.
- **Ethanol-exposure measures.** Geocoded ethanol plants and constructed annual plant-capacity exposure measures within 0–50, 50–100, 100–150, 150–200, and 200–300 mile distance bands around farm sales and county centroids.
- **Agricultural land-use histories.** Developed scalable workflows for extracting crop shares and rotation histories around farm-sale locations from annual Cropland Data Layer rasters.
- **Watershed water-quality panel.** Linked USGS nitrogen observations, HydroBASINS flow relationships, upstream agricultural acreage, and PRISM weather at the watershed-year level.
- **Harney Basin groundwater panel.** Assembled groundwater-monitoring observations, hydrologic boundaries, and policy timing for evaluating groundwater-management interventions in southeastern Oregon.

Departmental and Professional Service

- Student mentoring through office hours, laboratory instruction, and individualized support for undergraduate and Ph.D. students.

Additional Employment

Graduate Employee, Department of Economics, University of Oregon	2022–Present
Research Intern, University of Wisconsin–Madison	2021–2023
Research Assistant, University of Wisconsin–Madison	2020

References

Edward Rubin

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