Awards issued prior to January 20, 2025, were funded under previous Administrations and may not reflect the priorities and policies of the current Administration.

United States Department of Agriculture
Project Initiation

Project Data for Accession Number 1032455

Project Title

A Comprehensive Econometric Toolkit for Modeling Heterogeneity in Climate Change Impacts on Agriculture

Project Details

Sponsoring Institution National Institute of Food and Agriculture	**Project Status** ACTIVE
Funding Source NIFA Non Formula	**Grant Year** 2024
Grant No. 2024-67023-42704	**Cumulative Award Amt.** $650,000.00
Proposal No. 2023-09536	**Multistate No.** (N/A)
Project Start Date Aug 01, 2024	**Project End Date** Jul 31, 2027
Program Code [A1651] Agriculture Economics and Rural Communities: Environment	

Project Director

Ghanem, D.

Recipient Organization

UNIVERSITY OF CALIFORNIA, DAVIS
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Performing Department

(N/A)

Non Technical Summary

This project supports the mission of the Agricultural Experiment Station by addressing the Hatch Act area(s) of: sustainable agriculture.Climate, pollution and other environmental factors pose great challenges to agriculture, food systems and their sustainability. Reliable quantification of the magnitude of those challenges and the uncertainty in this quantification is crucial to inform policy, private agents and the public. The increasing availability of high-frequency and high-resolution data has the potential to improve this quantification assuming reliable data-dependent methods are used for estimation and inference. The goal of this project is to develop a publicly accessible toolkit for climate impact assessments that incorporates state-of-the-art flexible, data-dependent estimation and inference methods to model heterogeneity in climate change impacts. We also plan to deploy our methodology to substantive empirical investigations of climate change impacts on agriculture, as well as to revisit prior studies employing our newly developed toolkit. From a more general perspective, given that other environmental questions in the context of

agriculture, tend to rely on similar data settings and often employ similar tools, the proposed methodological work has the potential to have broader implications for sustainable agriculture beyond weather and climate change impact assessments.

Animal Health Component

Animal Health Component: 0%

Research Effort Categories

Basic	40%
Applied	60%
Developmental	0%

Classification

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
605	0420	3010	30%
605	0430	3010	30%
605	7310	3010	40%

Knowledge Area

[605] Natural Resource and Environmental Economics

Subject Of Investigation

[0420] Weather

[0430] Decadal Weather Patterns

[7310] Experimental design and statistical methods

Field Of Science

[3010] Economics

Keywords

A Comprehensive Econometric Toolkit for Modeling Heterogeneity in Climate Change Impacts on Agricult

Goals / Objectives

This project seeks to provide a comprehensive toolkit to account for heterogeneity in climate change impact assessments. The specific goals of this project include:1. evaluate the bias of current methods in the climate change impacts literature2. propose robust, efficient and data-dependent estimators of the average response function3. provide tools for modeling observed and unobserved heterogeneity of damage functions4. support applied research and promote replicability by providing publicly accessible software for all proposed methods5. update estimates of climate damage functions for key agricultural outcomes, especially yield and acreage, to account for heterogeneity6.

provide clear and accessible guidance for practitioners in academia, policy agencies and beyond on how to implement the proposed methods and best practices for implementation7. promote interdisciplinary collaboration by training agricultural and resource economists with depth in econometrics and data science tools as well as statisticians with expertise in climate economics and agriculture

Project Methods

The proposed theoretical work will draw on several econometrics literatures, including robust parametric and semiparametric inference, panel data methods and mixed-frequency time-series. The proposed methods will be assessed in systematic simulation studies as well as empirical applications at the agriculture-climate nexus. To ensure that the theoretical developments remain synergistic with the demands and objectives of applied researchers, we plan to present the proposed work at all stages of the project.