Jeffrey D. Mullen

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Education:

Ph.D., Virginia Polytechnic Institute & State University, Department of Agricultural and Applied Economics, Blacksburg, VA, 1999.

B.S., Northwestern University, Department of Economics, Evanston, IL, 1988.

Academic Positions:

Director of Undergraduate Programs, Department of Agricultural and Applied Economics, The University of Georgia, Athens, GA, 2023 - present.

Director of Graduate Programs, Department of Agricultural and Applied Economics, The University of Georgia, Athens, GA, 2014 - 2023.

Associate Professor, Department of Agricultural and Applied Economics, The University of Georgia, Athens, GA, 2008 - present.

Assistant Professor, Department of Agricultural and Applied Economics, The University of Georgia, Athens, GA, July, 2000 – 2008.

Other Professional Positions:

Consultant, Battelle, Columbus, OH, 2009 to present.

Consultant, City of Mountain Park, GA, 2006 to present.

Water Resources Specialist, U.S. Army Corps of Engineers, Alexandria, VA, 1999-2000.

Consultant, United States Department of Agriculture, Bi-National Agricultural Research Development (BARD) Fund, Washington, DC, 1999.

Consultant, United States Army Corps of Engineers, Institute for Water Resources (IWR), Washington, DC, 1999.

Program Assistant, Institute for Transportation and Development Policy, Washington, DC, 1991-1992.

United States Peace Corps Volunteer, Tikobo I, Ghana, 1988 – 1990.

Peer-Reviewed Journal Articles (* indicates a student under my direction)

Mullen, Jeffrey D., and Mary Katherine Rubin*. 2024. "A Rapid Assessment Technique for Identifying Future Water Use and Pesticide Risks Due to Changing Cropping Patterns" *Sustainability* 16, no. 11: 4853. https://doi.org/10.3390/su16114853

Mullen, Jeffrey D., and Yizhou Niu*. 2023. "Cost-Effectiveness of Sustainable Agricultural Water Policies: Source Switching versus Irrigation Buyout Auctions in Georgia's Lower Flint River Basin" *Water* 15, no. 19: 3381. https://doi.org/10.3390/w15193381

*Huang,Yu-Kai, *Ranjit Bawa, **Jeffrey D. Mullen**, Nahal Hoghooghi, Latif Kalin, Puneet Dwivedi. (2022) "Designing Watersheds for Integrated Development (DWID): A stochastic dynamic optimization approach for understanding expected land use changes to meet potential water quality regulations," *Agricultural Water Management*, Volume 271, https://doi.org/10.1016/j.agwat.2022.107799.

Mullen, Jeffrey D. and Luren Dong*. (2022) "Effects of state and federal policy on renewable electricity generation capacity in the United States," *Energy Economics*, Volume 105, https://doi.org/10.1016/j.eneco.2021.105764.

Brown, Marilyn A., Puneet Dwivedi, Sudhagar Mani, Daniel Matisoff, Jacqueline E. Mohan, **Jeffrey Mullen**, Michael Oxman, Michael Rodgers, Richard Simmons, Blair Beasley, Lalith Polepeddi. (2021) "A framework for localizing global climate solutions and their carbon reduction potential," *Proceedings of the National Academy of Sciences* Aug 2021, 118 (31) e2100008118; DOI: 10.1073/pnas.2100008118

Brown, Marilyn A., Blair Beasley, Fikret Atalay, Kim M. Cobb, Puneet Dwivedi, Jeffrey Hubbs, David M. Iwaniec, Sudhagar Mani, Daniel Matisoff, Jacqueline E. Mohan, **Jeffrey Mullen**, Michael Oxman, Daniel Rochberg, Michael Rodgers, Marshall Shepherd, Richard Simmons, Laura Taylor, L. Beril Toktay. (2021) "Translating a Global Emission-Reduction Framework for Subnational Climate Action: A Case Study from the State of Georgia," *Environmental Management.* https://doi.org/10.1007/s00267-020-01406-1

Mullen, J.D. (2019). "Agricultural Water Policy During Drought: A Strategy for Including Groundwater Permits in Future Irrigation Buyout Auctions in the Flint River Basin," *Water*, 11, 151.

Lezzaik*, K., A. Milewski, and **J.D. Mullen** (2018). "The groundwater risk index: Development and application in the Middle East and North Africa region," *Science of the Total Environment*, Vol. 628–629:1149–1164.

Mullen, J.D., *K. Calhoun, and G. Colson (2017). "Preferences for Policy Attributes and Willingness to Pay for Water Quality Improvements Under Uncertainty," *Water Resources Research*, Vol. 53(4):2627-2642.

Atreya, A., W. Kriesel, and **J.D. Mullen** (2016). "Valuing Open Space in a Marshland Environment: Development Alternatives for Coastal Georgia." *Journal of Agricultural and Applied Economics*, 48 (4): 383-402. 2016.

Chen, T., M. Liu, Y. Takahashi, **J.D. Mullen**, and G.W.C. Ames (2015). "Carbon emission reduction and cost-benefit of methane digester systems on hog farms in China," *Journal of Environmental Planning and Management*, DOI: 10.1080/09640568.2015.1050484.

Ramirez, O.A., **J.D. Mullen**, and A.J. Collart (2014). "Insights into the Appropriate Level of Disaggregation for Efficient Time Series Model Forecasting." *Journal of Applied Statistics,* 41(10):2298-2311.

Mullen, J.D., M. Lamsal, and G. Colson, "Green Roof Adoption in Atlanta: The Effects of Building Characteristics and Subsidies on Net Private, Public, and Social Benefits." *Environmental Science and Technology*, 47:10824-10831(2013).

*Ngugi, D., K. Annan, **J.D. Mullen**, and J. Bergstrom, "Forecasting Land Use: An Application of Four Models," *International Journal of Arts and Sciences,* 6(1):637–649 (2013).

*Ngugi, D., **J.D. Mullen**, and J. Bergstrom, "Land Use Change and the Economic Value of Water Quality," *International Journal of Business and Management Studies,* 2(1):23–39 (2013)

*Cai, R., **J.D. Mullen**, M.E. Wetzstein, J.C. Bergstrom, "Using a Climate Index to Measure Crop Yield Response," *Journal of Agricultural and Applied Economics*, 45(4):719-737 (2013).

*Cai, R., **J.D. Mullen**, M.E. Wetzstein, J.C. Bergstrom, "The Impacts of Crop Yield and Price Volatility on Producers' Cropping Patterns: A Dynamic Optimal Crop Rotation Model," *Agricultural Systems*, 116, (March 2013): 52-59.

Mullen, J.D., U. Bekchanov, B. Karali, D. Kissel, M. Risse, and K. Rowles. "Assessing the Market for Poultry Litter in Georgia: Are Subsidies Needed to Protect Water Quality?" *Journal of Agricultural and Applied Economics*, 43(4), (November 2011): 553–568.

*Sande, D., **J.D. Mullen**, M.E. Wetzstein, and J.E. Houston, "Environmental Benefits from Reduced Pesticide Use: A Case Study of Soil Fumigant in Florida Tomato Production." *International Journal of Environmental Research and Public Health*, 8(12), (December 2011): 4649-4661.

Mullen, J.D., Y. Yu, G. Hoogenboom, "Estimating the demand for irrigation water in a humid climate: A case study from the southeastern United States," *Agricultural Water Management,* 96(10) (October 2009): 1421-1428.

Nickols, S.Y., **J.D. Mullen**, and L. Moshi "An Emerging Partnership for Addressing Chronic Conditions in the Ukerewe District, Tanzania" *Kappa Omicron Nu Forum on International Issues*, 18(1), (Spring 2009).

Centner, T.J., M.E. Wetzstein, and **J.D. Mullen**, "Small Livestock Producers with Diffuse Water Pollutants: Adopting a Disincentive for Unacceptable Manure Application Practices," *Desalination*, 226, (2008): 66-71.

Centner, T.J., C.L.P. Fowler, L.M.Risse, M.E. Wetzstein, and **J.D. Mullen**, "Implementing Environmental Management Systems to Protect Water Quality from Animal Waste Nutrients," *Environmental Research Journal* 1(2007): 333-344.

Mullen, J.D., J. Beckhusen, and K.C. Spurgeon, "A Hedonic Study of the Value of Irrigation Water in Georgia," *Southwestern Journal of Economics*, 8(2), (January 2006): 135-142.

*Gonzalez-Alvarez, Y., A.G. Keeler, **J.D. Mullen**, "Farm Level Irrigation and the Marginal Cost of Water Use: Evidence from Georgia," *Journal of Environmental Management*, Vol. 80(4), (September 2006): 311-317.

Mullen, J.D., C. Escalante, G. Hoogenboom, and Y. Yu, "Determinants of Irrigation Farmers' Crop Choice and Acreage Allocation Decisions: Opportunities for Extension Service Delivery," *Journal of Extension*, (October 2005).

Lawrence, T.M., **J.D. Mullen**, D.S. Noonan, and J. Enck, "Decision Factors Concerning Installation of Higher Efficiency Energy Consuming Equipment in Buildings," *ASHRAE Journal*, (September 2005): S40-S46.

Mullen, J.D. and T.J. Centner, "Impacts of Adjusting Environmental Regulations with Diffuse Enforcement Authority: Confined Animal Feeding Operations and Environmental Quality," *Review of Agricultural Economics*, 26 (2), (June 2004): 209-219.

Mullen, J.D., D.B. Taylor, M. Fofana, and D. Kebe, "A bio-economic model of long-run *Striga* control with an application to subsistence farming in Mali," *International Journal of Pest Management*, 49(3), July-September, 2003, pp. 251-264.

Mullen, J.D., D.B. Taylor, M. Fofana, and D. Kebe, "Integrating Long-Run Biological and Economic Considerations into *Striga* Management Programs," *Agricultural Systems*, May 2003, Vol. 76, Issue 2, pp. 787-795.

Mullen, J.D., G.W. Norton, and D.W. Reaves, "Economic Analysis of Environmental Benefits of Integrated Pest Management," *Journal of Agricultural and Applied Economics*, Vol. 29 (2), Dec. 1997, pp. 243-253.

Peer-Reviewed Proceedings (* indicates a student under my direction)

Mullen, J.D., "State-wide Water Planning: The Georgia Experience," *Journal of Agricultural and Applied Economics*, 43(3), (August 2011): 357–366.

*Lin, S., **J.D. Mullen**, and G. Hoogenboom, "Effects of Water Policy and Private Insurance Contracts on Supplemental Irrigation Management under Different Climate Scenarios," *Journal of Agricultural and Applied Economics,* 40 (2), (August 2008).

Centner, T.J., **J.D. Mullen**, and M.E. Wetzstein, "An Incentive for Adopting Best Management Practices for the Application of Manure to Land," *Proceedings of the 2007 Georgia Water Resources Conference*, Athens, GA, (March 2007): 451-454.

Center, T.J., M. Wetzstein, and **J.D. Mullen**, "Small livestock producers with diffuse water pollutants: Adopting a disincentive for unacceptable manure application practices," *Proceedings of the International Water Association Specialized Conference on Diffuse Pollution and Sustainable Basin Management*, Istanbul, Turkey, (September 2006).

*Spurgeon, Kyle C. and **J.D. Mullen**, "Estimating the Value of Irrigation Water in Georgia: A Hedonic Study," *Proceedings of the 2005 Georgia Water Resources Conference* Katheryn J.

Hatcher, editor, Institute of Ecology, The University of Georgia, Athens, Georgia, (April 2005), http://www.gwri.gatech.edu/conferences/previous-gwrc-conferences/gwrc-2005/.

*Beckhusen, Julia, Joseph B. Goodenbery, Gerrit Hoogenboom, and **J.D. Mullen**, "Effects of Hurricanes Frances, Ivan and Jeanne on Georgia Irrigators," *Proceedings of the 2005 Georgia Water Resources Conference* Katheryn J. Hatcher, editor, Institute of Ecology, The University of Georgia, Athens, Georgia, (April 2005), http://www.gwri.gatech.edu/conferences/previous-gwrc-conferences/gwrc-2005/.

*Yu, Yingzhuo, **J.D. Mullen**, and Gerrit Hoogenboom, "Irrigation Management Strategies in Georgia," *Proceedings of the 2005 Georgia Water Resources Conference* Katheryn J. Hatcher, editor, Institute of Ecology, The University of Georgia, Athens, Georgia, (April 2005), http://www.gwri.gatech.edu/conferences/previous-gwrc-conferences/gwrc-2005/.

Centner, Terence J., and **J.D. Mullen**, "Regulatory Responses to Potential Pollutants from Animal Feeding Operations: Opting Out of Costly Permitting Regulations," *Journal of Agricultural and Applied Economics*, 36 (2), (August 2004): 287-295.

Centner, Terence J. and **J.D. Mullen**, "Regulating the Disposal of Animal Manure to Safeguard Water Supplies," *Proceedings of the International Conference on Water Security for Future Generations*, Changchun, China, (July 2004): 43-44.

Published Book Reviews

Mullen, Jeffrey D., "Book Review: Economics and Ecological Risk Assessment: Applications to Watershed Management," *American Journal of Agricultural Economics*, 89 (1), (February 2007): 222-223.

Mullen, Jeffrey D., "Book Review: Multiple Criteria Analysis for Agricultural Decisions," *Agricultural Systems*, 82(1), (October 2004): 96-97.

Mullen, Jeffrey D., "Book Review: Pricing Irrigation Water: Principles and Cases from Developing Countries," *Journal of Agribusiness*, 22 (2), (Fall 2004).

Other Professional Publications

Hook, J., G. Hoogenboom, J., Paz, J.D. Mullen, J.B. Bergstrom, M. Risse, "Agricultural Irrigation Water Demand for Georgia's Major And Minor Crops 2011 Through 2050," available at http://www.nespal.org/sirp/waterinfo/State/awd/agwaterdemand.htm

Centner, T.J., C.L.P. Fowler, L.M. Risse, M.E. Wetzstein and J.D. Mullen, "Implementing Environmental Management Systems to Protect Water Quality from Animal Waste Nutrients," in New Trends in Environmental Research (Nova Science Publishers, Inc., 2009), chapter 9.

Kriesel, Warren, and Jeffrey D. Mullen, *Hedonic Price Analysis of Brownfield Redevelopment: Phase One Paulsen Street Substation, Savannah, Georgia*, Report submitted to Georgia Environmental Protection Division, (February 2006): 14 pages.

Lawrence, Thomas M., Jeffrey D. Mullen, Douglas S. Noonan, and Jay Enck, "Moving Beyond the First Cost Mentality," *Solar Today*, (Nov./Dec., 2005): 34-37.

Phillips, Willard S., John C. Bergstrom, Jeffrey H. Dorfman, and Jeffrey D. Mullen, *Analysis of Pilot Study Data for the Georgia Department of Natural Resources Coastal Resources Division in Relation to the Georgia Blue Crab Fishery*, (August 2004): 45 pages.

Course Responsibilities

Graduate Courses Taught

AAEC 6210, Production Economics: Theory with Applications

A mathematically rigorous course in neoclassical production economics. Properties of production functions and issues related to their estimation are covered, along with constrained optimization techniques. Dynamic considerations and production under uncertainty are also addressed.

AAEC 6610, Quantitative Techniques in Agricultural Economics

A Master's level course in applied econometrics with an emphasis on understanding the derivation of parameter estimates and their statistical properties. Topics in multiple regression analysis, systems of equations, limited dependent variables, and hypothesis testing are covered. Using scalar and matrix algebra, problem sets involve writing, problem solving, and model estimation with SAS.

AAEC 6610L, Quantitative Techniques in Agricultural Economics Lab

A computer lab for applied econometrics that accompanies AAEC 6610. Topics in multiple regression analysis, systems of equations, and hypothesis testing are covered. Students are introduced to computer programming using SAS IML and Base SAS. Emphasis is placed on data management, data manipulation, model estimation, demonstration of fundamental statistical concepts, and the implication of violations of the Classical Linear Regression Model on the statistical properties of parameter estimates.

AAEC 6630 and 6630E, Quantitative Tools for Business Decisions

A course in quantitative tools for business decisions focused on the following topics: Statistical Tests, Regression, Linear Programming, Non-Linear Programming, Integer Programming, Forecasting, and Risk Modeling. These tools are introduced in lecture and then put to practical use in the computer lab using SAS and Excel.

ENVM 6800, Water Resource Economics

This course addresses fundamental issues related to water and the economic concepts and tools relevant to its allocation and use. Graduate students study complex models of urban water use, forecasting methods, industrial and agricultural water demand, and economic approaches to water quality issues. Water rights, international trade agreements, and water pricing are also covered in depth. Innovative teaching techniques include a series of interactive games illustrating the meaning of the Coase theorem and the power and limitations of market solutions, the efficiency properties of various auction institutions, and the design of nutrient trading programs. Students also complete labs related to Incremental Cost Analysis (ICA), Cost Effectiveness Analysis (CEA) and Multi-Criteria Decision Making (MCDM). A series of homework assignments emphasize writing and data collection, analysis and presentation, culminating in a term paper. Graduate students from other departments including Forestry, Ecology, and Environmental Design consistently enroll in this course.

ENVM 8750, Natural Resource and Environmental Economics

A Ph.D. course focused on the economics of renewable and non-renewable resources and the environment. Major topics include non-market valuation techniques, dynamic optimization, tradable pollution credits, fisheries, forests, and water.

Undergraduate Courses Taught

AAEC 2060, Economic Perspectives on the Environment and Natural Resources

An exploration of the relationships between a healthy environment and a healthy economy. Students gain conceptual insight, problem-solving skills, and general knowledge needed to better understand and solve environmental and natural resource issues and problems from an economic perspective that recognizes important linkages between economic, environmental, and ethical systems. Weekly homework assignments focus on current events at the local, state, national and international levels. Term projects entail group research and presentations of position papers in an interactive debate forum.

ENVM 3060, Principles of Resource Economics

Forests, farmland, fisheries, water, energy security and more. Students learn key concepts and policies related to renewable and depletable natural resources. The core of the class is inter-temporal analysis. Written and problem solving assignments reinforce readings and lectures, with a focus on current events and the long-run implications of today's policy decisions. The identification of stakeholder groups is stressed and the rhetorical aspects of their positions are discussed. A term paper and oral presentation are required. Weekly homework assignments focus on current events at the local, state, national and international levels.

AAEC 4210, Production Economics: Theory with Applications

A mathematical, graphical and verbal examination of production economics through market equilibrium, this course provides students a thorough understanding of the neoclassical microeconomic theory of production under static certainty. Students develop skills for applying economic theory to various managerial and policy problems and gain an understanding of the implications of bringing time and uncertainty into economic decision making.

ENVM 4800, Water Resource Economics

In the context of water undergraduate students learn demand forecasting, how to incorporate uncertainty into economic analyses, the effects of externalities on social welfare, and alternative property rights regimes. Water quality and quantity issues are addressed. International trade agreements and water pricing are also covered in depth. Students participate in market games demonstrating the social costs of externalities and when markets can and cannot overcome them. A series of homework assignments emphasize writing and data collection, analysis and presentation, culminating in a comparative analysis of water supply, water demand, and water institutions across three states. Undergraduate students from other departments including Economics, Forestry, Ecology, and Environmental Design consistently enroll in this course.

ENVM 4150, Energy Economics

This is an introductory course in energy economics. Topics include time preferences, renewable and non-renewable resource extraction models, externalities, impediments to alternative energy adoption, life-cycle analysis, greenhouse gas emissions, electricity markets, and more. The course includes a research project focused on energy, economics and sustainability. Students from all disciplines are welcome.