

Elena G. Irwin
Short Curriculum Vitae

Overall Research Impact: Google scholar cites: 8900+, 24 papers with >100 cites, h-index: 34, external research funding as PI or Co-PI > \$19 million, 5 post-docs mentored, 18 Ph.D. students advised

Department of Agricultural, Environmental, and Development Economics, The Ohio State University
2120 Fyffe Road, Columbus, OH 43210, email: irwin.78@osu.edu

Professional Experience

- 2020-present Distinguished Professor of Food, Agricultural and Environmental Sciences in Economics and Sustainability, Ohio State University
- 2019-present Faculty Director, Sustainability Institute, Ohio State University.
- 2015-2018 Faculty Director, Sustainable and Resilient Economy Discovery Themes Initiative, Ohio State University
- 2010-present Professor, Department of Agricultural, Environmental & Development Economics, Ohio State University
- 2007-2008 Visiting Professor, Professorship for Environmental Economics and Policy, ETH Zürich and Social and Industrial Ecology, Dept. of Geography, University of Zürich
- 2005-2010 Associate Professor, Department of Agricultural, Environmental & Development Economics, Ohio State University
- 1998-2005 Assistant Professor, Department of Agricultural, Environmental & Development Economics, Ohio State University

Education

- University of Maryland, College Park, MD. 1998. Ph.D., Agricultural and Resource Economics.
- Washington University, St. Louis, MO. AB, 1988. Major fields: German and History.

Areas of Interest

Land use change, management and policy; ecosystem services; integrated land-water systems models; applied spatial analysis and econometrics; urbanization; housing & land markets; sustainability assessment; Great Lakes communities and resilience; community-engaged research and broadening participation

Research Leadership Activities

Faculty Director, Sustainability Institute at Ohio State. Direct interdisciplinary research and academic activities for large, university institute aimed at catalyzing sustainability research, teaching, engagement and campus stewardship at Ohio State; foster collaborations among faculty in sustainability science across natural, physical and social sciences, engineering, public health, planning, policy and the humanities; partner with academic units to mentor 31 jointly hired SI core faculty from across 18 units; develop extramural funding opportunities and external partnerships; lead sustainability education and learning committee to promote interdisciplinary curriculum development and coordination. Website: <https://si.osu.edu/>

PI, Great Lakes Food-Energy-Water Systems Research Project. Lead an interdisciplinary team to develop integrated modeling of food, energy and water systems in the Great Lakes, including coupled models of farmer land use and management decisions and nutrient transport in the Maumee watershed of Lake Erie to assess the benefits of nutrient reduction to Lake Erie ecosystem services and costs to farmers. Funding: NSF Innovations at the Nexus of Food, Energy, Water Systems, USDA NIFA Resilient Agriculture Under a Changing Climate, NSF

Coupled Natural-Human Systems Program, Ohio Sea Grant. Website: <https://drfews.osu.edu>

Co-PI, EmPOWERment Convergent Graduate Training Program for a Sustainable Energy Future.

Work collaboratively with faculty from engineering, physical and environmental sciences, social sciences, and policy to develop and lead an interdisciplinary research graduate program that provides training and support to cohorts of PhD students engaged in basic and applied research on energy technologies, adoption, systems analysis, and policy. Funding: NSF National Research Traineeship (NRT) Program. Website: <https://energyfuture.osu.edu/>

Distinctions and Awards

Distinguished Professor of Food, Agricultural and Environmental Sciences in Economics and Sustainability. Selected as one of four inaugural honorees within the College of Food, Agricultural, and Environmental Sciences, Ohio State University, 2020-current.

Food Systems Leadership Institute (FSLI) Fellow, Cohort 14, 2018-2020

Member, Agricultural and Applied Economics Association Executive Board, 2019-2022. Provide guidance and strategic direction to an international membership organization of 2,500 agricultural and applied economists working in academia, public and private sectors.

Member, US EPA Board of Scientific Councilors (BOSC) Sustainable and Healthy Communities Subcommittee, Sept 2014-Aug 2016, Feb 2018-current. Serve as member of this federal advisory committee that provides advice and recommendations to the EPA's Office of Research and Development and assessment of research conducted by EPA scientists on community sustainability topics including public health and well-being; sustainability indicators and systems-based assessment methods; decision science and support tools; sustainable approaches for contaminated sites and materials management. Website: <https://www.epa.gov/bosc/sustainable-and-healthy-communities-subcommittee>

Member, Board of Directors, Association of Environmental and Resource Economists, 2015-2018. Provide guidance and strategic direction to an international membership organization of over 1,000 environmental and resource economists working in over 30 countries from academia, public and private sectors.

Member, National Science Foundation Advisory Committee for Environmental Research and Education Subcommittee on Sustainable Urban Systems, 2017-2018. Coauthored a report that articulates a compelling research agenda that will transform understanding of sustainable urban systems, including a clear statement of the need for long-term research, a synthesis of the current work, and short and long-term research priorities. <https://www.nsf.gov/ere/ereweb/acre/sustainable-urban-systems.pdf>

Member, National Research Council Land Change Modeling Committee, 2011-2012. Coauthored report that provides a summary and evaluation of land change modeling approaches, and their theoretical and empirical underpinnings, suggests guidance for their appropriate application, and makes recommendations to further advance the science, data, and cyberinfrastructure of land change modeling. <https://www.nap.edu/catalog/18385/advancing-land-change-modeling-opportunities-and-research-requirements>

Multi-Disciplinary Team Award, College of Food, Agricultural and Environmental Sciences, Ohio State University, 2019

North American Colleges and Teachers of Agriculture (NACTA) Educator Award, 2015

Sustainability Science Award, Ecological Society of America, 2009

Distinguished Research Award, Top Junior Faculty, Ohio Agricultural Research and Development Center, Ohio State University, 2009

Geoffrey J.D. Hewings Award for Distinguished Young Scholar in Regional Science, North American Regional Science Council, 2008

Best Paper, 1st Runner-Up, North American Association for Computational Social and Organizational Science Conference, 2004

Article of the Year Award, Northeast Agricultural and Resource Economics Association, 2003

MacArthur Foundation Research Fellowship, 1994-1997

Teaching

AED Economics 7415: Urban and Spatial Economics (PhD)

AED Economics 4330: The Sustainable Economy: Concepts and Methods (Undergraduate)

AED Economics 4567: Assessing Sustainability: Project Experience (Undergraduate capstone)

AED Economics 6020: Public Policy and Market Regulation (Masters)

Research

Selected Peer Reviewed Journal Publications

Chen, Y, EG Irwin, C Jayaprakash, KJ Park. 2021. An agent based model of a thinly traded land market in an urbanizing region. *Journal of Artificial Societies and Social Simulation* 24(1): 1-7.

Lee, J, N Irwin, EG Irwin, HJ Miller. 2020. The role of distance-dependent vs. localized amenities in polarizing urban spatial structure: A spatio-temporal analysis of residential location value in Columbus, Ohio, 2000-2015. *Geographical Analysis*. <https://doi.org/10.1111/gean.12238>

Liu, H, W Zhang, EG Irwin, N Aloysius, J Martin. 2020. A spatially integrated economic-ecological model of farmers' land management decisions and water quality outcomes in Lake Erie. *Land Economics* 96(4).

Pickett, S, M Cadenasso, M Baker, L Band, C Boone, G Buckley, P Groffman, M Grove, E Irwin, S Kaushal, S LaDeau, A Miller, C Nilon, M Romolini, E Rosi, C Swan, K Szlavetz. 2020. Theoretical Perspectives of the Baltimore Ecosystem Study: Conceptual Evolution in a Social-Ecological Research Project. 2020. *BioScience*. 70(4): 297–314.

Cardoso, L, M Bittencourt, W Litt, EG Irwin. 2019. Biofuels policies and fuel demand elasticities in Brazil. *Energy Policy* 128, 296-305

Irwin, EG, PJ Culligan, M Fischer-Kowalski, K Lavender Law, R Murtugudde, S Pfirman. 2018. Bridging barriers to advance global sustainability. *Nature Sustainability*. 1(7): 324-326.

Irwin, N, EG Irwin, J Martin, P Aracena. 2018. Constructed wetlands for water quality improvements: Benefit transfer analysis from Ohio. *Journal of Environmental Management*. 206:1063-1071.

Chen, Y, EG. Irwin, C Jayaprakash, N Irwin. 2017. Market thinness, income sorting and leapfrog development across the urban-rural gradient. *Regional Science and Urban Econ*. 66: 213-223.

Irwin, N, KA Klaiber, EG Irwin. 2017. Do stormwater basins generate co-benefits? Evidence from Baltimore County, Maryland. *Ecological Economics* 141:202-212.

Zhang, W, DH Wrenn, EG Irwin. 2017. Spatial heterogeneity, accessibility, and zoning: An empirical investigation of leapfrog development. *Journal of Economic Geography*. 17(3): 547–570.

Irwin, EG, S Gopalakrishnan, A Randall. 2016. Welfare, wealth and sustainability. *Annual Review of Resource Economics* 8: doi: 10.1146/annurev-resource-100815-095351.

Irwin, EG, J Campbell, R Wilson, A Faggian, R Moore, N Irwin. 2016. Human adaptations in food, energy and

water systems. *Journal of Environmental Studies and Science*. DOI: 10.1007/s13412-016-0375-8.

Wrenn, Douglas and Elena G. Irwin. 2015. Time Is Money: An empirical examination of the effects of regulatory delay on residential subdivision development. *Regional Science and Urban Economics* 51: 25-36.

Irwin, EG, PW Jeanty, MD Partridge. 2014. Amenity values versus land constraints: The local effects and spatial spillovers of preserved land and natural features on housing values. *Land Economics* 90(1): 61-78.

Chen, Yong, Elena G. Irwin, Ciriya Jayaprakash. 2013. Population dispersion vs. concentration in a two-region migration model with endogenous natural amenities. *Journal of Regional Science*. 53(2): 256–273.

Chen, Yong, Ciriya Jayaprakash, Elena G. Irwin. 2012. Threshold management in a coupled economic–ecological system. *Journal of Environmental Economics and Management* 64(3): 442-455.

Brady, Michael and Elena G. Irwin. 2011. Accounting for spatial effects in economic models of land use: Recent developments and challenges ahead. *Environmental and Resource Economics*. 48(3): 487-509.

Irwin, Elena G. 2010. New directions for urban economic models of land use change: incorporating spatial dynamics and heterogeneity. *Journal of Regional Science* 50(1): 65-91.

Irwin, Elena G., Kathleen P. Bell, Nancy E. Bockstael, David Newburn, Mark D. Partridge, Junjie Wu. 2009. The economics of urban-rural space. *Annual Review of Resource Economics*, 1: 435-459.

Chen, Yong, Elena G. Irwin and Ciriya Jayaprakash. 2009. Dynamic modeling of environmental amenity-driven migration with ecological feedbacks. *Ecological Economics* 68: 2498-2510.

Irwin, EG, NE Bockstael. 2007. Evolution of urban sprawl: Evidence of spatial heterogeneity and increasing land fragmentation. *Proceedings of the National Academy of Sciences* (PNAS). Dec 26, 2007; 104 (52): 20672-20677.

Carrion-Flores, Carmen and Elena G. Irwin. 2004. Determinants of residential land use conversion and sprawl at the rural-urban fringe. *American Journal of Agricultural Economics*, 86(4): 889-904.

Irwin, Elena G. 2002. The effects of open space on residential property values. *Land Econ.*, 78(4): 465-481.

Irwin, Elena G. and Nancy E. Bockstael. 2002. Interacting agents, spatial externalities, and the endogenous evolution of residential land use pattern. *Journal of Economic Geography*, 2(1), January: 31-54.

Edited Books and Reports

Pickett, STA, ML Cadenasso, JM Grove, EG Irwin, EJ Rosi, C Swan, eds. 2019. *Science for the Sustainable City: Empirical Insights from the Baltimore School of Urban Ecology*. New Haven & London: Yale University Press.

Advisory Committee for Environmental Research and Education. 2018. *Sustainable Urban Systems: Articulating a Long-Term Convergence Research Agenda*. A Report from the NSF Advisory Committee for Environmental Research and Education. Prepared by the Sustainable Urban Systems Subcommittee.

<https://www.nsf.gov/ere/ereweb/ac-ere/sustainable-urban-systems.pdf>. Members: A Ramaswami (chair), L Bettencourt, A Clarens, S Das, G Fitzgerald, EG Irwin, D Pataki, S Pincetl, K Seto, P Waddell.

National Research Council. 2014. *Advancing Land Change Modeling: Opportunities and Research Requirements*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/18385>. Committee: D Brown (chair), L Band, K Green, EG Irwin, A Jain, E Lambin, R Pontius, K Seto, BL Turner, P Verberg

Manuscripts

Ahn, J, EG Irwin. Spatial variations in housing market bust and recovery: Are urban areas more resilient?

Gore, C, A Carrel, EG Irwin. What drives battery electric vehicle adoption? The impact of regional differences in carbon dioxide emissions on consumer decisions.

Irwin, N, EG Irwin. Rebuilding this city: How do housing markets respond to city-led redevelopment?

Jaeger, W., E. Fenichel, EG Irwin, A Herziger, S Levin. Meeting the challenges of interdisciplinary research on human-natural systems.

SELECTED RESEARCH FUNDING

NRT-HDR: Convergent Graduate Training and EmPOWERment for a Sustainable Energy Future. PI: R Sioshansi. Co-PIs: A Agarwal, J Bielicki, EG Irwin, M Mayhew, R Ramnath. \$3,000,000. 9/2019-8/2024.

INFEWS/T1: Impacts of Deglobalization on the Sustainability and Resilience of Regional Food, Energy, Water Systems. NSF Innovations at the Nexus of Food Energy Water Systems. PI: Irwin. Co-PIs: Jeff Bielicki, Yongyang Cai, Jay Martin, Robyn Wilson. \$2,431,141. 9/15/2017 – 9/14/2020.

Building a sustainable and resilient agroecosystem through an understanding of climate and farmer behavioral variability. USDA NIFA. PI: Robyn Wilson; CoPIs: Irwin, Yongyang Cai, Kai Zhou, Aaron Wilson. \$1,199,396. 08/01/2018-8/21/2021.

Co-Evolution of Upstream Human Behavior and Downstream Ecosystem Services in a Changing Climate. NSF Coupled Human and Natural Systems program. PIs: Jay Martin, Carlo DeMarchi, Elena G Irwin, Stuart Ludsin, Eric Toman, Robyn Wilson. \$1.5 million. 9/2011 – 8/2015.

Spatial dynamic modeling of exurban land markets and land use patterns. NSF Geography and Spatial Sciences program. PIs: Elena Irwin, Yong Chen, Ciriya Jayaprakash. \$230,000. 9/2011 – 8/2014.

Linkages and Feedbacks Between Regional Climate Variability and Patterns of Urban Development – Impacts on the Urban Water Cycle and Nutrient Export. NSF Water Sustainability and Climate Program. PI: Claire Welty. Co-PIs include Irwin. \$5.0 million. 1/2011 – 12/ 2015.

Development of empirical analyses and simulation models of urban household and firm location behaviors and landscape outcomes. Coop. Agreement, U.S. Forest Service USDA Northern Research Station and Baltimore Ecological Study (BES) LTER program. PI: Elena G. Irwin. \$150,000. 10/2010 – 9/2016.

Multiscale dynamics & emergent patterns in urban spatial systems. James S. McDonnell Foundation, Study of Complex Systems, 2008-2012. PI's: E.G. Irwin and C. Jayaprakash. \$406,834. 9/2008 – 8/2013.

Leveraging natural amenities for sustainable development in Great Lakes region. NOAA/Ohio Sea Grant, 2010-2012. PIs: Mark Partridge, Elena G. Irwin and Heather Stephens. \$177,313. 2/2010 – 12/ 2012.

Large lake ecosystems: Modeling the interactions among human, biological and physical processes. NSF Coupled Human Natural Systems. PI: D. Culver. Co-PI's: EG Irwin, A. Randall. \$1.4 million. 2004-2008.

THESIS ADVISOR AND POSTDOCTORAL MENTOR: Yong Chen, PhD (2009); Isaac Bayoh, PhD (2010); Doug Wrenn, PhD (2012), postdoc (2012-13); Heather Stephens, PhD (2012); Matthew Gnagey, PhD (2013); Avishek Konar, PhD (2014); Wendong Zhang, PhD (2015); Laporchia Collins, PhD (2016); Nic Irwin, PhD (2016), postdoc (2017-18); Aneil Baron, PhD (2016); Jae-Wan Ahn, PhD (2019); Tim Jaquet, PhD (2019), postdoc (current); Seung-hun Chung, PhD (2019); Brian Cultice, PhD (current); Christina Gore, PhD (current); Mackenzie Jones (current). **Total since 2001:** 3 Postdoc; 16 PhD, 6 MS.