
Syllabus

ENVIRONMENTAL AND URBAN ECONOMICS

2nd Quarter 2021

Contact

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Location and times

Tue, Thu, 9-11am. Office hours: Mon, 3pm-4pm over zoom

Course objectives and learning goals

This class is a graduate-level course that aims to provide insight into the fields of Environmental and Urban economics. The goal of this course is four-fold. The first goal of this class is to familiarize students with the classic literature and research questions in both fields, and to explore the current research frontier. The second goal is to practice scientific reading comprehension, presentation, and discussion skills. The third goal is to develop an independent research idea, and craft a proposal. The fourth goal is to familiarize students with reproducible and portable work flows in R and Rstudio, to enable students to generate reproducible research.

Grading

Your final course grade will be based on your presentation of a research paper (pick from reading list), your discussion of a research paper (pick from reading list), your completion of a practice exercise in R, and your research proposal.

Participation and absence

Participation in class is highly encouraged. However, there will be no participation credit. I will not take attendance, however, excessive absence may result in grade reduction.

Course outline (tentative)

Tu, 13.04.	Environmental: Climate change and other damages
Th, 15.04.	Environmental: Climate change and other damages + Github version control
Tu, 20.04.	Environmental: VSL
Th, 22.04.	Environmental: Pollution and health + .Rprofile, tidyverse, here
Tu, 27.04.	Environmental: Pollution and health
Th, 29.04.	Environmental: Emissions regulation + Rmarkdown, notebooks, xaringan
Tu, 04.05.	Energy
Th, 06.05.	Demand estimation + webscraping, API
Tu, 11.05.	Discrete choice estimation
Th, 13.05.	Revealed preferences: WTP
Tu, 18.05.	Numerical optimization
Th, 20.05.	Urban: Cities, Rosen-Roback
Tu, 25.05.	Urban: Cities, Rosen-Roback
Th, 27.05.	Urban: Residential sorting + R: estimate discrete choice model
Tu, 01.06.	Urban: Residential sorting
Th, 03.06.	<i>Holiday</i>
Tu, 08.06.	Urban: Modern sorting applications
Th, 10.06.	Urban: Importing gravity equations
Tu, 15.06.	Environmental justice
Th, 17.06.	Environmental justice
Tu, 22.06.	Present research proposals
Th, 24.06.	Present research proposals

Literature

These are selected papers to familiarize students with each topic or method. This list of papers is not exhaustive. Naturally many sections overlap, and many papers fit into more than one section.

Papers marked with ★ are eligible for student presentations and discussions. Algorithm for presentation & discussion: Form a team (≥ 2) with any classmate(s) of your choice. Agree on a number of papers equal to the number of students in your team. Each student presents at least one paper, and discusses at least one paper. The paper that a student presents has to be different from the paper the student discusses.

Climate change and damages

- Nordhaus (1991). Too Slow or Not Too Slow: The Economics of the Greenhouse Effect. *Economic Journal*
- Nordhaus (1993). Optimal Greenhouse-Gas Reductions and Tax Policy in the “DICE” Model. *American Economic Review*
- Nordhaus (1993). Rolling the “DICE”: An Optimal Transition Path for Controlling Greenhouse Gases. *Resource and Energy Economics*
- Deschenes, Greenstone (2007). The Economic Impacts of Climate Change: Evidence from Agricultural Output and Random Fluctuations in Weather. *American Economic Review*
- Schlenker, Roberts (2009). Nonlinear Temperature Effects Indicate Severe Damages to U.S. Crop Yields Under Climate Change. *PNAS*
- Hsiang, Kopp (2018). Climate Change: A Guide for Economists. *Journal of Economic Perspectives*
- Barrage (2019). The Nobel Memorial Prize for William D. Nordhaus. *Scandinavian Journal of Economics*
- Burke, Emerick (2016). Adaptation to Climate Change: Evidence from US Agriculture. *American Economic Journal*
- Auffhammer (2018). Climate Adaptive Response Estimation: Short and Long Run Impacts of Climate Change on Residential Electricity and Natural Gas Consumption Using Big Data. NBER Working Paper 24397
- ★ Cruz Alvarez, Rossi-Hansberg (2021). The Economic Geography of Global Warming. NBER Working Paper 28466
- ★ Stern, Stiglitz (2021). The Social Cost of Carbon, Risk, Distribution, Market Failures: An Alternative Approach. NBER Working Paper 28472
- ★ Burke, Driscoll, Xue, Heft-Neal, Burney, Wara (2021) The Changing Risk and Burden of Wildfire in the US. NBER Working Paper 27423

VSL

- Viscusi, Aldy (2003). The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World. *Journal of Risk and Uncertainty*
- Davis (2004). The Effect of Health Risk on Housing Values: Evidence from a Cancer Cluster. *American Economic Review*.
- Hall, Jones (2007). The Value of Life and the Rise in Health Spending. *Quarterly Journal of Economics*
- Aldy, Viscusi (2008). Adjusting the Value of a Statistical Life for Age and Cohort Effects. *Review of Economics and Statistics*
- U.S. Environmental Protection Agency (2011). Benefits and Costs of the Clean Air Act from 1990 to 2020.
- Kniesner, Viscusi, Woock, Ziliak (2012). The Value of a Statistical Life: Evidence from Panel Data. *Review of Economics and Statistics*
- Banzhaf (2014). The Cold War Origins of the Value of a Statistical Life, *Journal of Economic Perspectives*
- Lee, Taylor (2019). Randomized Safety Inspections and Risk Exposure on the Job: Quasi-Experimental Estimates of the Value of a Statistical Life. *American Economic Journal: Economic Policy*
- Evans, Taylor (2020). Using Revealed Preference Methods to Estimate the Value of Reduced Mortality Risk: Best Practice Recommendations for the Hedonic Wage Model. *Review of Environmental Economics and Policy*
- ★ Ketcham, Kuminoff, Saha (2020). Valuing Statistical Life using Seniors Medical Spending. Working Paper

Pollution and health

- Chay, Greenstone (2003). The Impact of Air Pollution on Infant Mortality: Evidence from Geographic Variation in Pollution Shocks Induced by a Recession. *Quarterly Journal of Economics*
- Currie, Neidell (2005). Air Pollution and Infant Health: What Can We Learn from California's Recent Experience? *Quarterly Journal of Economics*
- Currie, Schmieder, Neidell (2009). Air Pollution and Infant Health: Lessons from New Jersey
- Currie, Walker (2011). Traffic Congestion and Infant Health: Evidence from E-ZPass. *American Economic Journal: Applied Economics*

- Graff-Zivin, Neidell (2012). The Impact of Pollution on Worker Productivity. *American Economic Review*
- Currie, Davis, Greenstone, Walker (2015). Do Housing Prices Reflect Environmental Health Risks? Evidence from More than 1,600 Toxic Plant Openings and Closings. *American Economic Review*
- Schlenker, Walker (2016). Airports, Air Pollution, and Contemporaneous Health. *Review of Economic Studies*
- Barreca, Clay, Deschenes, Greenstone, Shapiro (2016). Adapting to Climate Change: The Remarkable Decline in the U.S. Temperature-Mortality Relationship over the Twentieth Century. *Journal of Political Economy*
- Isen, Rossin-Slater, Walker (2017). Every Breath You Take, Every Dollar You'll Make: The Long-Term Consequences of the Clean Air Act of 1970. *Journal of Political Economy*
- Aizer, Currie, Simon, Vivier (2018). Do Low Levels of Blood Lead Reduce Children's Future Text Scores? *American Economic Journal: Applied Economics*
- Bishop, Ketcham, Kuminoff (2018). Hazed and Confused: The Effect of Air Pollution on Dementia. NBER Working Paper 24970
- Deryugina, Heutel, Miller, Molitor, Reif (2019). The Mortality and Medical Costs of Air Pollution: Evidence from Changes in Wind Direction. *American Economic Review*
- ★ Dave, Yang (2021). Lead in Drinking Water and Birth Outcomes: A Tale of Two Water Treatment Plants. NBER Working Paper 27996

Emissions regulation

- Fowlie (2009). Incomplete Environmental Regulation, Imperfect Competition, and Emissions Leakage. *American Economic Journal: Economic Policy*
- Fowlie (2010). Emissions Trading, Electricity Restructuring, and Investment in Pollution Abatement. *American Economic Review*
- Holland (2012). Emissions Taxes Versus Intensity Standards: Second-Best Environmental Policies With Incomplete Regulation. *Journal of Environmental Economics and Management*
- Greenstone, Jack (2015). *Envirodevonomics: A Research Agenda for an Emerging Field*. *Journal of Economic Literature*
- Jacobsen, Benthem (2015). Vehicle Scrappage and Gasoline Policy. *American Economic Review*
- Fowlie, Reguant, Ryan (2016). Market-Based Emissions Regulation and Industry Dynamics. *Journal of Political Economy*

- Keiser, Shapiro (2019). Consequences of the Clean Water Act and the Demand for Water Quality. *Quarterly Journal of Economics*
- ★ Aldy, Kotchen, Evans, Fowlie, Levinson, Palmer (2021). Co-Benefits and Regulatory Impact Analysis: Theory and Evidence from Federal Air Quality Regulations. NBER Working Paper 27603
- ★ Deryugina, Miller, Molitor, Reif (2021). Geographic and Socioeconomic Heterogeneity in the Benefits of Reducing Air Pollution in the United States. NBER Working Paper 27357

Energy

- Borenstein (2012). The Private and Public Economics of Renewable Electricity Generation. *Journal of Economic Perspectives*
- Ito (2014). Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing. *American Economic Review*
- Davis, Wolfram (2012). Deregulation, Consolidation, and Efficiency: Evidence from US Nuclear Power. *American Economic Journal: Applied Economics*
- Borenstein, Bushnell (2015). The U.S. Electricity Industry After 20 Years of Restructuring. *Annual Review of Economics*
- Auffhammer, Baylis, Hausman (2017). Climate Change Climate Change is Projected to Have Severe Impacts on the Frequency and Intensity of Peak Electricity Demand across the United States. *Proceedings of the National Academies of Sciences*
- Jack, Smith (2020). Charging Ahead: Prepaid Metering, Electricity Use, and Utility Revenue. *American Economic Journal: Applied Economics*
- ★ Burlig, Bushnell, Rapson, Wolfram (2021). Low Energy: Estimating Electric Vehicle Electricity Use. NBER Working Paper 28451
- ★ Hahn, Metcalfe (2021). Efficiency and Equity Impacts of Energy Subsidies. NBER Working Paper 28371

Demand estimation

- Li, Timmins, von Haefen (2009). How Do Gasoline Prices Affect Fleet Fuel Economy. *American Economic Journal: Economic Policy*
- Bento, Hughes, Kaffine (2013). Carpooling and Driver Responses to Fuel Price Changes: Evidence from Traffic Flows in Los Angeles. *Journal of Urban Economics*
- Busse, Knittel, Zettelmeyer (2013). Are Consumers Myopic? Evidence from New and Used Car Purchases. *American Economic Review*

- Ito (2014). Do Consumers Respond to Marginal or Average Price? Evidence from Non-Linear Electricity Pricing. *American Economic Review*
- Sallee, West, Fan (2016). Do Consumers Recognize the Value of Fuel Economy? Evidence from Used Car Prices and Gasoline Price Fluctuations. *Journal of Public Economics*
- ★ Levinsohn, Sager (2021). Who Values Future Energy Savings? Evidence from American Drivers. NBER Working Paper 28219
- ★ Davis (2021). Estimating the Price Elasticity of Demand for Subways: Evidence from Mexico. NBER Working Paper 28244
- ★ Ito, Ida, Tanaka (2021). Selection on Welfare Gains: Experimental Evidence from Electricity Plan Choice. NBER Working Paper 28413

Discrete choice estimation. Introduction

- McFadden (1974). The Measurement of Urban Travel Demand. *Journal of Public Economics*
- Berry (1994). Estimating Discrete-Choice Models of Product Differentiation. *RAND Journal of Economics*
- Berry, Levinsohn, Pakes (1995). Automobile Prices in Market Equilibrium. *Econometrica*
- Nevo (2000). A Practitioner's Guide to Estimation of Random Coefficients Logit Models of Demand. *Journal of Economics and Management Strategy*
- Manski (2001). Daniel McFadden and the Econometric Analysis of Discrete Choice. *Scandinavian Journal of Economics*
- Textbook: Cameron, Trivedi. *Microeconometrics: Methods and Application*
- Textbook: Train, *Discrete Choice Methods with Simulation*
- Kennan, Walker (2011). The Effect of Expected Income on Individual Migration Decisions. *Econometrica*
- Matejka, McKay (2015). Rational Inattention to Discrete Choices: A New Foundation for the Multinomial Logit Model. *American Economic Review*

Revealed preferences: WTP for environmental quality

- Rosen (1974). Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy*
- Sieg, Smith, Banzhaf, Walsh (2004). Estimating the General Equilibrium Benefits of Large Changes in Spatially Delineated Public Goods. *International Economic Review*
- Bajari, Benkard (2005). Demand Estimation With Heterogeneous Consumers and Unobserved Product Characteristics: A Hedonic Approach. *Journal of Political Economy*
- Chay and Greenstone (2005). Does Air Quality Matter? Evidence from the Housing Market. *Journal of Political Economy*
- Kuminoff (2009). Decomposing the Structural Identification of Nonmarket Values. *Journal of Environmental Economics and Management*
- Bishop, Timmins (2016). Using Panel Data to Easily Estimate Hedonic Demand Functions. *Journal of the Association of Environmental and Resource Economists*
- Deschenes, Greenstone, Shapiro (2017). Defensive Investments and the Demand for Air Quality: Evidence from the NOx Budget Program. *American Economic Review*
- Ito, Zhang (2020). Willingness to Pay for Clean Air: Evidence from Air Purifier Markets in China. *Journal of Political Economy*
- ★ Greenstone, He, Jia, Liu (2021). Can Technology Solve the Principal-Agent Problem? Evidence from China's War on Air Pollution. NBER Working Paper
- ★ Keys, Mulder (2021). Neglected No More: Housing Markets, Mortgage Lending, and Sea Level Rise. NBER Working Paper 27930

Cities, Rosen-Roback

- Roback (1982). Wages, Rents, and the Quality of Life. *Journal of Political Economy*
- Blomquist, Berger, Hoehn (1988). New Estimates of Quality of Life in Urban Areas. *American Economic Review*
- Glaeser (1998). Are Cities Dying? *Journal of Economic Perspectives*
- Graves, Waldman (1991). Multimarket Amenity Compensation and the Behavior of the Elderly. *American Economic Review*
- Costa, Kahn (2000). Power Couples: Changes in the Locational Choice of the College Educated, 1940-1990. *Quarterly Journal of Economics*
- Shapiro (2006). Smart Cities: Quality of Life, Productivity, and the Growth Effects of Human Capital. *Review of Economics and Statistics*

- Gyourko, Mayer, Sinai (2013). Superstar Cities. *American Economic Journal: Economic Policy*
- Albouy, Graf, Kellogg, Wolff (2016). Climate Amenities, Climate Change, and American Quality of Life. *Journal of the Association of Environmental and Resource Economists*
- Glaeser, Gyourko (2018). The Economic Implications of Housing Supply. *Journal of Economic Perspectives*
- ★ Miyauchi, Nakajima, Redding (2021). Consumption Access and Agglomeration: Evidence from Smartphone Data. NBER Working Paper 28497
- ★ Kreindler, Miyauchi (2021). Measuring Commuting and Economic Activity inside Cities with Cell Phone Records. NBER Working Paper 28516
- ★ Graff Zivin, Liao, Panassie (2021). How Hurricanes Sweep Up Housing Markets: Evidence from Florida. NBER Working Paper 27542
- ★ Holland, Mansur, Muller, Yates (2021). The Environmental Benefits from Transportation Electrification: Urban Buses. NBER Working Paper 27285

Residential sorting

- Tiebout (1956). A Pure Theory of Local Expenditures. *Journal of Political Economy*
- Epple, Filimon, Romer (1993). *Regional Sciences and Urban Economics*
- Epple, Platt (1998). Equilibrium and Local Redistribution in an Urban Economy When Households Differ in Both Preferences and Income. *Journal of Urban Economics*
- Epple, Sieg (1999). Estimating Equilibrium Models of Local Jurisdictions. *Journal of Political Economy*
- Smith, Sieg, Banzhaf, Walsh (2004). General Equilibrium Benefits for Environmental Improvements: Projected Ozone Reductions under EPA's Prospective Analysis for the Los Angeles Air Basin. *Journal of Environmental Economics and Management*
- Bayer, Ferreira, McMillan (2007). A Unified Framework for Measuring Preference for Schools and Neighborhoods. *Journal of Political Economy*
- Banzhaf, Walsh (2008). Do People Vote With Their Feet? An Empirical Test of Tiebout's Hypothesis. *American Economic Review*
- Bayer, Keohane, Timmins (2009). Migration and Hedonic Valuation: The Case of Air Quality. *Journal of Environmental Economics and Management*
- Kuminoff, Smith, Timmins (2013). The New Economics of Equilibrium Sorting and Policy Evaluation Using Housing Markets. *Journal of Economic Literature*
- Bayer, MacMillan, Murphy, Timmins (2016). A Dynamic Model of Demand for Houses and Neighborhoods. *Econometrica*

- Diamond (2016). The Determinants and Welfare Implications of U.S. Workers' Diverging Location Choices by Skill: 1980-2000. *American Economic Review*
- Sinha, Caulkins, Cropper (2018). Household Location Decisions and the Value of Climate Amenities. *Journal of Environmental Economics and Management*
- ★ Pellegrina, Sotelo (2021). Migration, Specialization, and Trade: Evidence from Brazil's March to the West. NBER Working Paper 28421
- ★ Bernstein, Billings, Gustafson, Lewis (2021). Voting with their Sandals: Partisan Residential Sorting on Climate Change Risk. NBER Working Paper 27989
- ★ Ferreira, Wong (2021) Estimating Preferences for Neighborhood Amenities Under Imperfect Information. NBER Working Paper 28165
- ★ Liang, Song, Timmins (2021). Frictional Sorting. NBER Working Paper 27643

Environmental justice

- Brooks, Sethi (1997). The Distribution of Pollution: Community Characteristics and Exposure to Air Toxics. *Journal of Environmental Economics and Management*
- Cameron, McConnaha (2006). Evidence of Environmental Migration. *Land Economics*
- Black, Devereux, Salvanes (2007). From the Cradle to the Labor Market? The Effect of Birth Weight on Adult Outcomes. *Quarterly Journal of Economics*
- Currie (2011). Inequality at Birth: Some Causes and Consequences. *American Economic Review*
- Bento, Freedman, Lang (2015). Who Benefits From Environmental Regulation? Evidence from the Clean Air Act. *Review of Economics and Statistics*
- Depro, O'Neil, Timmins (2015). White Flight and Coming to the Nuisance: Can Residential Mobility Explain Environmental Injustice? *Journal of the Association of Environmental and Resource Economists*
- Banzhaf, Ma, Timmins (2019). Environmental Justice: The Economics of Race, Place, and Pollution. *Journal of Economic Perspectives*
- Hsiang, Oliva, Walker (2019). The Distribution of Environmental Damages. *Review of Environmental Economics and Policy*
- ★ Hernandez-Cortes, Meng (2020). Do Environmental Markets Cause Environmental Injustice? Evidence from California's Carbon Market. NBER Working Paper 27205
- ★ Shapiro, Walker (2021). Where is Pollution Moving? Environmental Markets and Environmental Justice. NBER Working Paper 28389