

## **Economics 267: The Economics of Pollution (Winter 2021)**

### **Instructor:**

Joshua Graff Zivin

GPS Building, Room 1313

E-mail: [jgraffzivin@ucsd.edu](mailto:jgraffzivin@ucsd.edu)

Office Hours: TBD and by appointment

### **Meeting Times and Location:**

Thursdays, 11:00am – 1:50pm

### **Course Description:**

This course will provide examine the economics of pollution and its impacts on health, human capital, and economic development. Our emphasis will largely be empirical, with a focus on the key estimation challenges that characterize this literature. Upon completing this course students should have a broad understanding of the aforementioned relationships as well as the skills to critically analyze and produce original research in the field. The course should appeal to students in the environmental, public, labor, and development fields.

### **Reading List**

The course reading list includes required and supplementary materials. Required readings for each week are indicated by a \*\* and a careful reading of them before each class session is required. The course will run on a seminar-style format such that everyone is expected to actively participate in class discussions. I'm happy to direct students to additional papers on particular topics of interest that may not be included in the reading list.

### **Assignments and Grades**

Grades will be based on three assignments, with weights indicated in parentheses.

1. Discussion leader: each student will serve as class discussion leader for at least one required course reading assigned by the instructor (25%).
2. Mock referee report (due February 4th by email): a concise two-page referee report of a recent working paper within the course content area. The report should include a brief summary of the methods and findings followed by a longer section (i.e. more than a page) critiquing the paper. Your critique can include potential problems with the method or assumptions that may be violated, suggestions for improvements in the presentation, and plausible extensions and refinements to the main arguments (25%)
3. Research proposal and presentation (papers due March 3rd). The proposal should resemble a paper prospectus or grant proposal and describe a research project that contributes to the broad literatures covered in class. The written proposal and literature review (5-8 pages of concise text, excluding references, tables, etc.) is accompanied by a presentation during the last week of classes. (50%)

## **Schedule and Reading List:**

### **Week 1: Course Overview & Economics of Environmental Regulation**

- Key Topics: Market Failure, Coase, and Pigouvian Taxes; Cap-and-Trade
- Readings:
  - \*\*Cropper, Maureen and Wallace Oates, "Environmental Economics: A Survey," *Journal of Economic Literature* 30(2), 1992.
  - Lichtenberg, E and D Zilberman. "Efficient Regulation of Environmental Health Risks." *Quarterly Journal of Economics* 103(1988): 167-178.

### **Week 2: Pollution and Health**

- Key Topics: Mortality, Morbidity, and Latency
- Readings:
  - \*\*Graff Zivin, J and M Neidell. "Environment, Health, and Human Capital." *Journal of Economic Literature* 51(2013): 689-730.
  - \*\*Chay, K and M Greenstone. "The Impact of Air Pollution on Infant Mortality: Evidence from Geographic Variation in Pollution Shocks Induced by a Recession." *Quarterly Journal of Economics* 118(2003) 1121-1167.
  - \*\*Schlenker, W., & Walker, W. R. "Airports, Air Pollution, and Contemporaneous Health." *The Review of Economic Studies*, 83(2016): 768-809.
  - \*\*Bishop, Kelly C., Jonathan D. Ketcham, and Nicolai V. Kuminoff. "Hazed and confused: the effect of air pollution on dementia." NBER WP #24970 (2018).
  - Almond, D and J Currie. "Killing Me Softly: The Fetal Origins Hypothesis." *Journal of Economics Perspectives* 25(2011): 153-172.
  - Grossman, M "On the Concept of Health Capital and the Demand for Health." *Journal of Political Economy*, 80(1972): 223-55.
  - Currie, J and R Walker. "Traffic Congestion and Infant Health: Evidence from E-ZPass." *American Economic Journal: Applied Economics* 3(2011): 65-90.
  - Lleras-Muney, A. "The Needs of the Army: Using Compulsory Relocation in the Military to Estimate the Effect of Air Pollutants on Children's Health." *Journal of Human Resources* 45(2010): 549-90.
  - Deschenes, O, M Greenstone, and J Shapiro. "Defensive Investments and the Demand for Air Quality: Evidence from the NOx Budget Program." *American Economic Review* 107(2017): 2958-2989.

### **Week 3: Pollution and Human Capital**

- Key Topics: Schooling, Cognitive Performance, Labor Market Outcomes
- Readings:
  - \*\*Graff Zivin, J and M Neidell. "The Impact of Pollution on Worker Productivity." *American Economic Review* 102(2012): 3652-3673.
  - \*\*Ebenstein, Avraham, Victor Lavy, and Sefi Roth. "The Long-Run Economic Consequences of High-Stakes Examinations: Evidence from Transitory Variation in Pollution." *American Economic Journal: Applied Economics* 8(2016): 36-65.

- \*\*Bharadwaj et al. "Gray Matters: Fetal Pollution Exposure and Human Capital Formation." *Journal of the Association of Environmental and Resource Economists*, 4(2016): 505-542.
- \*\*Isen, A., Rossin-Slater, M., & Walker, W. R. "Every Breath You Take—Every Dollar You'll Make: The Long-Term Consequences of the Clean Air Act of 1970." *Journal of Political Economy*, 125(2017): 848-902.
- Currie et al. "Does Pollution Increase School Absences?" *Review of Economics and Statistics* (91)2009: 682-94.
- Hanna, R and P Oliva. "The Effect of Pollution on Labor Supply: Evidence from a Natural Experiment in Mexico City." *Journal of Public Economics* 122(2015): 68-79.
- Chang, T., Zivin, J. G., Gross, T., & Neidell, M. "The Effect of Pollution on Worker Productivity: Evidence from Call-Center Workers in China." *American Economic Journal: Applied Economics* (11)2019: 151-172.

#### **Week 4: Endogenous Exposure to Pollution**

- Key Topics: Sorting and Avoidance Behavior
- Readings:
  - \*\*Banzhaf, Spencer, Lala Ma, and Christopher Timmins. "Environmental Justice: The Economics of Race, Place, and Pollution." *Journal of Economic Perspectives* 33 (2019): 185-208.
  - \*\*Currie, Janet. "Inequality at Birth: Some Causes and Consequences." *American Economic Review* 101(2011): 1-22.
  - \*\*Neidell, M. "Information, Avoidance Behavior, and Health: The Effect of Ozone on Asthma Hospitalizations." *Journal of Human Resources* 44(2009): 450-478.
  - \*\*Graff Zivin, J, M Neidell, and W Schlenker, "Water Quality Violations and Avoidance Behavior: Evidence from Bottled Water Consumption." *American Economic Review* 101(2011): 448-453.
  - Banzhaf, S and R Walsh. "Do People Vote with Their Feet? An Empirical Test of Tiebout." *American Economic Review* 98(2008): 843-63.
  - Graff Zivin, J and M Neidell. "Days of Haze: Environmental Information Disclosure and Intertemporal Avoidance Behavior." *Journal of Environmental Economics and Management* 58(2009): 119-128.
  - Moretti, E and M Neidell. "Pollution, Health, and Avoidance Behavior: Evidence from the Ports of Los Angeles." *Journal of Human Resources* 46(2011): 154-75.
  - Kuminoff, N, K Smith, and C Timmins. "The New Economics of Equilibrium Sorting and Policy Evaluation Using Housing Markets." *Journal of Economic Literature* 51(2013): 1007-1062.

## **Week 5: The Costs of Regulation**

- Key Topics: Competitiveness, Labor, Pollution Havens
- Readings:
  - \*\* Shapiro, J. and R. Walker. "Why is Pollution from US Manufacturing Declining? The Roles of Environmental Regulation, Productivity, and Trade." *American Economic Review* 108(2018): 3814-3854.
  - \*\*Levinson, A. "Technology, International Trade, and Pollution from US Manufacturing." *American Economic Review* (99)2009: 2177-2192.
  - \*\*Walker, R. "The Transitional Costs of Sectoral Reallocation: Evidence From the Clean Air Act and the Workforce." *Quarterly Journal of Economics* 128(2013): 1787-1835.
  - Greenstone, M, J List, and C Syverson. *The Effects of Environmental Regulation on the Competitiveness of US Manufacturing*. NBER Working Paper # 18392.
  - Hanna, R. "US Environmental Regulation and FDI: Evidence from a Panel of US-Based Multinational Firms." *American Economic Journal: Applied Economics* 2(2010): 158-189.
  - Walker, R. "Environmental Regulation and Labor Reallocation: Evidence from the Clean Air Act." *The American Economic Review* 101(2011): 442-447.
  - Becker, R and V Henderson. "Effects of Air Quality Regulations on Polluting Industries." *Journal of Political Economy* 108(2000): 379-421.

## **Week 6: Benefits Valuation**

- Key Topics: VSL, Hedonics, Stated-Preference, Happiness
- Readings:
  - \*\* Smith, K, and J Huang. "Can Markets Value Air Quality? A Meta-Analysis of Hedonic Property Value Models." *Journal of Political Economy* 103(1995): 209-227.
  - \*\* Currie et al. "Environmental Health Risks and Housing Values: Evidence from 1,600 Toxic Plant Openings and Closings." *The American Economic Review* 105(2015): 678-709.
  - \*\*Levinson, A. "Valuing Public Goods Using Happiness Data: The Case of Air Quality." *Journal of Public Economics* 96(2012): 869-880.
  - Viscusi, K and J Aldy. "The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World." *Journal of Risk and Uncertainty* 27(2003): 5-76.
  - Chay, K and M Greenstone. "Does Air Quality Matter? Evidence from the Housing Market." *Journal of Political Economy* 113(2005): 376-424
  - Konar, S, and M. Cohen. "Does the Market Value Environmental Performance?" *Review of Economics and Statistics* 83(2001): 281-289.
  - Gamper-Rabindran, S and C Timmins "Hazardous Waste Cleanup, Neighborhood Gentrification, and Environmental Justice: Evidence from Restricted Access Census Block Data." *American Economic Review Proceedings* 101(2011): 620-624.

## **Week 7: Pollution and Development**

- Key Topics: Poverty Interactions, Missing Markets
- Readings:
  - \*\*Greenstone, M and K Jack. "Envirodevonomics: A Research Agenda for an Emerging Field." *Journal of Economic Literature* 53(2015): 5-42.
  - \*\*Alix-Garcia et al. "The Ecological Footprint of Poverty Alleviation: Evidence from Mexico's Oportunidades Program." *Review of Economics and Statistics* 95(2013): 417-435.
  - \*\*Arceo, E, R Hanna, and P Oliva. "Does the Effect of Pollution on Infant Mortality Differ Between Developing and Developed Countries? Evidence from Mexico City." *The Economic Journal* (2015): 257-280.
  - Garg, T., Jagnani, M., & Taraz, V. "Temperature and Human Capital in India." *Journal of the Association of Environmental and Resource Economists* 7(2020): 1113-1150.

## **Week 8: Impacts of Climate Change**

- Key Topics: Weather vs Climate, Adaptation
- Readings:
  - \*\*Dell, M, B Jones, and B Olken. "What Do We Learn from the Weather? The New Climate-Economy Literature." *Journal of Economic Literature* 52(2014): 740-798.
  - \*\*Barreca, Alan, et al. "Adapting to Climate Change: The Remarkable Decline in the US Temperature-Mortality Relationship Over the Twentieth Century." *Journal of Political Economy* 124(2016): 105-159.
  - \*\*Graff Zivin, J and M Neidell. "Temperature and the Allocation of Time: Implications for Climate Change." *Journal of Labor Economics* 32(2014): 1-26.
  - \*\*Graff Zivin, J, S Hsiang, and M Neidell. "Temperature and Human Capital in the Short-and Long-Run." *Journal of the Association of Environmental and Resource Economists* 5(2018): 77-105.
  - Burke, M, S Hsiang, and E Miguel. "Global Non-Linear Effect of Temperature on Economic Production." *Nature* 527(2015): 235-239.
  - Deschenes, O and E Moretti. "Extreme Weather Events, Mortality, and Migration." *The Review of Economics and Statistics* 91(2009): 659-681.
  - Deschenes, O and M Greenstone (2007). "Climate Change, Mortality, and Adaptation: Evidence from Annual Fluctuations in Weather in the U.S." *American Economic Journal: Applied Economics* 3(2011): 152-85.
  - Graff Zivin, J, Y Song, Q Tang, and P Zhang, "Temperature and High-Stakes Cognitive Performance: Evidence from the National College Entrance Examination in China," *Journal of Environmental Economics and Management*, 104 (2020): 102365.

## **Weeks 9 and 10: Student Research Proposal Presentations**