

AEB 7483, Seminar in Environmental Economics, Spring 2024

Lecture:

Tuesday 3:00-4:55 pm; McCarty Hall A 2186

Thursday 4:05-4:55pm; McCarty Hall A 3194

Instructor: Dr. Xinde "James" Ji

Email: xji1@ufl.edu

Office Hours: Wednesday 2:30 - 4:30 pm or by appointment.

Location: Physically at my office (MCCA 1181) and virtually with Zoom <https://ufl.zoom.us/j/98767930214>

Teaching Mode

This class will be taught fully in person unless otherwise notified.

Course Description

Externalities, design of environmental policy, cost-benefit analysis, and non-market valuation. Economic theories applicable to address environmental problems as well as quantitative tools to derive intuition, test hypothesis, and measure changes because of environmental policy.

which means:

This PhD-level course covers theoretical and empirical components of modern environmental economics. The first half of the class offers theoretical insights and empirical tests of those insights. Topics include optimal environmental policy, cost-effective environmental policy, and instrument choice. Second half of the class focuses on empirical applications of economic tools to environmental problems. Topics could range from the following depending on students' interest: non-market valuation; climate change; air pollution; water pollution; water scarcity; environment and development; cost-benefit analysis; and environmental justice.

Student Learning

After successful completion of the course, you should be able to:

1. Appreciate the breadth and depth of modern environmental economics theory and empirical applications.
2. Articulate key insights from the existing literature and identify gaps for future research
3. Apply theoretical and empirical insights to formulate original research questions in environmental economics or an adjacent field
4. Present and critique research ideas with a scholarly standard

Prerequisites

This course is an advanced PhD level field course. Students are expected to have finished PhD microeconomics and econometrics sequence courses (AEB7108, AEB 7571, or equivalent). Please reach out to me if you have questions about your preparation for this course.

Textbook

Required

A Course in Environmental Economics: Theory, Policy, and Practice, by Daniel J. Phaneuf and Till Requate, Cambridge University Press (2017)

Optional

A Primer on Non-market Valuation (2nd Edition), by Patricia A. Champ, Kevin J. Boyle, and Thomas C. Brown, Springer (2017)

Pricing the Priceless: the History of Environmental Economics, by Spencer Banzhaf, Cambridge University Press (2023)

Readings

Readings associated with each topic are listed below.

Grading

You will be evaluated with a total of 100 points, which consist of the following:

1. Class Participation (10%)
2. Paper Presentation (30%)
3. Referee Report and Presentation (20% = 12% written report + 8% presentation)
4. Research Proposal (10%)
5. Research Paper (30% = 20% written paper + 10% presentation)

Points will be translated into grades according to the following table. For information on current UF policies for assigning grade points, see [here](#)

Grade	Points	Grade Points
A	>93	4.00
A-	90-92.9	3.67
B+	86-89.9	3.33
B	83-85.9	3.00
B-	80-82.9	2.67
C+	76-79.9	2.33
C	73-75.9	2.00
C-	70-72.9	1.67
D+	66-69.9	1.33
D	>63-65.9	1.00
D-	60-62.9	0.67
E	<60	0.00

Class participation

You are expected read the assigned readings before each module and actively participate in classroom discourses. Additionally, you are required to ask at least one constructive question during each paper/referee report/research project presentation session.

Paper presentation

You will be leading discussions on a series of the papers listed in the course outline. You should prepare a 20-minute presentation as if you are the author of the paper.

Referee report and presentation

You are asked by the *Journal of Environmental Economics and Management* to review a manuscript. Your task is to write a referee report and present your report to the editor (aka, the instructor and the rest of the class), assessing the suitability of the paper to be published in *JEEM*.

You should referee a working paper that has not been published yet, which could range from first draft to third-round R&R. Additionally, you should choose a paper that falls into at least one of the following categories (which also serves as a list for you to select papers to review). A paper that does not fall into any of the following categories will need explicit approval from the instructor. If you have trouble selecting a paper, I am happy to pick one for you.

- A paper that was presented at one of the NBER-hosted conferences (e.g., Summer Institute, Program Meetings, or thematic meetings)
- A *job market paper* by a current or recent (within the past 2 years) job market candidate
- A paper that has been presented at one of the following conferences: AERE@ASSA; Camp Resources; Heartland Environmental and Resource Economics Workshop; the Occasional Workshop in Environmental and Resource Economics; the Online Summer Workshop in Environment, Energy, and Transportation(OSWEET); the Social Cost of Water Workshop; or the Southeastern Workshop on Energy & Environmental Economics & Policy (SWEEEP)
- A paper that has been retweeted by Jennifer Doleac (@jenniferdoleac)'s female job market candidates Twitter thread within the past 2 years

Your report and presentation should in general follow the following structure:

- Summary: a one-page/2-3 slide recap of the paper (slightly longer than typical ones because the audience has not listened to the paper yet)
- Discussion: as many bullet points/slides as needed that are some combination of
 - Framing within the literature
 - Summary of the paper's strengths
 - Weaknesses and constructive suggestions for improvement (which usually is the bulk of the report)

Your referee report will be evaluated on its thoughtfulness, clarity, and constructiveness. You should write your report as if you are writing to the editor of *JEEM*. You should also present your report to the editor (aka, the instructor and the rest of the class) in a 15-minute presentation.

Here is some reference materials for writing a good referee report:

- [Preparing a Referee Report: Guidelines and Perspectives](#)

- [Guidelines to Write a Referee Report by Andrea Passalacqua](#)
- [Suggestions on how to write a referee report by Ekaterina Zhuravskaya](#)
- [Guidelines for Referee Reports](#)

Paper Presentation

As a seminar course, you will be asked to present papers that are related to the topic of the week. Each student will need to present **three papers** during the semester.

- You will sign up for papers to present on or before 1/18, and present on your assigned dates
- You should select one paper from the list of papers that have not been selected to other students. If you feel strongly about presenting a relevant paper that is not on the list for a particular topic, please consult with me first.
- You will have 25 minutes to present the paper: the first 20 minutes should mimic a conference/workshop presentation, followed by your own critical evaluation of the paper (2 minutes) and Q&A (3 minutes)
- You should present the paper **as if** you were the actual author of the paper - which means you need to try your best to sell the paper in front of a skeptical audience.
- A typical economics presentation usually includes the following components:
 - Motivation (Big picture question, literature, research question, and contribution. Sometimes it also includes a preview of the results)
 - Institutional setting (the context of the study)
 - Data and empirical strategy (be sure to focus on the identification strategy if applicable)
 - Results
 - Discussion and conclusion
- Audience members should each prepare for at least one question to ask the presenter during and/or at the end of the presentation. I recommend glancing through (the abstract/introduction) of the paper before the presentation to help you formulate questions.

Research Proposal

You will write a research proposal that serves as a sketch of your final research paper. Unless otherwise permitted by the instructor, your research proposal should follow the introduction formula based on Steps 1 and 2 of [Jesse Shapiro's applied micro paper guideline](#). Specifically, your proposal should largely mimic the Shapiro structure:

- Paragraphs 1-2: Motivation. After reading these paragraphs, a reader in any field of economics should believe that if you answer your research question your paper will make an important contribution.
- Paragraphs 3-4: Challenges. These paragraphs explain why your research question has not already been answered, i.e., what are the central challenges a researcher must tackle to answer this question.
- Paragraph 5: This Paper. This paragraph states in a nutshell what the paper accomplishes and how.
- Paragraphs 6-7: Model. Summarize the key formal assumptions you will maintain in your analysis.
- Paragraphs 8-9: Data. Explain where you obtain your data and how you measure the concepts that are central to your study.
- Paragraphs 10-11: Methods. Explain how you take your model to the data and how you overcome the challenges you raised in paragraphs 3-4.
- Paragraphs 12-13: Findings. Describe the key findings. Make sure they connect clearly to the motivation in paragraphs 1-2.

- Paragraphs 14-15: Literature. Lay out the two main ways your paper contributes to the literature. Each paragraph should center around one contribution and should explain precisely how your paper differs from the most closely related recent work.

You do not need to have all the components fleshed out at this stage - for example, "*feel free to make up your results, within reason*" (Shapiro steps). However, you should have clear expectations as to what will be needed in the next months to complete the paper.

Reference: [Four steps to an applied micro paper by Jesse Shapiro](#)

Research Paper

You will write a full-length **individual** research paper due at the end of the semester. I expect a first draft of an eventual third-year paper (or even a job market paper), with original theoretical and/or empirical analyses.

If this is new work that has not been prepared for another class, a paper with preliminary results should suffice (i.e., you do not need 20 robustness checks). Alternatively, you can choose to advance/revise a paper that you have already made progress of in another class. If so, you must submit an existing version of the paper at the beginning of the semester and make substantive progress on the paper during the semester.

You are encouraged to use the paper as a stepping stone to your dissertation (Kills two birds with one stone, why not?). If you are working as a research assistant, you are highly encouraged to consult your supervisor(s)/advisor(s) for potential research topics.

Submission, formatting, and deadlines

All written work should be submitted electronically via e-Learning. All written work should be submitted by 11:59 pm on the due date. Late submission will be penalized by 10% per day unless explicit approval is granted by the instructor.

Additionally, as conventional in the economics profession, you are highly encouraged to use LaTeX to write your referee report, research proposal, and research paper. You are also encouraged to use Beamer to generate presentation slides. **Work submitted that are made with LaTeX/Beamer or another script-based compiler (e.g., Markdown, Sweave, Jupyter) will receive a 5% bonus** - though you are subject to the same formatting standards as those using traditional ways of word processing (MS Word/Powerpoint).

Class Policies

Use of Generative AI and Large Language Models

I view AI as a foundational tool for modern scientific research, just like calculators and search engines. Ways to use generative AI effectively is an emerging skill that could, and should, be learned, just like you learned how to use Google Scholar. Hence, unless otherwise stated, you are encouraged to complete work with the help of artificial intelligence tools and large language models (LLMs), including ChatGPT, GPT, DALL-E, Stable Diffusion, Midjourney, GitHub Copilot, and anything after, in an unrestricted fashion, for any purpose, at no penalty.

You should note that all large language models still have a tendency to make up incorrect facts and fake citations, code generation models have a tendency to produce inaccurate outputs, and solve mathematical problems with incorrect intermediate steps and final solutions. You will be responsible for any inaccurate, biased, offensive, or otherwise unethical content you submit regardless of whether it originally comes from you or a generative AI. You do not need to cite the use of generative AI in your work, but you should cite any human beings who contributed to your work.

The university's policy on plagiarism still applies to any uncited or improperly cited use of work by other human beings, or submission of work by other human beings as your own.

Academic Honesty:

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://sccr.dso.ufl.edu/process/student-conduct-code/>

Plagiarism:

The Student Honor Code and Student Conduct Code states that: "A Student must not represent as the Student's own work all or any portion of the work of another." Plagiarism includes but is not limited to:

- Stealing, misquoting, insufficiently paraphrasing, or patch-writing.
- Self-plagiarism, which is the reuse of the Student's own submitted work, or the simultaneous submission of the Student's own work, without the full and clear acknowledgment and permission of the Faculty to whom it is submitted.
- Submitting materials from any source without proper attribution.
- Submitting a document, assignment, or material that, in whole or in part, is identical or substantially identical to a document or assignment the Student did not author."

Attendance and Make-Up Work:

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/> In general, you are expected to be in class each day and submit all work on time on e-Learning.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students are notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled.

The only allowable purposes are: (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A class lecture is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To publish means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: On my honor, I have neither given nor received unauthorized aid in doing this

assignment. The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Plagiarism: The Student Honor Code and Student Conduct Code states that:

A Student must not represent as the Student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

- Stealing, misquoting, insufficiently paraphrasing, or patch-writing.
- Self-plagiarism, which is the reuse of the Student's own submitted work, or the simultaneous submission of the Student's own work, without the full and clear acknowledgment and permission of the Faculty to whom it is submitted.
- Submitting materials from any source without proper attribution.
- Submitting a document, assignment, or material that, in whole or in part, is identical or substantially identical to a document or assignment the Student did not author."

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the Notification to Students of FERPA Rights.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency

Room and Trauma Center website.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.

Important Dates

1/9: First day of classes

1/18: Paper presentation signup due

2/27: Referee report presentation (in class)

2/29: Referee report due

3/6, 3/8: Spring break; no class

3/28: Research proposal due

4/23: Final project presentation (in class)

4/24: Final paper due

Course Timetable

Note: the course timetable is alive and breathing, so it may evolve spontaneously as the course goes along.

Week	Tuesday	Thursday	Activity
8-Jan	Syllabus; Introduction	Introduction	
15-Jan	A Formal Model on Externality (PR Ch3)	A Formal Model on Externality (PR Ch3)	
22-Jan	Externality under Imperfect Information (PR Ch4)	Student Presentation	
29-Jan	Externality with Output Markets (PR Ch5)	Student Presentation	
5-Feb	Regulation, Monitoring, and Enforcement	Student Presentation	

Week	Tuesday	Thursday	Activity
12-Feb	Stated vs. Revealed Preference	Referee Report/Research Introduction Bootcamp	
19-Feb	Hedonics	Student Presentation	
26-Feb	Referee Report Presentation	Guest lecture: Dr. Sherry Qiao	Referee Report due
5-Mar	No class - Spring Break	No class - Spring Break	
12-Mar	Climate Impact on Agriculture	Student Presentation	
19-Mar	Climate Impact: Labor, health, adaptation	Student Presentation	
26-Mar	Air pollution	Student Presentation	Research Introduction due
2-Apr	Integrated Assessment: social cost of carbon and beyond	Guest Lecture: Dr. Weizhe Weng	
9-Apr	Water Pollution	Student Presentation	
16-Apr	Cost-benefit analysis	Student Presentation	
23-Apr	Final Project Presentation	No class - End of Semester	Research Paper due

Course Outline

Note: Bolded texts denote required readings.

Week 1: Introduction

- Topic: Overview of the field of environmental economics
- Readings:
 - **Phaneuf and Requate Ch. 1 and 2**
 - McCarthy, G. (2019). The role of environmental economics in US environmental policy. Review of Environmental Economics and Policy.

Week 2: First-best Environmental Policy: Instrument Equivalence

- Topic: Externality; Pigovian tax; Coase theorem; Cap-and-trade
- Readings:
 - **Phaneuf and Requate Ch. 3**
 - Goulder, L. H. (2013). Markets for pollution allowances: what are the (new) lessons?. Journal of economic perspectives, 27(1), 87-102.

- Fowlie, M., & Perloff, J. M. (2013). Distributing pollution rights in cap-and-trade programs: are outcomes independent of allocation?. *Review of Economics and Statistics*, 95(5), 1640-1652.
- Schmalensee, R., & Stavins, R. N. (2013). The SO₂ allowance trading system: The ironic history of a grand policy experiment. *Journal of Economic Perspectives*, 27(1), 103-122.
- Schmalensee, R., & Stavins, R. N. (2017). Lessons learned from three decades of experience with cap and trade. *Review of Environmental Economics and Policy*.

Week 3: First-best Environmental Policy: Instrument Divergence

- Topic: Prices versus quantities; Instrument divergence; Uncertainty and risk
- Readings:
 - **Phaneuf and Requate Ch. 4**
 - Weitzman, M.L. (1974). Prices vs. quantities. *The Review of Economic Studies*, 41(4), 477-491.
 - Carlton, D. W., & Loury, G. C. (1980). The limitations of Pigouvian taxes as a long-run remedy for externalities. *The Quarterly Journal of Economics*, 95(3), 559-566.
 - Weitzman, M. L. (2011). Fat-tailed uncertainty in the economics of catastrophic climate change. *Review of Environmental Economics and Policy*.
 - Goulder, L. H. (2020). Timing is everything: how economists can better address the urgency of stronger climate policy. *Review of Environmental Economics and Policy*.
- Presentation papers:
 - Kroetz, K., Sanchirico, J. N., & Lew, D. K. (2015). Efficiency costs of social objectives in tradable permit programs. *Journal of the Association of Environmental and Resource Economists*, 2(3), 339-366.
 - Meng, K. C. (2017). Using a free permit rule to forecast the marginal abatement cost of proposed climate policy. *American Economic Review*, 107(3), 748-784.
 - Fowlie, M., & Muller, N. (2019). Market-based emissions regulation when damages vary across sources: What are the gains from differentiation?. *Journal of the Association of Environmental and Resource Economists*, 6(3), 593-632.
 - Giglio, S., Maggiori, M., Rao, K., Stroebe, J., & Weber, A. (2021). Climate change and long-run discount rates: Evidence from real estate. *The Review of Financial Studies*, 34(8), 3527-3571.
 - Hernandez-Cortes, D., & Meng, K. C. (2023). Do environmental markets cause environmental injustice? Evidence from California's carbon market. *Journal of Public Economics*, 217, 104786.
 - Toyama Y. (2023). Dynamic Incentives and Permit Market Equilibrium in Cap-and-Trade Regulation. *American Economic Journal: Microeconomics* (forthcoming)
 - Zaklan, A. (2023). Coase and cap-and-trade: Evidence on the independence property from the European carbon market. *American Economic Journal: Economic Policy*, 15(2), 526-558.
 - Shapiro, J. S., & Walker, R. (2023). Is Air Pollution Regulation Too Stringent? Evidence from US Offset Markets. Working Paper.
 - Hong, H., Wang, N., & Yang, J. (2023). Mitigating disaster risks in the age of climate change. *Econometrica*, 91(5), 1763-1802.
 - Colmer, J., Martin, R., Muûls, M., & Wagner, U. J. (2023). Does pricing carbon mitigate climate change? Firm-level evidence from the European Union emissions trading scheme. *Review of Economic Studies* (forthcoming)

Week 4: Externality with Output Markets

- Topic: Regulating the environment when output markets are present
- Readings:

- **Phaneuf and Requate Ch. 5**
- Goulder, L. H., & Parry, I. W. (2008). Instrument choice in environmental policy. *Review of environmental economics and policy*
- Presentation papers:
 - Li, S., Linn, J., & Muehlegger, E. (2014). Gasoline taxes and consumer behavior. *American Economic Journal: Economic Policy*, 6(4), 302-342.
 - Fowlie, M., Reguant, M., & Ryan, S. P. (2016). Market-based emissions regulation and industry dynamics. *Journal of Political Economy*, 124(1), 249-302.
 - Bushnell, J., & Humber, J. (2017). Rethinking trade exposure: The incidence of environmental charges in the nitrogenous fertilizer industry. *Journal of the Association of Environmental and Resource Economists*, 4(3), 857-894.
 - Ayres, A. B., Meng, K. C., & Plantinga, A. J. (2021). Do environmental markets improve on open access? Evidence from California groundwater rights. *Journal of Political Economy*, 129(10), 2817-2860.
 - Cao, J., Ho, M. S., Ma, R., & Teng, F. (2021). When carbon emission trading meets a regulated industry: Evidence from the electricity sector of China. *Journal of Public Economics*, 200, 104470.
 - Browne, O. R., & Ji, X. J. (2023). The economic value of clarifying property rights: Evidence from water in Idaho's Snake River Basin. *Journal of Environmental Economics and Management*, 119, 102799.
 - Aronoff, D., & Rafey, W. (2023). Conservation priorities and environmental offsets: Markets for Florida wetlands (No. w31495). National Bureau of Economic Research.

Week 5: Environmental Policy in the Real World

- Topic: Command-and-control; Standard; Monitoring and enforcement; Strategic behavior
- Readings:
 - Gray, W. B., & Shimshack, J. P. (2011). The effectiveness of environmental monitoring and enforcement: A review of the empirical evidence. *Review of Environmental Economics and Policy*.
 - Lipscomb, M., & Mobarak, A. M. (2016). Decentralization and pollution spillovers: evidence from the re-drawing of county borders in Brazil. *The Review of Economic Studies*, 84(1), 464-502.
 - Shapiro, J. S., & Walker, R. (2018). Why is pollution from US manufacturing declining? The roles of environmental regulation, productivity, and trade. *American Economic Review*, 108(12), 3814-3854.
 - Burgess, R., Greenstone, M., Ryan, N., & Sudarshan, A. (2020). The consequences of treating electricity as a right. *Journal of Economic Perspectives*, 34(1), 145-169.
 - Zou, E. Y. (2021). Unwatched pollution: The effect of intermittent monitoring on air quality. *American Economic Review*, 111(7), 2101-2126.
- Presentations:
 - Hanna, R. (2010). US environmental regulation and FDI: evidence from a panel of US-based multinational firms. *American Economic Journal: Applied Economics*, 2(3), 158-189.
 - Duflo, E., Greenstone, M., Pande, R., & Ryan, N. (2013). Truth-telling by third-party auditors and the response of polluting firms: Experimental evidence from India. *The Quarterly Journal of Economics*, 128(4), 1499-1545.

- Li, S. (2018). Better lucky than rich? Welfare analysis of automobile licence allocations in Beijing and Shanghai. *The Review of Economic Studies*, 85(4), 2389-2428.
- Duflo, E., Greenstone, M., Pande, R., & Ryan, N. (2018). The value of regulatory discretion: Estimates from environmental inspections in India. *Econometrica*, 86(6), 2123-2160.
- Evans, M. F., Gilpatric, S. M., & Shimshack, J. P. (2018). Enforcement spillovers: Lessons from strategic interactions in regulation and product markets. *The Journal of Law and Economics*, 61(4), 739-769.
- Greenstone, Michael, Guojun He, Ruixue Jia, and Tong Liu. 2022. "Can Technology Solve the Principal-Agent Problem? Evidence from China's War on Air Pollution." *American Economic Review: Insights*, 4(1): 54-70.
- Blundell, W., Gowrisankaran, G., & Langer, A. (2020). Escalation of scrutiny: The gains from dynamic enforcement of environmental regulations. *American Economic Review*, 110(8), 2558-2585.
- He, G., Wang, S., & Zhang, B. (2020). Watering down environmental regulation in China. *The Quarterly Journal of Economics*, 135(4), 2135-2185.
- Jarvis, S., Deschenes, O., & Jha, A. (2022). The private and external costs of Germany's nuclear phase-out. *Journal of the European Economic Association*, 20(3), 1311-1346.
- Greenstone, M., & Nath, I. (2022). Do renewable portfolio standards deliver cost-effective carbon abatement?. University of Chicago, Becker Friedman Institute for Economics Working Paper, (2019-62).
- Agarwal, S., Han, Y., Qin, Y., & Zhu, H. (2023). Disguised pollution: Industrial activities in the dark. *Journal of Public Economics*, 223, 104904.

Week 6: Non-market valuation: an overview

- Topic: Applied welfare analysis; Stated vs. revealed preference
- Readings:
 - **Phaneuf and Raquete Ch. 14**
 - Kling, C. L., Phaneuf, D. J., & Zhao, J. (2012). From Exxon to BP: Has some number become better than no number?. *Journal of Economic Perspectives*, 26(4), 3-26.
 - Hausman, J. (2012). Contingent valuation: from dubious to hopeless. *Journal of economic perspectives*, 26(4), 43-56.
 - Johnston, R. J., Boyle, K. J., Adamowicz, W., Bennett, J., Brouwer, R., Cameron, T. A., ... & Vossler, C. A. (2017). Contemporary guidance for stated preference studies. *Journal of the Association of Environmental and Resource Economists*, 4(2), 319-405.
 - Hanley, N., & Czajkowski, M. (2019). The role of stated preference valuation methods in understanding choices and informing policy. *Review of Environmental Economics and Policy*.
 - Mendelsohn, R. (2019). An examination of recent revealed preference valuation methods and results. *Review of Environmental Economics and Policy*.
 - Alberini, A. (2019). Revealed versus stated preferences: what have we learned about valuation and behavior?. *Review of Environmental Economics and Policy*.
 - Lupi, F., Phaneuf, D. J., & von Haefen, R. H. (2020). Best practices for implementing recreation demand models. *Review of Environmental Economics and Policy*.
 - Stantcheva, S. (2023). How to run surveys: A guide to creating your own identifying variation and revealing the invisible. *Annual Review of Economics*, 15, 205-234.

No presentation this week.

Week 7: Hedonic model

- Topic: The hedonic model, its identification, and equilibrium sorting models
- Readings:
 - **Taylor, L. O. (2017). Hedonics. In A primer on nonmarket valuation, Chapter 7, 235-292.**
 - Kuminoff, N. V., Smith, V. K., & Timmins, C. (2013). The new economics of equilibrium sorting and policy evaluation using housing markets. *Journal of economic literature*, 51(4), 1007-1062.
 - Kuminoff, N. V., & Pope, J. C. (2014). Do "capitalization effects" for public goods reveal the public's willingness to pay?. *International Economic Review*, 55(4), 1227-1250.
 - Bishop, K. C., Kuminoff, N. V., Banzhaf, H. S., Boyle, K. J., von Gravenitz, K., Pope, J. C., ... & Timmins, C. D. (2020). Best practices for using hedonic property value models to measure willingness to pay for environmental quality. *Review of Environmental Economics and Policy*.
 - Banzhaf, H. S. (2021). Difference-in-differences hedonics. *Journal of Political Economy*, 129(8), 2385-2414.
- Presentations:
 - Black, S. E. (1999). Do better schools matter? Parental valuation of elementary education. *The quarterly journal of economics*, 114(2), 577-599.
 - Bayer, P., Ferreira, F., & McMillan, R. (2007). A unified framework for measuring preferences for schools and neighborhoods. *Journal of political economy*, 115(4), 588-638.
 - Greenstone, M., & Gallagher, J. (2008). Does hazardous waste matter? Evidence from the housing market and the superfund program. *The Quarterly Journal of Economics*, 123(3), 951-1003.
 - Bayer, P., Keohane, N., & Timmins, C. (2009). Migration and hedonic valuation: The case of air quality. *Journal of Environmental Economics and Management*, 58(1), 1-14.
 - Currie, J., Davis, L., Greenstone, M., & Walker, R. (2015). Environmental health risks and housing values: evidence from 1,600 toxic plant openings and closings. *American Economic Review*, 105(2), 678-709.
 - Muehlenbachs, L., Spiller, E., & Timmins, C. (2015). The housing market impacts of shale gas development. *American Economic Review*, 105(12), 3633-3659.
 - Bayer, P., McMillan, R., Murphy, A., & Timmins, C. (2016). A dynamic model of demand for houses and neighborhoods. *Econometrica*, 84(3), 893-942.
 - Haninger, K., Ma, L., & Timmins, C. (2017). The value of brownfield remediation. *Journal of the Association of Environmental and Resource Economists*, 4(1), 197-241.
 - Tanaka, S., & Zabel, J. (2018). Valuing nuclear energy risk: Evidence from the impact of the Fukushima crisis on US house prices. *Journal of Environmental Economics and Management*, 88, 411-426.
 - Bakkensen, L. A., & Barrage, L. (2022). Going underwater? Flood risk belief heterogeneity and coastal home price dynamics. *The Review of Financial Studies*, 35(8), 3666-3709.
 - Zivin, J. G., Liao, Y., & Panassie, Y. (2023). How hurricanes sweep up housing markets: Evidence from florida. *Journal of Environmental Economics and Management*, 118, 102770.
 - Cassidy, A., Meeks, R. C., & Moore, M. R. (2023). Cleaning up the Great Lakes: Housing market impacts of removing legacy pollutants. *Journal of Public Economics*, 226, 104979.
 - Christensen, P., Keiser, D. A., & Lade, G. E. (2023). Economic effects of environmental crises: Evidence from Flint, Michigan. *American Economic Journal: Economic Policy*, 15(1), 196-232.
 - Mamun, S., Castillo-Castillo, A., Swedberg, K., Zhang, J., Boyle, K. J., Cardoso, D., ... & Polasky, S. (2023). Valuing water quality in the United States using a national dataset on property values. *Proceedings of the National Academy of Sciences*, 120(15), e2210417120.

Week 8: Referee Report Presentation

No additional readings this week.

Week 9: Climate and Agriculture

- Topic: Climate impact on agriculture; Technological change; Irrigation
- Readings:
 - Mendelsohn, R., Nordhaus, W. D., & Shaw, D. (1994). The impact of global warming on agriculture: a Ricardian analysis. *The American economic review*, 753-771.
 - Schlenker, W., Michael Hanemann, W., & Fisher, A. C. (2005). Will US agriculture really benefit from global warming? Accounting for irrigation in the hedonic approach. *American Economic Review*, 95(1), 395-406.
 - Deschênes, O., & Greenstone, M. (2007). The economic impacts of climate change: evidence from agricultural output and random fluctuations in weather. *American economic review*, 97(1), 354-385.
 - **Schlenker, W., & Roberts, M. J. (2009). Nonlinear temperature effects indicate severe damages to US crop yields under climate change. *Proceedings of the National Academy of sciences*, 106(37), 15594-15598.**
 - Schlenker, W., & Lobell, D. B. (2010). Robust negative impacts of climate change on African agriculture. *Environmental Research Letters*, 5(1), 014010.
 - **Burke, M., & Emerick, K. (2016). Adaptation to climate change: Evidence from US agriculture. *American Economic Journal: Economic Policy*, 8(3), 106-140.**
 - Mendelsohn, R. O., & Massetti, E. (2017). The use of cross-sectional analysis to measure climate impacts on agriculture: theory and evidence. *Review of Environmental Economics and Policy*.
 - Blanc, E., & Schlenker, W. (2017). The use of panel models in assessments of climate impacts on agriculture. *Review of Environmental Economics and Policy*.
- Presentations:
 - Hornbeck, R., & Keskin, P. (2014). The historically evolving impact of the Ogallala aquifer: Agricultural adaptation to groundwater and drought. *American Economic Journal: Applied Economics*, 6(1), 190-219.
 - Hornbeck, R., & Keskin, P. (2015). Does agriculture generate local economic spillovers? Short-run and long-run evidence from the Ogallala Aquifer. *American Economic Journal: Economic Policy*, 7(2), 192-213.
 - Kala, N. (2017). Learning, adaptation, and climate uncertainty: Evidence from Indian agriculture. MIT Center for energy and environmental policy research working paper.
 - Hendricks, N. P. (2018). Potential benefits from innovations to reduce heat and water stress in agriculture. *Journal of the Association of Environmental and Resource Economists*, 5(3), 545-576.
 - Cui, X. (2020). Climate change and adaptation in agriculture: Evidence from US cropping patterns. *Journal of Environmental Economics and Management*, 101, 102306.
 - Aragón, F. M., Oteiza, F., & Rud, J. P. (2021). Climate change and agriculture: Subsistence farmers' response to extreme heat. *American Economic Journal: Economic Policy*, 13(1), 1-35.
 - Mérel, P., & Gammans, M. (2021). Climate Econometrics: Can the Panel Approach Account for Long-Run Adaptation?. *American Journal of Agricultural Economics*, 103(4), 1207-1238.

- Schlenker, W., & Taylor, C. A. (2021). Market expectations of a warming climate. *Journal of Financial Economics*, 142(2), 627-640.
- Cui, X., & Zhong, Z. (2023). Climate change, cropland adjustments, and food security: Evidence from China. *Journal of Development Economics*, 103245.
- Moscona, J., & Sastry, K. A. (2023). Does directed innovation mitigate climate damage? evidence from us agriculture. *The Quarterly Journal of Economics*, 138(2), 637-701.
- Dasgupta, A., & Ramirez, E. R. (2023). Explaining Rural Conservatism: Political Consequences of Technological Change in the Great Plains. *American Political Science Review* (forthcoming)

Week 10: Climate Impact: Labor, health, and adaptation

- Topic: Social consequences of climate change; Adaptation
- Readings:
 - Deschênes, O., & Greenstone, M. (2011). Climate change, mortality, and adaptation: Evidence from annual fluctuations in weather in the US. *American Economic Journal: Applied Economics*, 3(4), 152-185.
 - Hsiang, S. M., Burke, M., & Miguel, E. (2013). Quantifying the influence of climate on human conflict. *Science*, 341(6151), 1235367.
 - **Dell, M., Jones, B. F., & Olken, B. A. (2014). What do we learn from the weather? The new climate-economy literature. *Journal of Economic literature*, 52(3), 740-798.**
 - Heal, G., & Park, J. (2016). Reflections—temperature stress and the direct impact of climate change: a review of an emerging literature. *Review of Environmental Economics and Policy*.
 - **Auffhammer, M. (2018). Quantifying economic damages from climate change. *Journal of Economic Perspectives*, 32(4), 33-52.**
- Presentations:
 - Sekhri, S., & Storeygard, A. (2014). The impact of climate variability on crimes against women: Dowry deaths in India. *Journal of Development Economics*, 111: 212-223.
 - Barreca, A., Clay, K., Deschenes, O., Greenstone, M., & Shapiro, J. S. (2016). Adapting to climate change: The remarkable decline in the US temperature-mortality relationship over the twentieth century. *Journal of Political Economy*, 124(1), 105-159.
 - Zhang, P., Deschenes, O., Meng, K., & Zhang, J. (2018). Temperature effects on productivity and factor reallocation: Evidence from a half million Chinese manufacturing plants. *Journal of Environmental Economics and Management*, 88, 1-17.
 - Deryugina, T., Kawano, L., & Levitt, S. (2018). The economic impact of Hurricane Katrina on its victims: Evidence from individual tax returns. *American Economic Journal: Applied Economics*, 10(2), 202-233.
 - Adhvaryu, A., Kala, N., & Nyshadham, A. (2020). The light and the heat: Productivity co-benefits of energy-saving technology. *Review of Economics and Statistics*, 102(4), 779-792.
 - Engle, R. F., Giglio, S., Kelly, B., Lee, H., & Stroebel, J. (2020). Hedging climate change news. *The Review of Financial Studies*, 33(3), 1184-1216.
 - Park, R. J., Goodman, J., Hurwitz, M., & Smith, J. (2020). Heat and learning. *American Economic Journal: Economic Policy*, 12(2), 306-339.
 - Corno, L., Hildebrandt, N., & Voena, A. (2020). Age of marriage, weather shocks, and the direction of marriage payments. *Econometrica*, 88(3), 879-915.
 - Heutel, G., Miller, N. H., & Molitor, D. (2021). Adaptation and the mortality effects of temperature across US climate regions. *Review of Economics and Statistics*, 103(4), 740-753.

- Liu, M., Shamdassani, Y., & Taraz, V. (2023). Climate change and labor reallocation: Evidence from six decades of the Indian Census. *American Economic Journal: Economic Policy*, 15(2), 395-423.
- Colmer, J., & Doleac, J. L. (2022). Access to Guns in the Heat of the Moment: More Restrictive Gun Laws Mitigate the Effect of Temperature on Violence. *the Review of Economics and Statistics* (forthcoming)
- McGuirk, E. F., & Nunn, N. (2023). Transhumant pastoralism, climate change, and conflict in africa. *Review of Economic Studies* (forthcoming).

Week 11: Air Pollution

- Topic: Air pollution; Health impacts; Defensive actions and avoidance behavior;
- Readings:
 - **Graff Zivin, J., & Neidell, M. (2013). Environment, health, and human capital. *Journal of Economic Literature*, 51(3), 689-730.**
 - Chen, Y., Ebenstein, A., Greenstone, M., & Li, H. (2013). Evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River policy. *Proceedings of the National Academy of Sciences*, 110(32), 12936-12941.
 - Ebenstein, A., Lavy, V., & Roth, S. (2016). The long-run economic consequences of high-stakes examinations: Evidence from transitory variation in pollution. *American Economic Journal: Applied Economics*, 8(4), 36-65.
 - Arceo, E., Hanna, R., & Oliva, P. (2016). Does the effect of pollution on infant mortality differ between developing and developed countries? Evidence from Mexico City. *The Economic Journal*, 126(591), 257-280.
 - Deryugina, T., Heutel, G., Miller, N. H., Molitor, D., & Reif, J. (2019). The mortality and medical costs of air pollution: Evidence from changes in wind direction. *American Economic Review*, 109(12), 4178-4219.
 - **Currie, J., & Walker, R. (2019). What do economists have to say about the Clean Air Act 50 years after the establishment of the Environmental Protection Agency?. *Journal of Economic Perspectives*, 33(4), 3-26.**
 - Schmalensee, R., & Stavins, R. N. (2019). Policy evolution under the clean air act. *Journal of Economic Perspectives*, 33(4), 27-50.
 - Ito, K., & Zhang, S. (2020). Willingness to pay for clean air: Evidence from air purifier markets in China. *Journal of Political Economy*, 128(5), 1627-1672.
 - Greenstone, M., He, G., Li, S., & Zou, E. Y. (2021). China's war on pollution: Evidence from the first 5 years. *Review of Environmental Economics and Policy*, 15(2), 281-299.
- Presentations:
 - Currie, J., & Walker, R. (2011). Traffic congestion and infant health: Evidence from E-ZPass. *American Economic Journal: Applied Economics*, 3(1), 65-90.
 - Chang, T., Graff Zivin, J., Gross, T., & Neidell, M. (2016). Particulate pollution and the productivity of pear packers. *American Economic Journal: Economic Policy*, 8(3), 141-169.
 - Isen, A., Rossin-Slater, M., & Walker, W. R. (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*, 125(3), 848-902.
 - Deschenes, O., Greenstone, M., & Shapiro, J. S. (2017). Defensive investments and the demand for air quality: Evidence from the NOx budget program. *American Economic Review*, 107(10), 2958-2989.

- Hollingsworth, A., & Rudik, I. (2021). The effect of leaded gasoline on elderly mortality: Evidence from regulatory exemptions. *American Economic Journal: Economic Policy*, 13(3), 345-373.
- Fu, S., Viard, V. B., & Zhang, P. (2021). Air pollution and manufacturing firm productivity: Nationwide estimates for China. *The Economic Journal*, 131(640), 3241-3273.
- Schlenker, W., & Walker, W. R. (2016). Airports, air pollution, and contemporaneous health. *The Review of Economic Studies*, 83(2), 768-809.
- Chang, T. Y., Graff Zivin, J., Gross, T., & Neidell, M. (2019). The effect of pollution on worker productivity: evidence from call center workers in China. *American Economic Journal: Applied Economics*, 11(1), 151-172.
- Heissel, J. A., Persico, C., & Simon, D. (2022). Does pollution drive achievement? The effect of traffic pollution on academic performance. *Journal of Human Resources*, 57(3), 747-776.
- Bishop, K. C., Ketcham, J. D., & Kuminoff, N. V. (2023). Hazed and confused: the effect of air pollution on dementia. *Review of Economic Studies*, 90(5), 2188-2214.
- Huang, J., Xing, J., & Zou, E. Y. (2023). (Re) scheduling pollution exposure: The case of surgery schedules. *Journal of Public Economics*, 219, 104825.
- Garg, T., Jagnani, M., & Pullabhotla, H. K. (2023). Rural roads, farm labor exits, and crop fires. *American Economic Journal: Economic Policy*.

Week 12: Integrated Assessment

- Readings:
 - Keeler, B. L., Gourevitch, J. D., Polasky, S., Isbell, F., Tessum, C. W., Hill, J. D., & Marshall, J. D. (2016). The social costs of nitrogen. *Science advances*, 2(10).
 - Kling, C. L., Arriitt, R. W., Calhoun, G., & Keiser, D. A. (2017). Integrated assessment models of the food, energy, and water nexus: A review and an outline of research needs. *Annual Review of Resource Economics*, 9, 143-163.
 - **Antle, J. M., & Stöckle, C. O. (2017). Climate impacts on agriculture: insights from agronomic-economic analysis. *Review of Environmental Economics and Policy*.**
 - Rennert, K., Errickson, F., Prest, B. C., Rennels, L., Newell, R. G., Pizer, W., ... & Anthoff, D. (2022). Comprehensive evidence implies a higher social cost of CO2. *Nature*, 610(7933), 687-692.
 - **Carleton, T., Jina, A., Delgado, M., Greenstone, M., Houser, T., Hsiang, S., ... & Zhang, A. T. (2022). Valuing the global mortality consequences of climate change accounting for adaptation costs and benefits. *The Quarterly Journal of Economics*, 137(4), 2037-2105.**
 - Weng, W., Cobourn, K. M., Kemanian, A. R., Boyle, K. J., Shi, Y., Stachelek, J., & White, C. (2023). Quantifying Co-Benefits of Water Quality Policies: An Integrated Assessment Model of Nitrogen Management. *American Journal of Agricultural Economics* (forthcoming).
 - Zuidema, S., Liu, J., Chepeliev, M. G., Johnson, D. R., Baldos, U. L. C., Frolicking, S., ... & Hertel, T. W. (2023). US climate policy yields water quality cobenefits in the Mississippi Basin and Gulf of Mexico. *Proceedings of the National Academy of Sciences*, 120(43), e2302087120.

No presentation this week

Week 13: Water Pollution

- Topic: Water pollution; Health impacts; Point and non-point source pollution
- Readings:

- Fisher-Vanden, K., & Olmstead, S. (2013). Moving pollution trading from air to water: potential, problems, and prognosis. *Journal of Economic Perspectives*, 27(1), 147-172.
- **Rabotyagov, S. S., Kling, C. L., Gassman, P. W., Rabalais, N. N., & Turner, R. E. (2014). The economics of dead zones: Causes, impacts, policy challenges, and a model of the Gulf of Mexico hypoxic zone. *Review of Environmental Economics and Policy*.**
- Keiser, D. A., & Shapiro, J. S. (2019). Consequences of the Clean Water Act and the demand for water quality. *The Quarterly Journal of Economics*, 134(1), 349-396.
- Keiser, D. A., Kling, C. L., & Shapiro, J. S. (2019). The low but uncertain measured benefits of US water quality policy. *Proceedings of the National Academy of Sciences*, 116(12), 5262-5269.
- **Keiser, D. A., & Shapiro, J. S. (2019). US water pollution regulation over the past half century: burning waters to crystal springs?. *Journal of Economic Perspectives*, 33(4), 51-75.**
- Keiser, D. A., Olmstead, S. M., Boyle, K. J., Flatt, V. B., Keeler, B. L., Phaneuf, D. J., ... & Shimshack, J. P. (2022). The Evolution of the "Waters of the United States" and the Role of Economics. *Review of Environmental Economics and Policy*, 16(1), 146-152.
- Presentations:
 - Olmstead, S. M., Muehlenbachs, L. A., Shih, J. S., Chu, Z., & Krupnick, A. J. (2013). Shale gas development impacts on surface water quality in Pennsylvania. *Proceedings of the National Academy of Sciences*, 110(13), 4962-4967.
 - Aggeborn, L., & Öhman, M. (2021). The effects of fluoride in drinking water. *Journal of Political Economy*, 129(2), 465-491.
 - Paudel, J., & Crago, C. L. (2021). Environmental externalities from agriculture: evidence from water quality in the united states. *American Journal of Agricultural Economics*, 103(1), 185-210.
 - Hadachek, J. (2022). The cost of nitrate pollution in drinking water.
 - Marcus, M. (2022). Testing the water: Drinking water quality, public notification, and child outcomes. *Review of Economics and Statistics*, 104(6), 1289-1303.
 - Dave, D. M., & Yang, M. (2022). Lead in drinking water and birth outcomes: A tale of two water treatment plants. *Journal of Health Economics*, 84, 102644.
 - Hill, E. L., & Ma, L. (2022). Drinking water, fracking, and infant health. *Journal of Health Economics*, 82, 102595.
 - Keiser, D. A., Mazumder, B., Molitor, D., & Shapiro, J. S. (2023). Water Works: Causes and Consequences of Safe Drinking Water in America.
 - Liu, P., Wang, Y., & Zhang, W. (2023). The influence of the Environmental Quality Incentives Program on local water quality. *American Journal of Agricultural Economics*, 105(1), 27-51.
 - Dias, M., Rocha, R., & Soares, R. R. (2023). Down the River: Glyphosate Use in Agriculture and Birth Outcomes of Surrounding Populations. *Review of Economic Studies* (forthcoming).

Week 14: Benefit-cost Analysis and Distributional Impacts

- Topics: Benefit-cost analysis; Environmental Justice
- Readings:
 - **Banzhaf, H. S., Ma, L., & Timmins, C. (2019). Environmental justice: Establishing causal relationships. *Annual Review of Resource Economics*, 11, 377-398.**
 - Banzhaf, S., Ma, L., & Timmins, C. (2019). Environmental justice: The economics of race, place, and pollution. *Journal of Economic Perspectives*, 33(1), 185-208.

- OMB (2023). Guidance for assessing changes in environmental and ecosystem services in benefit-cost analysis. <https://www.whitehouse.gov/wp-content/uploads/2023/08/DraftESGuidance.pdf>
- **Hay and Xie (2023). Circular A-4: A Comparison between the 2023 Draft and the 2003 Circular.** <https://regulatorystudies.columbian.gwu.edu/circular-4-comparison-between-2023-draft-and-2003-circular>
- Presentations:
 - Wolverton, A. (2009). Effects of socio-economic and input-related factors on polluting plants' location decisions. *The BE Journal of Economic Analysis & Policy*, 9(1).
 - Currie, J., Greenstone, M., & Moretti, E. (2011). Superfund cleanups and infant health. *American Economic Review*, 101(3), 435-441.
 - Banzhaf, H. S., & Walsh, R. P. (2013). Segregation and Tiebout sorting: The link between place-based investments and neighborhood tipping. *Journal of Urban Economics*, 74, 83-98.
 - Bakkensen, L. A., & Ma, L. (2020). Sorting over flood risk and implications for policy reform. *Journal of Environmental Economics and Management*, 104, 102362.
 - Persico, C., Figlio, D., & Roth, J. (2020). The developmental consequences of superfund sites. *Journal of Labor Economics*, 38(4), 1055-1097.
 - Currie, J., Voorheis, J., & Walker, R. (2023). What caused racial disparities in particulate exposure to fall? New evidence from the Clean Air Act and satellite-based measures of air quality. *American Economic Review*, 113(1), 71-97.
 - Marion J., & West, J. (2023). Socioeconomic Disparities in Privatized Pollution Remediation: Evidence from Toxic Chemical Spills. *American Economic Journal: Applied Economics* (Forthcoming).
 - Christensen, P., & Timmins, C. (2023). The damages and distortions from discrimination in the rental housing market. *The Quarterly Journal of Economics*, 138(4), 2505-2557.

Alternative topics depending on student interest:

- Water scarcity: property rights, water markets, and social implications
- Enviro-development-economics: deforestation, sanitation, fuel use, health and livelihood in the developing world
- Conservation: land use, species, ecosystem services, and natural capital accounting