

ESP 168a - Methods of Environmental Policy Evaluation

Fall Quarter 2016

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Office Hours: Thursdays 2:30 – 4pm, 2135 Wickson Hall

Description:

Methods of Environmental Policy Evaluation (5) Lecture--3 hours; discussion--1 hour; term paper.
Prerequisite: Statistics 13; Economics 100 or Agricultural and Resource Economics 100A; Mathematics 16B or 21B; course 1; upper division standing. Evaluation of alternatives for solution of complex environmental problems; impact analysis, benefit-cost analysis, distributional analysis, decision making under uncertainty, and multi-objective evaluation.

Text:

There are required readings for most of the discussion sessions. These are listed below and will be posted on Canvas.

Suggested background readings are given for most lectures. Most of these are drawn from the books listed below, that are on reserve at Shields Library. These are not required, but will provide greater depth on topics of interest. Other background readings are posted on Canvas.

Lesser, Dodds, and Zerbe 1997. *Environmental Economics and Policy*. Addison-Wesley. (LDZ)

Boardman, Greenberg, Vining, and Weimer, 2001. *Cost-Benefit Analysis: Concepts and Practice*. Second Edition. (BGVW)

Assignments:

Case study readings for discussion section

3 problem sets

Mid-term (**Thursday October 27th**)

Group Project (2 written reports and oral presentation)

NOTE: THERE IS NO FINAL EXAM IN THIS COURSE

Grading:

Problem Set 1 (due October 4 th)	10%
Problem Set 2 (due October 11 th)	10%
Problem Set 3 (due October 20 th)	10%
Class Participation (discussion section):	15%
Class Project/Term Paper and Presentation:	40%
Mid-Term (October 27 th)	15%

Late Policy:

Do not turn in assignments late. Look at assignments early and plan ahead. Problem sets handed in late will automatically have 5 points deducted. Each additional day will mean 5 additional points deducted. Any work handed in more than a week late will not be graded.

Topics Covered, Required and Background Readings, and Assignments Due

WEEK 1 (September 19th – 23rd) -----

Thursday Lecture: Introduction to environmental policy analysis, steps in the policy analysis process, defining a problem, developing alternative solutions, predicting consequences, ranking outcomes, making a decision. ***Problem Set 1 Assigned***

Background Reading

LDZ, Chapters 5 and 6, pp.86-144.

WEEK 2 (September 26th – 30th) -----

Monday Section: Model development examples, EXCEL review, graphing.

Tuesday Lecture: Models: Developing a model, types of models, data sources. Intro to class project.

Thursday Lecture: Models: Evaluating models, model ensembles and uncertainty, communicating results. Other ways of predicting policy consequences.

Background Reading:

Prisley and Mortimer, 2004. “A Synthesis of Literature on Evaluation of Models for Policy Applications, with Implications for Forest Carbon Accounting”. *Forest Ecology and Management*, **198**, pp. 89-103.

WEEK 3 (October 3rd – 7th) -----

Monday Section: Modeling Case Study: Projecting Water Scarcity and Stress

Required Reading:

- Schewe et al., 2013. “Multimodel Assessment of Water Scarcity Under Climate Change”. *Proceedings of the National Academy of Sciences*, **111**, pp. 3245-3250
- Hejazi et al., 2015. “21st Century United States Emissions Mitigation Could Increase Water Stress More than the Climate Change it is Mitigating”. *Proceedings of the National Academy of Sciences*, **112**, pp. 10635-10640.
- Mankin et al., 2015. “The Potential for Snow to Supply Human Water Demand in the Present and Future”. *Environmental Research Letters*, **10**, pp. 114016

Tuesday Lecture: Introduction to cost-benefit analysis. Discounting. Environmental valuation: Ecosystem Services. ***Problem Set 1 Due. Problem Set 2 Assigned.***

Background Reading

LDZ, Chapter 11: Measuring Environmental Costs and Benefits, pp. 268-314

Thursday Lecture: Environmental valuation: Hedonic valuation and value of a statistical life (VSL). ***Project groups finalized.***

Background Reading

LDZ, Chapter 12: Measuring the Value of Life and Health, pp. 315-340

WEEK 4 (October 10th-14th) -----

Monday Section: Estimating Environmental Benefits Case Study: The Mercury and Air Toxics Standard

Required Reading:

- EPA, 2011. “Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards”:
 - Executive Summary ES1-ES20
 - Section 4.7 Mercury Benefits Analysis Modeling Methodology 4-38 – 4-48
 - Section 5.4.4 Economic Valuation Estimates 5-39 – 5-49
 - Section 5.4.5 Hospital Admissions Valuation 5-49 – 5-59
- Robinson, 2007. “How US Government Agencies Value Mortality Risk Reductions”, *Review of Environmental Economics and Policy*, **1**, 2, pp. 283-299.

Tuesday Lecture: Environmental valuation: Contingent valuation and travel-cost method.

Problem Set 2 Due.

Background Reading:

LDZ, Chapter 11: Measuring Environmental Costs and Benefits, pp. 268-314

BGVW, Chapter 14: Valuing Impacts Through Surveys, pp. 358-390

Thursday Lecture: Risk and uncertainty: Quantification of risk, sensitivity analysis, Monte-Carlo methods, value of information, risk aversion. ***Summary of project topics due. Problem Set 3 Assigned.***

Background Reading:

BGVW, Chapter 7: Dealing with Uncertainty, pp. 156-191

WEEK 5 (October 17th-21st) -----

Monday Section: Dealing with Risk and Uncertainty: Planning for Adaptation to Climate Change

Required Readings

- Hallegatte, 2009. “Strategies to Adapt to an Uncertain Climate Change”. *Global Environmental Change*, **19**, pp. 240-247.
- Hallegatte, S., 2006. “A cost–benefit analysis of the New Orleans Flood Protection System”, Regulatory Analysis 06-02. AEI-Brookings Joint Center. March 2006.

Tuesday Lecture: Risk and uncertainty: Decision-making under uncertainty, expected value calculations, robust decision-making, minimax, irreversibility and option values, diversification. Communicating uncertainty and risk.

Background Reading:

LDZ, Chapter 14: Risk, Uncertainty, and Environmental Policy, pp. 384-435.

BGVW, Chapter 8: Option Price and Option Value, pp. 192-212

Thursday Lecture: Measuring costs of environmental policy. Types of environmental policies. Optimal and second-best settings. General equilibrium effects. ***Problem Set 3 Due.***

Background Reading:

LDZ, Chapter 7: Policies to Address Efficiency Goals, pp. 145-180.

WEEK 6 (October 24th-28th) -----

Monday Section: Midterm Review.

Tuesday Lecture: Life-cycle assessment.

Background Reading

International Standards Organization, 1997. "Environmental Management – Lifecycle Analysis – Principles and Framework"

Thursday Lecture: *MIDTERM EXAM*

WEEK 7 (October 31st – November 4th) -----

Monday Section: LCA Case Study – Lifecycle Greenhouse Gas Emissions of Biofuels and the U.S. Renewable Fuel Standard

Required Reading:

- Browse through the EPA's website on the Renewable Fuel Standard at <https://www.epa.gov/renewable-fuel-standard-program>
- Look in detail at spreadsheet describing the EPA's LCA results for corn ethanol
- Searchinger et al. 2008. "Use of US Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change". *Science*. **319**, pp. 1238-1240. Also read the Supplementary Information pp. 1-19.
- [Optional: Rajagopal and Zilberman. "The Use of Environmental Life-Cycle Analysis for Evaluating Biofuels". *Giannini Foundation of Agricultural Economics*, pp 5-8.

Tuesday Lecture: Distributional impacts: Environmental justice. Pareto improvements and Kaldor-Hicks Criterion.

Background Reading:

Commission for Racial Justice, 1987, "Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites".

Thursday Lecture: Distributional impacts: International and inter-generational issues

Background Reading:

LDZ, Chapter 13: Discounting Environmental Benefits and Costs Over Time, pp. 341-384.

BGVW, Chapter 6: Discounting Future Benefits and Costs, pp. 120-155

WEEK 8 (November 7th – 11th) -----

Monday Section: Air Quality and Environmental Justice in the Bay Area

Required Reading

- Explore the EPA's Environmental Justice screening tool: <https://ejscreen.epa.gov/mapper/>. Read how the EJ Index is calculated at <https://www.epa.gov/ejscreen/environmental-justice-indexes-ejscreen>. Use the screening tool to make a side-by-side map showing Oakland. On the left map plot the EJ Index for NATA Air Toxics Cancer Risk. On the right plot the Environmental Indicator for NATA Air Toxics Cancer Risk. Think about why these two maps are different. Use the Print Screen button to save and print a copy of the map.
- Communities for a Better Environment, "Cumulative Impacts in East Oakland: Findings from a Community-Based Mapping Study".
- Bay Area Air Quality Management District, 2014. "Identifying Areas with Cumulative Impacts from Air Pollution in the San Francisco Bay Area". Read Methodology and Results (pp. 11-34)
- Bay Area Air Quality Management District, 2015. "Using the Product of Ranks to Calculate Disadvantage from CalEnviroScreen 2.0 Data"

Tuesday Lecture: Multi-Criteria Assessment.

Background Reading

LDZ, Chapter 10: Balancing Policy Goals, pp. 238-265

Thursday Lecture: Guest Lecture by Claire Jahns, Assistant Secretary of Natural Resources Climate Issues, California Natural Resources Agency.

WEEK 9 (November 14th – 18th) -----

Monday Section: Time to work on projects

Tuesday Lecture: In-depth case study: Social Cost of Carbon. *Project Part 1 Due.*

Thursday Lecture: Wrapping up: environmental policy analysis in practice

WEEK 10 (November 21st – 25th) -----

Monday Section: Discussion of the Social Cost of Carbon

Required Reading

- Interagency Working Group on Social Cost of Carbon, 2010. "Technical Support Document – Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866"
- Electric Power Research Institute 2014. "Understanding the Social Cost of Carbon: A Technical Assessment". Executive Summary.

Tuesday Lecture: Project presentations.

Thursday Lecture: THANKSGIVING!!

WEEK 11 (November 28th – December 2nd) -----

Monday Section: Time to work on projects

Tuesday Lecture: Project presentations.

Thursday Lecture: Project presentations.

Final Projects Due: December 2nd