

THE GEORGE WASHINGTON UNIVERSITY

Department of Economics

Environmental and Resource Economics, ECON 8395.10

Spring 2012

Monday 5:10-7:40 pm, Monroe 321

INSTRUCTOR: Arun Malik (Office Hours: Tu and Th 4:00-5:30 pm , Gov 305, Tel. 202-994-5471,  
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COURSE DESCRIPTION. The course will consist of a survey of the literature on environmental economics with an emphasis on environmental regulation, and an introduction to the literatures on common property resources, environment and development, and climate change. Exhaustible resource theory will not be covered. There will be some coverage of renewable resource theory in the segment on common property resources. The prerequisites for the course are Econ 8301 and 8302. Econ 8303 is desirable but not essential; if you have not had Econ 8303, I can give you some background reading on game theory.

REQUIREMENTS AND GRADING. Approximately four homework assignments will be handed out over the course of the semester. The assignments will take the form of problem sets or article reviews. Assignments will not be accepted after the day on which they are due; however, the assignment with the lowest grade will be dropped when calculating course grades.

There will be a midterm exam and a final exam. The midterm exam will consist of an in-class portion and a take-home portion. The in-class portion will last 75 minutes, and is tentatively scheduled for Monday, March 5<sup>th</sup>. The two-hour final exam will be entirely in-class and will be given during the final exam period.

Students have the option of writing a paper that critically reviews 3-5 articles on a specific topic. Writing a paper reduces the weight given to the homework and exams when calculating the course grade (details below). The paper must be at least 15 pages in length.

For students who choose not to write a paper, the course grade will be calculated using the following weights: homework – 30 percent, midterm exam – 35 percent, final exam -- 35 percent. Students who choose to write a paper will be able to shift a total of 20 percentage points from one or both exams to the paper, and 5 percentage points from the homework. Thus, the paper will count for 25 percent of the course grade.

TOPICS AND READINGS. A tentative list of topics to be covered and accompanying readings are presented below. Readings are divided into two categories: required and optional. Required readings are marked with an asterisk (\*). Required readings from outside the textbook will be made available via Blackboard or handed out in class. For each topic, required readings are listed in the order in which they should be read. Students should at least skim these readings before the class in which they are discussed. The textbook for the course is listed below together with the abbreviation used when referring to it in the reading list:

(B&O) William Baumol and Wallace E. Oates, *The Theory of Environmental Policy*, 2nd edition, paperback, Cambridge, 1988, ISBN 978-0521311120

This textbook is old, but for learning the basics of the economics of environmental regulation, it dominates the only current graduate-level textbook, by Hanley et al., *Environmental Economics in Theory and Practice*, 2<sup>nd</sup> ed., Palgrave Macmillan, 2007.

Some of the readings for the course are contained in the following edited volume, they are marked with a double asterisk (\*\*). This book is an optional, but recommended, purchase:

(Stavins) Robert N. Stavins (6<sup>th</sup> ed.), *Economics of the Environment, Selected Readings*, Norton, 2012.

Other books that you may find helpful are listed at the end of this document.

For the material covered in Topics 1 and 2, the following survey article should be read as we make our way through the two topics:

\*Gloria Helfand et al., "The Theory of Pollution Policy," Chapter 6 in the *Handbook of Environmental Economics, Vol. 1*, Elsevier, 2003

## **TOPIC 1: THEORY OF ENVIRONMENTAL REGULATION (5 classes)**

### **A. Basic Theory**

\*B&O, Chapters 1, 2, and 3 [pp. 1-35]

\*Catherine Kling and Zinhua Zhao, "On the long-run efficiency of auctioned vs. free permits," *Economic Letters* vol. 69, pp. 235–238, 2000.

\*John Pezzey, "Emission Taxes and Tradeable Permits: A Comparison of Views on Long-Run Efficiency," *Environmental and Resource Economics*, vol. 26, No. 2, October 2003.

\*\*Lawrence Goulder and Ian Parry, "Instrument Choice in Environmental Policy," *Review of Environmental Economics and Policy*, vol. 2, issue 2, pp. 152-174, 2008.

Paul Burrows, "Nonconvexities and the Theory of External Cost," in *The Handbook of Environmental Economics*, ed. by D. Bromley, Basil Blackwell, 1995.

Scott R. Milliman and Raymond Prince, "Firm incentives to promote technological change in pollution control," *Journal of Environmental Economics and Management*, 17:247–265, 1989.

Till Requate and Wolfram Unold, "Environmental policy incentives to adopt advanced abatement technology: Will the true ranking please stand up?," *European Economic Review*, vol. 47, issue 1, pp. 125-146, 2003.

Leonid Hurwicz, "Revisiting Externalities," *Journal of Public Economic Theory*, vol. 1, pp. 225-45, 1999.

Ross McKittrick and R.A. Collinge, "Linear Pigouvian taxes and the optimal size of a polluting industry," *Canadian Journal of Economics*, vol. 33, pp. 1106-1119, 2000.

Daniel Spulber, "Effluent Regulation and Long-Run Optimality," *Journal of Environmental Economics and Management*, Vol. 12, 1985, pp. 103-116.

W. David Montgomery, "Markets in Licenses and Efficient Pollution Control Programs," *Journal of Economic Theory*, vol. 5, pp. 395-418, 1972.

Catherine Kling and Jonathan Rubin, "Bankable permits for the control of environmental pollution," *Journal of Public Economics* 64: 101-115, 1997.

## B. Uncertainty and Asymmetric Information

\*B&O, Chapter 5 [pp. 57-78]

\*Robert N. Stavins, "Correlated Uncertainty and Policy Instrument Choice," *Journal of Environmental Economics and Management*, Vol. 30, 1996, pp. 218-232.

\*Richard Newell and William A. Pizer, "Regulating Stock Externalities Under Uncertainty," *Journal of Environmental Economics and Management*, vol. 45, No. 2, Supplement 1, pp. 416-432, 2003.

Marc Roberts and Michael Spence, "Effluent Charges and Licenses under Uncertainty," *Journal of Public Economics*, vol. 5, pp. 193-208, 1976.

Kathleen Segerson, "Uncertainty and Incentives for Nonpoint Pollution Control," *Journal of Environmental Economics and Management*, Vol. 15, 1988, pp. 87-98.

Juan-Pablo Montero, "A simple auction mechanism for the optimal allocation of the commons," *American Economic Review*, forthcoming.

Tracy Lewis, "Protecting the Environment when Costs and Benefits are Privately Known," *RAND Journal of Economics*, 27, pp. 819-47, 1996.

Martin Weitzman, "Prices vs. Quantities," *Review of Economic Studies* 41:477-91, 1974. [A more readable generalization of this classic article is: Martin Weitzman, "Optimal Rewards for Economic Regulation," *American Economic Review*, 68(4), September 1978, pp. 683-691.]

Frank C. Krysiak and Iris Maria Oberauner, "Environmental Policy a La Carte: Letting Firms Choose Their Regulation," *Journal of Environmental Economics and Management*, 2011.

## C. Market Imperfections

\*B&O, Chapter 6, pp. 79-86 only

\*Robert Hahn, "Market Power and Transferable Property Rights," *Quarterly Journal of Economics*, vol. 99, pp. 753-765, November 1984.

\*Charles Kolstad, "The Double Dividend" (pp. 255-259) in *Environmental Economics*, 2<sup>nd</sup> ed., Oxford University Press, 2010.

\*Lawrence Goulder, "Environmental Policy Making in a Second-Best Setting," *Journal of Applied Economics*, vol. 1, no.2, pp. 279-328, 1999.

L. Bovenberg, "Environmental Taxation and the 'Double Dividend': An Updated Reader's Guide," *International Tax and Public Finance*, vol. 6, no. 3, pp. 421-43, 1999

Lawrence Goulder, et al, "The Cost-Effectiveness of Alternative Instruments for Environmental Protection in a Second-Best Setting," *Journal of Public Economics*, Vol. 72, pp. 329-360, 1999.

Stephen Hamilton and David Zilberman, "Green Markets, Eco-Certification, and Equilibrium fraud" *Journal of Environmental Economics and Management*, Vol. 52, issue 3, pp. 627-644, 2006.

Wallace Oates and Diana Strassman, "Effluent Fees and Market Structure," *Journal of Public Economics* 24: 29-46, 1984.

### Topic 1C: Market Imperfections (cont.)

Arun Malik, "Further Results on Permit Markets with Market Power and Cheating," *Journal of Environmental Economics and Management*, vol. 44, no. 3, pp. 371-390, 2002.

A. Lans Bovenberg and Ruud A. de Mooij, "Environmental Levies and Distortionary Taxation," *American Economic Review* 84:1085-89, 1994.

### D. Liability Rules and Enforcement

\*Kathleen Segerson, "Liability and penalty structures in policy design," in *The Handbook of Environmental Economics*, D. Bromley (ed.). Oxford: Basil Blackwell, 1995.

\*Charles Kolstad, T. Ulen and G. Johnson, "Ex Ante Regulation vs. Ex Post Liability for Harm: Substitutes or Complements?" *American Economic Review* 80: 888-901, 1990.

\*Winston Harrington, "Enforcement leverage when penalties are restricted," *Journal of Public Economics* 37: 29-53, 1988.

Peter Menell, "The limitations of legal institutions for addressing environmental risks," *Journal of Economic Perspectives* 5: 93-113, 1991.

Thomas H. Tietenberg, "Indivisible Toxic Torts: The Economics of Joint and Several Liability," *Land Economics*, 65: 305-319, 1989.

### E. Voluntary Approaches

\*Kathleen Segerson and Thomas J. Miceli, "Voluntary Environmental Agreements: Good or Bad News for Environmental Protection?" *Journal of Environmental Economics and Management*, 36:109-30, 1998.

Matt Kotchen, "Green Markets and Private Provision of Public Goods," *Journal of Political Economy*, vol. 114, pp. 816-834, 2006.

John W. Maxwell, Thomas P. Lyon and Steven C. Hackett, "Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism," *Journal of Law and Economics*, 43:583-617, 2000.

Thomas P. Lyon and John W. Maxwell, "Self-Regulation, Taxation and Public Voluntary Environmental Agreements", *Journal of Public Economics* 87:1453-89, 2003.

Seema Arora and Timothy Cason, "An Experiment in Voluntary Environmental Regulation: Participation in EPA's 33/50 Program," *Journal of Environmental Economics and Management*, vol. 28, pp. 271-86, 1995.

Juan-Pablo Montero, "Voluntary Compliance with Market-Based Environmental Policy: Evidence from the US Acid Rain Program," *Journal of Political Economy* 107:998-1033, 1999.

M.F. Teisl, B. Roe, and R.L. Hicks, "Can Eco-Labels Tune a Market?: Evidence from Dolphin-Safe Labeling," *Journal of Environmental Economics and Management* 43:339-59, 2002.

## TOPIC 2: EMPIRICAL ANALYSES OF REGULATORY PERFORMANCE (2 classes)

- \*Michael Greenstone and Ted Gayer, "Quasi-experimental and Experimental Approaches to Environmental Economics," *Journal of Environmental Economics and Management*, vol. 51, issue 1, pp. 21-44, 2009.
- \*Wallace Oates, Paul Portney and Albert McGartland, "The Net Benefits of Incentive-based Regulation: A Case Study of Environmental Standard Setting," *American Economic Review*, 79(5), pp.1233-42, 1989.
- \*Curtis Carlson, D. Burtraw, M. Cropper and K. Palmer, "Sulfur Dioxide Control by Electric Utilities: What Are the Gains from Trade?" *Journal of Political Economy* 108: 1292-1326, 2003.
- \*Nicholas Muller and Robert Mendelsohn, "Efficient Pollution Regulation: Getting the Prices Right," *American Economic Review*, vol. 99, no. 5, pp. 1714-1739, 2009.
- \*Andrew Foster *et al.*, "Voluntary Compliance, Pollution Levels, and Infant Mortality in Mexico," *American Economic Review*, 99(2):191-97, 2009.
- Lucas Davis, "The Effect of Driving Restrictions on Air Quality in Mexico City," *Journal of Political Economy* vol. 116, pp. 38-81, 2008.
- Michael Greenstone, "The Impacts of Environmental Regulations on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufacturers," *Journal of Political Economy*, vol. 110, 2002.
- Scott Atkinson and Tom Tietenberg, "Market Failure in Incentive-Based Regulation: The Case of Emissions Trading," *Journal of Environmental Economics and Management*, vol. 21, 1991, pp. 17-31.
- G. D. Libecap and Z.K. Hansen, "Small Farms, Externalities, and the Dust Bowl of the 1930s," *Journal of Political Economy*, 112(3), 665-694, 2004.
- Paul Joskow *et al.*, "The Market for Sulfur Dioxide Emissions," *American Economic Review* 88:669-85, 1998.
- Hilary Sigman, "A Comparison of Public Policies for Lead Recycling," *Rand Journal of Economics* 26:452-78, 1995.
- Robert Hahn, "The impacts of economics on environmental policy," *Journal of Environmental Economics and Management* 39(3): 375-399, 2000.
- Maureen Cropper, "Has economic research answered the needs of environmental policy?" *Journal of Environmental Economics and Management* 39(3): 328-350, 2000.

## TOPIC 3: VALUATION OF ENVIRONMENTAL AMENITIES (1 class)

### A. Basic Theory

- \*Maureen L. Cropper and Wallace E. Oates, "Environmental Economics: A Survey," *Journal of Economic Literature*, Vol. 30, No. 2, 1992, **pp. 700-722 (Section IV) only**.
- \*Chapters 3 and 4 in Nancy Bockstael and Kenneth McConnell, *Environmental and Resource Valuation with Revealed Preferences: A Theoretical Guide to Empirical Models*, Springer 2006.
- A. Myrick Freeman, Chapters 1,2, 3, and 4.

### TOPIC 3: VALUATION OF ENVIRONMENTAL AMENITIES (cont.)

#### B. Valuation Methods

\*EPA, "Analyzing Benefits," Chapter 7 in *Guidelines for Preparing Economic Analyses*, National Center for Environmental Economics, December 2010.

\*\*Peter A. Diamond and Jerry A. Hausman, "Contingent Valuation: Is Some Number Better than No Number," *Journal of Economic Perspectives*, vol. 8, no. 4, Fall 1994, pp. 45-64.

A. Myrick Freeman, Chapters 11 and 13

Paul R. Portney, "The Contingent Valuation Debate: Why Economists Should Care," Symposium on Contingent Valuation, *Journal of Economic Perspectives*, vol. 8, no. 4, Fall 1994, pp. 3-17. [Reprinted in Stavins.]

V. Kerry Smith, "Nonmarket Valuation of Environmental Resources: An Interpretive Appraisal," *Land Economics*, vol. 69, 1993, pp. 1-26.

Harrison, D. and D. Rubinfeld, "Hedonic housing prices and the demand for clean air," *Journal of Environmental Economics and Management* 5: 81-102, 1978.

Nancy E. Bockstael, Kenneth E. McConnell and Ivar E. Strand, "Recreation," in *Measuring the Demand for Environmental Quality*, ed. by J.B. Braden and C.D. Kolstad, North-Holland, 1991.

### TOPIC 4: COMMON PROPERTY RESOURCES (2 classes)

#### A. Basic Theory

\*Glenn G. Stevenson, *Common Property Economics*, Cambridge University Press, 1991, Chapters 1, 2, and 3, including appendices.

\*Pranab Bardhan and Chris Udry, Sections II and III, pp. 169-177 in *Development Microeconomics*, Oxford University Press, 1999.

H. Scott Gordon. "The Economic Theory of a Common-Property Resource: The Fishery" *Journal of Political Economy* 62, 2 (April 1954): 124-142.

Garret Hardin, "The Tragedy of the Commons," *Science*, 162(3859), pp. 1243-1248, 1968.

E. Ostrom, J. Burger, C. Field, R. Norgaard and D. Policansky, "Revisiting the Commons: Local Lessons, Global Challenges," *Science*, 284, pp. 278-282, 1999.

Jean-Marie Baland and Jean-Phillipe Platteau, "Economics of Common Property Management Regimes," Chapter 4 in *Handbook of Environmental Economics, Vol. 1*, Elsevier, 2003.

Daniel W. Bromley, *Making the Commons Work*, ed. by, Institute for Contemporary Studies Press, 1992.

#### TOPIC 4: COMMON PROPERTY RESOURCES (cont.)

##### B. Extensions of the Basic Theory

\*Matthew Kotchen and Stephen Salant, "A Free Lunch in the Commons," *Journal of Environmental Economics and Management*, vol. 61, no. 3, pp. 245-253, 2011.

\*Jeff Dayton-Johnson and Pranab Bardhan, "Inequality and Conservation on the Local Commons: A Theoretical Exercise," *Economic Journal*, Vol. 112, No. 481, pp. 577-602, 2002.

David Levhari and Leonard Mirman, "The Great Fish War: An Example Using a Dynamic Cournot-Nash Solution," *Bell Journal of Economics* 11:322-334, 1980.

Stephen Polasky, N. Tarui, G. Ellis and C. Mason, "Cooperation in the Commons," *Economic Theory*, 2006.

Paul Seabright, "Managing Local Commons: Theoretical Issues in Incentive Design," *Journal of Economic Perspectives*, Fall 1993, Vol. 7, No. 4, pp. 113-134.

##### C. Social Norms

\*E. Ostrom, "Collective Action and the Evolution of Social Norms," *Journal of Economic Perspectives*, 14(3), pp. 137-158, 2000.

R. Sethi and E. Somanathan, "The Evolution of Social Norms in Common Property Resource Use," *American Economic Review*, 86(4), pp. 766-788, 1996.

#### TOPIC 5: ENVIRONMENT AND DEVELOPMENT (2 classes)

##### A. Environmental Kuznets Curve

\*Gene Grossman and Alan Krueger, "Economic Growth and the Environment," *Quarterly Journal of Economics*, vol. 110, no. 441, May, 1995.

\*W.T. Harbaugh, A. Levinson and D.M. Wilson, "Reexamining the empirical evidence for an Environmental Kuznets Curve," *Review of Economics and Statistics*, 84(3):541-551, 2002.

\*Richard Carson, "The Environmental Kuznets Curve: Seeking Empirical Regularity and Theoretical Structure," *Review of Environmental Economics and Policy*, vol. 4, no. 1, pp. 3-23, 2010.

William Brock and M. Scott Taylor, "The Green Solow Model," *Journal of Economic Growth*, vol. 15, no. 2, pp. 127-153, 2010.

Radoslaw Stefanski, "The mechanics of the 'Green Solow Model'," working paper, Oxcarre, Oxford University, October 2010.

S. Dasgupta, B. Laplante, H. Wang and D. Wheeler, "Confronting the Environmental Kuznets Curve," *Journal of Economic Perspectives*, 16(1): 147-168, 2002.

Douglas Holtz-Eakin, Douglas & Thomas Selden, "Stoking the fires? CO2 emissions and economic growth," *Journal of Public Economics*, Elsevier, vol. 57(1), pp. 85-101, May 1995.

Robert Deacon and Catherine Norman "Does the Environmental Kuznets Curve Describe How Individual Countries Behave?," *Land Economics*, vol. 82(2), pp. 291 - 315, 2006.

J. Andreoni and A. Levinson, "The simple analytics of the environmental Kuznets curve," *Journal of Public Economics*, 80: 269-286, 2001.

## TOPIC 5: ENVIRONMENT AND DEVELOPMENT (cont.)

### B. Natural Resource Curse

- \*Jeffrey Sachs and Andrew Warner, "The curse of natural resources" *European Economic Review* 45, pp. 827-33, 2001.
- \*Halvor Mehlum, Karl Moene, and Ragnar Torvik, "Institutions and the resource curse," *The Economic Journal* 116 (508), pp. 1–20, 2006.
- \*Ragnar Torvik, "Why do some resource-abundant countries succeed while others do not?," *Oxford Review of Economic Policy*, vol. 25, no. 2, pp. 241-246, 2009.
- Christa Brunschweiler and Edwin Bulte, "The Resource Curse Revisited and Revised: A Tale of Paradoxes and Red Herrings," *Journal of Environmental Economics and Management*, vol. 55, issue 3, pp. 248-264, 2008.
- Frederick van der Ploeg and Steven Poelhekke, "The pungent smell of "red herrings": Subsoil assets, rents, volatility and the resource curse," *Journal of Environmental Economics and Management*, vol. 60, issue 3, pp. 44-55, 2010.
- Ragnar Torvik, "Natural Resources, Rent Seeking and Welfare" *Journal of Development Economics*, 67, 455-70, 2002
- Michael Alexeev and Robert Konrad, "The Elusive Curse of Oil" *Review of Economics and Statistics*, 91(3): 586-598, 2009.
- Frederick van der Ploeg, "Natural Resources: Curse or Blessing?," *Journal of Economic Literature*, vol. 49, no 2, pp. 366-420, 2011.
- Jeffrey A. Frankel, "The Natural Resource Curse: A Survey," HKS Faculty Research Working Paper Series, RWP10-005, John F. Kennedy School of Government, Harvard University, 2010.

## TOPIC 6: CLIMATE CHANGE (2 classes)

- \*EPA, "Discounting Future Benefits and Costs," Chapter 6 in *Guidelines for Preparing Economic Analyses*, National Center for Environmental Economics, December 2010.
- \*\*Robert Pindyck, "Uncertainty in Environmental Economics," *Review of Environmental Economics and Policy*, vol. 1, no.1, pp. 45-65, 2007.
- \*Nicholas Stern, "The Economics of Climate Change," *American Economic Review: Papers and Proceedings*, vol. 98, no.2, pp. 1-37, 2008.
- \*Geoffrey Heal, "The economics of climate change: a post-Stern perspective," *Climatic Change*, vol. 96, no. 3, pp. 275-297, 2009.
- \*\*Joseph Aldy, et al., "Designing Climate Mitigation Policy," *Journal of Economic Literature*, vol. 48, no. 4, pp. 903-934, 2010.
- Kolstad, C.D. and M. Toman, "The Economics of Climate Change Policy" in *The Handbook of Environmental Economics*, Vol. 3, J. Vincent and K.-G. Maler (eds.), Elsevier – North Holland, 2005.
- Martin Weitzman, "The Stern Review on the Economics of Climate Change," *Journal of Economic Literature*, vol. 45, no. 3, pp. 703-724, 2007.

**TOPIC 6: CLIMATE CHANGE** (cont.)

Nicholas Stern, *The Economics of Climate Change: The Stern Review*, Cambridge University Press, 2007. [Also available online at: [http://www.hm-treasury.gov.uk/sternreview\\_index.htm](http://www.hm-treasury.gov.uk/sternreview_index.htm)]

William D. Nordaus and J. Boyer, *Warming the World: Economic Models of Global Warming*, MIT Press, 2000.

William Pizer, "The Optimal Choice of Climate Change Policy in the Presence of Uncertainty," *Resource and Energy Economics* 21: 255-287, 1999.

## OTHER RELEVANT BOOKS

- Douglas Bohi and Michael Toman, *Analyzing Nonrenewable Resource Supply*, Resources for the Future, 1984. [A sophisticated, but accessible, development of the theory of resource supply and its implications for empirical analysis; uses a discrete time framework.]
- Bromley, Daniel, *The Handbook of Environmental Economics*, Basil Blackwell, 1995. [A very useful compendium of up-to-date survey papers in both environmental and resource economics.]
- Patricia Champ, K.J. Boyle, and T.C. Brown, eds. 2003. *A Primer on Nonmarket Valuation*. Kluwer Academic Press: Boston. [A very comprehensive and readable survey of the range of techniques for estimating environmental benefits and their application.]
- Jon M. Conrad and C.C. Clark, *Natural Resource Economics: Notes and Problems*, Cambridge Press, 1987.
- Partha Dasgupta, *The Control of Resources*, Harvard University Press, 1982. [An insightful but rather idiosyncratic discussion of environmental and renewable resource problems; only assumes calculus.]
- Partha Dasgupta and Geoffrey Heal, *Economic Theory and Exhaustible Resources*, Cambridge University Press, 1979. [An excellent, albeit dated, text on natural resource economics. Does not make use of optimal control theory, but is still analytically quite sophisticated and emphasizes economic intuition.]
- A.M. Freeman III, *The Measurement of Environmental and Resource Values*, 2<sup>nd</sup> ed., Resources for the Future Press, 2003. [An excellent, exhaustive treatment of both the theory and application of methods for estimating environmental and resource values.]
- N. Hanley, J.F. Shogren, and B. White, *Environmental Economics in Theory and Practice*, 2<sup>nd</sup> ed., Palgrave Macmillan, 2007. [A modern treatment of environmental economics, but unfortunately not as lucid as the textbook by Baumol and Oates.]
- Per-Olov Johansson, *Cost-Benefit Analysis of Environmental Change*, Cambridge University Press, 1993. [Succinct exposition of issues that arise in benefit-cost analyses of environmental and resource policies. Primarily devoted to theory but includes a chapter that discusses some very topical applications of benefit-cost analysis.]
- Per-Olov Johansson, *The Economic Theory and Measurement of Environmental Benefits*, Cambridge University Press, 1987. [A succinct exposition of the theory of benefits estimation. Not as encyclopedic as AMF and not as up-to-date, but contains a slightly more rigorous development of the basic theory.]
- Charles Kolstad, *Environmental Economics*, 2<sup>nd</sup> ed., Oxford University Press, 2010. [Differs from other texts in that it covers a number of interesting topics that are typically ignored; limited use of advanced mathematics.]
- Karl-Goran Maler and Jeffrey Vincent (eds.), *Handbook of Environmental Economics*, 3 vols., Elsevier, 2003-2005. [Part of Elsevier's Handbooks in Economics series; compendium of survey articles on numerous facets of environmental economics.]
- Philip A. Neher, *Natural Resource Economics*, Cambridge University Press, 1990. [A text designed for readers with a limited economics background. Covers a fair bit of ground at a very leisurely pace. Limited use is made of optimal control theory.]
- Roger Perman, M. Common, Y. Ma, J. McGilvray, *Natural Resource and Environmental Economics*, 3<sup>rd</sup> ed., Addison Wesley, 2003. [Good coverage of both environmental and resource economics with limited use made of math.]
- David W. Pearce and R. Kerry Turner, *Economics of Natural Resources and the Environment*, Johns Hopkins University Press, 1990. [A fairly good text that only requires knowledge of calculus; stronger on environmental economics than resource economics.]