

Economics 477
Environmental and Natural
Resource Economics
1-2:20 MW, 119 Maxey
Fall 2017

Professor Jan Crouter
W46 Maxey (Environment Studies Center)
Office Hours: TuTh 10-11:30, F 11-noon,¹
and by appointment
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Course Web Page: found on CLEo at <https://cleo.whitman.edu/portal/>.

Text: Tietenberg, Tom, and Lynne Lewis. 2015. *Environmental & Natural Resource Economics*. 10th ed., Pearson Education, Inc. (now published by Routledge). A copy of the book has been placed on three-hour reserve in the library.

Additional Readings: These are posted on CLEo and noted with a (C). Most are available from the Penrose Memorial Library's digital and hardcopy holdings. URLs are provided for the digital materials which are not available through the library.

Course Outline: [* indicates a recommended reading which we will likely cover in class; ** indicates a reading to refresh your knowledge of certain topics from the principles and intermediate theory courses.]

1) Introduction

A) What is Environmental and Natural Resource Economics About?

Tietenberg & Lewis, Chap. 1.

* Fullerton, Don, and Robert Stavins. 1998. How Economists See the Environment. *Nature* 395 (6701). 1 October: 433-434. (C).

*Venkatachalam, L. 2007. Environmental Economics and Ecological economics: Where they can converge? *Ecological Economics* 61:550-558. (C).

*Venkatachalam, L. 2008. Behavioral Economics for Environmental Policy. *Ecological Economics* 67:640-645. (C).

B) Economic Principles

**Review the efficiency and market failure concepts from Intermediate Microeconomics (and Principles of Microeconomics) if necessary. (These include allocative and productive efficiency in partial equilibrium; components of Pareto efficiency in general equilibrium; and deadweight losses arising from market power, information problems, externalities and public goods situations). In addition, review the basics of regression (especially if you've not taken Econ 327) because we will refer to empirical analyses of environmental and natural resource matters throughout the course. These can be found in the textbook for Econ 307 (in various chapters and in the appendix on pp. 700-707), which has been placed on 3-hour reserve at the library:

Pindyck, Robert S. and Daniel L. Rubinfeld. 2013. *Microeconomics*. 8th ed. Upper Saddle New River, New Jersey: Pearson/Prentice-Hall.

¹ Friday office hours will typically go 'til noon. If a Friday office hour goes 'til 11:30 AM, I'll announce this beforehand. There will be no office hour on Friday, November 10, 2017.

B) Economic Principles (cont.)

1) Efficiency and Sustainability

Tietenberg & Lewis, Chap. 5.

*Brown, Gardner, Trista Patterson and Nicholas Cain. 2011. The Devil in the Details: Non-Convexities in Ecosystem Service Provision. *Resource and Energy Economics* 33: 355-365. (C)

*Heal, Geoffrey. 2012. Reflections—Defining and Measuring Sustainability. *Review of Environmental Economics and Policy* 6 (1) (Winter 2012): 147-163. (C).

2) Market Failure

Tietenberg & Lewis, Chap. 2 again.

*Cox, M. and J.M. Ross. 2011. Robustness and Vulnerability of Community Irrigation Systems: The Case of the Taos Valley Acequias. *Journal of Environmental Economics and Management* 61:254-266. (C).

*Dietz, Thomas, et al. 2003. The Struggle to Govern the Commons. *Science* 302 (12 December 2002): 1907-1912. (C).

“Dibs” on paper topics due, Wednesday, September 13, 2017

Highly Recommended: Individual ½ hour appointments with [Roger Stelk](#), week of Monday-Friday, September 18-22, 2017

3) Benefit-Cost Analysis and Valuation Techniques

a) Benefit-Cost Analysis Theory

Tietenberg & Lewis, Chaps. 3 and 4.

U.S. Office of Management and Budget. 2003. *Circular A-4: Regulatory Analysis* (At: <https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>, accessed August 17, 2017.) (C). See especially section E.

* Farrow, Scott. 2013. How (Not) to Lie with Benefit-Cost Analysis. *The Economists' Voice* 10(1): 45-50. (C)

**Read these if you do not remember Hicksian demand curves (aka compensated demand curves) and compensating variation in Econ 307:

Robert H. Frank. 2001. Appendix 4: Additional Topics in Demand Theory. In *Microeconomics and Behavior*, 4th ed. McGraw-Hill/Irwin. (Formerly at: <http://www.mhhe.com/economics/frank4/student/appendixes/appendix4.mhtml>, accessed August 15, 2007.) (C)

Perloff, Jeffrey M. 2009. Compensating and Equivalent Variation and Consumer Surplus. In Supplemental Material to accompany Chap. 9 of *Microeconomics*, 5th ed. Pearson-Addison Wesley. (At: http://wps.aw.com/bp_perloff_microecon_7/242/61990/15869527.cw/content/index.html, accessed August 17, 2017.) (C)

a) Benefit-Cost Analysis Theory (cont.)

Flores, Nick. 2003. Chap. 2, Conceptual Framework for Nonmarket Valuation. In Champ, Patricia, et al., eds., *A Primer on Nonmarket Valuation*. Norwell, Massachusetts: Kluwer Academic Publishers. (C)

*Tunçel, Tuba and James K. Hammitt. 2014. A New Meta-Analysis on the WTP/WTA Disparity. *Journal of Environmental Economics and Management* 68 (2014): 175-187. (C)

b) A SKIM of Examples of Some Non-Market Valuation Techniques (I will be selective and will provide material in class)

1) Averting Cost Method

Abdalla, Charles W., Brian A. Roach, and Donald J. Epp. 1992. Valuing Groundwater Quality Changes Using Averting Expenditures: An Application to Groundwater Contamination. *Land Economics* 68(2): 163-169. (C)

2) Travel Cost Methods

Landry, Craig E., et al. 2016. Addressing Onsite Sampling in Analysis of Recreation Demand: Economic Value and Impact of Visitation to Cape Hatteras National Seashore. *Marine Resource Economics* 31(3): 301-322. (C)

Leggett, C.G., Scherer, N., Curry, M.S., Bailey, R. and Haab, T.C., 2014. Assessing the Economic Benefits of Reductions in Marine Debris: a Pilot Study of Beach Recreation in Orange County, California. Report of Industrial Economics, Incorporated prepared for Marine Debris Division National Oceanic and Atmospheric Administration. (At: <https://marinedebris.noaa.gov/file/2574/download?token=zIPamF9O>, accessed August 16, 2017.) (C)

3) Hedonic Price Method

Scorse, Jason, Frank Reynolds, and Amanda Sackett. 2015. Impact of Surf Breaks on Home Prices in Santa Cruz, CA. *Tourism Economics* 21(2) (April): 409-418. (C)

*Netusil, et al. 2010. Estimating the Demand for Tree Canopy: A Second-Stage Hedonic Analysis in Portland, Oregon. *Land Economics* 86(2) (May): 281-293. (C)

4) Contingent Valuation and Contingent Choice/Choice Experiment Methods

Loomis, John and Luis Santiago. 2013. Economic Valuation of Beach Quality Improvements: Comparing Incremental Attribute Values from Two Stated Preference Valuation Methods. *Coastal Management* 41(1): 75-86. (C)

Peng, Marcus and Kirsten L.L. Oleson. 2017. Beach Recreationists' Willingness to Pay and Economic Implications of coastal Water Quality Problems in Hawaii. *Ecological Economics* 136(1): 41-52. (C)

*5) Benefits Transfer

Johnston, Robert J., et al. 2015. Introduction to Benefit Transfer Methods. Chapter 2 in R.J. Johnston, et al. (eds.), *Benefit Transfer of Environmental and Resource Values: A Guide for Researchers and Practitioners*, Springer, pp. 19-59. (C)

6) Valuation of Mortality and Health Risk Reductions

Viscusi, W. Kip. 2015. Pricing Lives for Corporate and Governmental Risk Decisions. *Journal of Benefit Cost Analysis* 6 (2): 227–246. (C) (See esp'ly pp. 227-234.)

Brajer, Victor, Jane Hall, and Frederick W. Lurmann. 2011. “Valuing Health Effects: The Case of Ozone and Fine Particles in Southern California.” *Contemporary Economic Policy* 29(4) (October): 524–535. (C)

* c) Additional Topics for Benefit-Cost Analysis

Arrow, K., et al. 2013. Determining Benefits and Costs for Future Generations. *Science* 341 (26 July 2013): 349-350. (C)

Denny, Eleanor and Jurgen Weiss. 2015. Hurry or Wait—The Pros and Cons of Going Fast or Slow on Climate Change. *The Economists' Voice* 12(1): 19-24. (C)

Nordhaus, William D. 2017. Revisiting the Social Cost of Carbon. *PNAS* 114(7) (February 14, 2017): 1518-1523. (C)

*Arrow, Kenneth, et al. 1996. Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation? *Science* 272 (April 12): 221-222. (C)

*4) Equity Considerations

Williams III, Robertson C., et al. 2015. The Impacts of a US Carbon Tax across Income Groups and States. *Resources* (September 2015): 25-29. (At: <http://www.rff.org/research/publications/impacts-us-carbon-tax-across-income-groups-and-states>, accessed August 16, 2017.) (C)

_____. 2014. Air Quality and Race: The Colour of Pollution. *The Economist*. 24 May. (At: <http://www.economist.com/news/united-states/21602735-air-getting-cleaner-less-so-non-whites-colour-pollution>, accessed August 16, 2017.) (C)

2) Environmental Economics

A) Forms of Environmental Policy

1) Coase Solution

Coase, Ronald H. 1960. The Problem of Social Cost. *Journal of Law and Economics* 3 (October): 1-44. (See <http://macedonia.uom.gr/~esartz/teaching/genvecon/coase.pdf> for a shortened version, accessed July 11, 2014.) (C)

*Libecap, Gary D. 2014. Addressing Global Environmental Externalities: Transactions Costs Considerations. *Journal of Economic Literature* 52(2):424-479. (C)

*Anderson, Terry L. and Dominic P. Parker. 2013. Transaction Costs and Environmental Markets: The Role of Entrepreneurs. *Review of Environmental Economics and Policy* 7(2): 259-275. (C)

Paper proposals due, Wednesday, October 4, 2017

2) Environmental Common Law (we'll likely skim this topic)

*Three companion articles that might be interesting, but are not required:

Buck, Stuart. 2008. The Common Law and the Environment in the Courts. *Case Western Reserve Law Review* 58(3): 621-646. (C) (Pages 622-630 outline a description of environmental common law.)

Yandle, Bruce. 2008. The Common Law and the Environment in the Courts: Discussion of Code Law and Common Law. *Case Western Reserve Law Review* 58(3): 647-661. (C)

Antolini, Denise. 2008. Attacking Bananas and Defending Environmental Common Law. *Case Western Reserve Law Review* 58(3): 663-672. (C)

3) Regulation (Command and Control and Incentive-Based Regulation)

Tietenberg and Lewis, Chap. 14.

*Goulder, Lawrence H. 2013. Markets for Pollution Allowances: What Are the (New) Lessons? *Journal of Economic Perspectives* 27 (1) (Winter): 87-102. (C)

* 4) Other Policies (Government Provision of Environmental Goods and Services, Voluntary Measures, Information Provision)

Loomis, John B. 2002. Economic Rationale for Continued Government Ownership of Land. Chap. 3 in *Integrated Public Lands Management*, 2nd ed. New York: Columbia University Press. (C)

National Parks Centennial Issue of *PERC Reports*. 34(1) (Summer 2015). (At: http://www.perc.org/sites/default/files/pdfs/PERCReports_Summer2015_FINAL-WEB_1.pdf, accessed August 16, 2017.) (C)

Wang, Uclia. 2014. New Technology Tools Aim to Reduce Water Use. *The Wall Street Journal* 18 May. (C)

Yu, Fei. 2012. Participation of Firms in Voluntary Environmental Protection Programs: An Analysis of Corporate Social Responsibility and Capital Market Performance. *Contemporary Economic Policy* 30(1) (January): 13-28. (C)

B) U.S. Environmental Policy

Handout based upon various sources, including:

Tietenberg & Lewis, Chaps. 15-19.

Sunstein, Cass R. 2017. Changing Climate Change, 2009-2016. *Harvard Environmental Law Review*, Forthcoming. Posted March 6, 2017 at https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2927812_code647786.pdf?abstractid=2927812&mirid=1&type=2, accessed August 16, 2017.) (C)

3) Natural Resource Economics

A) Non-Renewable Resources

1) Energy and Mineral Resources: Theory and Policy

Tietenberg & Lewis, Chaps. 6 and 7.

*Livernois, John. 2009. On the Empirical Significance of the Hotelling Rule. *Review of Environmental Economics and Policy* 3(1) (Winter): 22-4. [\(C\)](#)

*Österle, Ines. 2012. The Logic Behind the Green Paradox (May 31, 2012). *Review of Environment, Energy and Economics (Re3)*. (Available at SSRN: <https://ssrn.com/abstract=2071721>, accessed August 17, 2017.) [\(C\)](#)

Partial draft + outline for peer feedback due, Wednesday, November 8, 2017
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*2) Recycling of (Non-) Renewable Resources

Tietenberg & Lewis, Chap. 8.

B) Renewable Resources: Theory and Policy

1) Fish

Tietenberg & Lewis, Chap. 12.

Beddington, J.R., et al. 2007. Current Problems in the Management of Marine Fisheries. *Science* 316 (June 22): 1713-1716. [\(C\)](#)

*Birkenbach, Anna M., et al. 2017. Catch Shares Slow the Race to Fish. *Nature* 544 (13 April 2017): 223-226 plus (At: <https://www.nature.com/nature/journal/v544/n7649/pdf/nature21728.pdf>, accessed August 16, 2017.) [\(C\)](#)

Peer feedback due, Wednesday, November 15, 2017

2) Biodiversity, Ecosystem Services (I'll be selective)

Krutilla, John V. 1967. Conservation Reconsidered. *American Economic Review* 57(4) (September): 777-786. [\(C\)](#)

*Goulder, Lawrence H. and Donald Kennedy. 2011. Interpreting and Estimating the Value of Ecosystem Services. Chap. 2 in Peter Kareiva, et al., *Natural Capital: Theory and Practice of Mapping Ecosystem Services*. Oxford University Press. [\(C\)](#)

*Murdoch, W., et al. 2007. Maximizing Return on Investment in Conservation. *Biological Conservation* 139 (3-4) (October): 376-388. [\(C\)](#)

2) Biodiversity, Ecosystem Services (cont.)

*Tietenberg & Lewis, Chap. 13

*Langpap, Christian and Joe Kerkvliet. 2012. Endangered Species Conservation on Private Land: Assessing the Effectiveness of Habitat Conservation Plans. *Journal of Environmental Economics and Management* 64(1): 1-15. (C)

3) Forest Resources

Tietenberg & Lewis, Chap. 11

Two companion articles:

Donovan, Peter. 2010. Managing for a Whole Forest. *ManagingWholes.com*. June 10. (At: <http://managingwholes.com/bobleo.htm>, accessed August 17, 2017.) (C)

Bruce, Bob, 2012. Oregon Plantation Finds its Niche. *TimberWest Magazine*, January/February. (At: http://www.forestnet.com/TWissues/Jan_feb_12/oregon_plantation.php, accessed August 17, 2017.) (C)

*Braxton Little, Jan. 2016. California Plans to Log its Drought-Killed Trees. *High Country News* (8 August). (At: <http://www.hcn.org/issues/48.13/california-plans-to-log-its-drought-killed-trees>, accessed August 17, 2017.) (C)

*Henderson, James, et al. 2009. The Impact of Forestry-Related Ordinances on Timber Harvesting in St. Tammany Parrish, Louisiana. *Contemporary Economic Policy* 27(1) (January): 67-75. (C)

*Angelsen, Arild. 2010. Policies for Reduced Deforestation and their Impact on Agricultural Production. *PNAS* 107(46) (November 16, 2010): 19639-19644. (C)

* C) Resource Scarcity (and Sustainability & Growth)

Brown, Stephen P. A., and Daniel Wolk. 2000. Natural Resource Scarcity and Technological Change. *Economic and Financial Review* (First Quarter): 2-13. (C)

Boyd, James. 2013. The Limits to Ingenuity: Innovation as a Response to Ecological Loss. *Resources* 182 (2013): 41-45. (http://www.rff.org/rff/documents/RFF-Resources-182_web.pdf), accessed July 3, 2013.) (C)

Papers due and class presentations, Monday, December 4, 2017
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Exam 2: 9:00-11:00 AM on Tuesday, December 12, 2017

Schedule and Grading:

	Date	Percentage Weight in Final Course Grade
Class Participation	throughout the semester	10
Exam 1	W 10/25/2017, in class	25
Exam 2	W 12/12/2017, 9-11	25
Paper		
a) Dibs Due	W 9/13/2017 via email	
b) Proposal	W 10/4/2017, in class and by email	10
c) Partial Draft and Outline Due	W 11/8/2017, in class and by email	5
d) Partial Draft Peer Feedback due	W 11/15/2017, in class	
e) Paper Due	M 12/4/2017, in class	25
f) Presentations	M 12/4/2017, in class	(part of class participation)

Notes:

The requirements for this course include two exams, class participation, and a multi-part paper assignment for the course project.

The theme for this semester's paper project is interstate transmission of oil and natural gas in the U.S., and is inspired by news coverage of some controversial oil and natural gas pipeline projects. Very early in the semester, each student will select their particular topic within the theme and submit a two-page proposal on the paper he or she will write and present to the class at the end of the course. On Monday, December 4, 2017 the final papers are due, and will be presented in class. Details about the course project will be forthcoming.

There will be two closed book/closed note exams. The first will deal with the introductory material and the section on environmental economics. The second exam will cover natural resource economics, but it will draw upon the introductory material, too. All material covered in class lectures and discussions and assigned readings is fair game for the exams. Copies of exams and exam keys for Fall 2015 and Fall 2016 are available through [CLEo](#).

Class participation is a significant factor in your grade. Full class participation implies that you read the material before class, and that you contribute to a class discussion on the topic of the day (for which you will receive outlines/questions in advance) and/or with a show-and-tell contribution. I will provide an interim assessment of your participation during the semester.

Copyright Notice (because I've been burned):

The syllabus, course description, handouts, exams, problem sets, assignment descriptions and all lectures for this course are copyrighted by Professor Crouter; there are some materials copyrighted by others as well. Students enrolled in the class have access to all the materials produced by Professor Crouter and may share them with other students enrolled in the course. No student may otherwise reproduce, share, distribute, or display any of these materials without the express written consent of the copyright holder. Any infringement with the sale or not-for-fee sharing of any course materials is a violation of copyright law and, in some cases, Whitman College's position on academic dishonesty (see the Student Handbook) and will be treated accordingly. Your acceptance of this policy is understood by your enrollment in the course. Withdrawing or dropping the course does not absolve you from this responsibility.