

Department of Agricultural and Resource Economics  
University of Maryland  
Fall 2009

## **AREC 453: Natural Resources and Public Policy**

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Prerequisites: Intermediate microeconomics (ECON 306 or equivalent)  
Calculus (MATH 220 or equivalent)

### **Course Description**

This is an advanced course covering the ways in which economics is used to analyze natural resource policy issues. We will cover the basic principles and methods economists have developed to characterize the efficient use of natural resources ranging from minerals and energy to fisheries and other wildlife, forestry, and water. We will study the kinds of problems commonly encountered in our actual uses of natural resources and their root causes in the ways that markets function. We will use our understanding of those root causes to see what kinds of policies ought, in principle, to remedy those problems. And we will look at ways of determining how well different kinds of policies work in actual practice using the tools of quantitative economic analysis.

If you'd like to know more about me, you can get information on my background and work at [http://www.arec.umd.edu/People/Faculty/Lichtenberg\\_Erik/index.cfm](http://www.arec.umd.edu/People/Faculty/Lichtenberg_Erik/index.cfm), which also contains a link to my personal web page.

### **Reference Material**

The required text is Barry Field, Natural Resource Economics: An Introduction, Second Edition (Waveland Press 2008). There will be some other required readings on specific topics from various periodicals; they will be posted electronically on ELMS in advance of each lecture. The course outline below contains a preliminary list of these other required readings. I may find other readings while I'm preparing each topic, so you can expect the reading assignments to change from this list. You should check ELMS several

times a week for updates. Updated reading assignments and the associated articles will be posted electronically on ELMS.

Several blogs have interesting material on natural resource economics, including topics that will be covered in this course. I strongly recommend checking out Environmental Economics at <http://www.env-econ.net/> on a regular basis. Econbrowser at <http://www.econbrowser.com/> is mainly concerned with macroeconomics and trade but also has coverage of energy issues that is well worth reading. We will use current material from these and other blogs from time to time. If you encounter something you find interesting on one of these blogs, feel free to bring it up for discussion at the beginning of class.

## Course Requirements

There will be a number of homework assignments, a midterm, a course project, and a final exam. The final grade will be weighted as follows:

Homework	10%
Project	25%
Midterm exam	25%
Final exam	40%

**Homework.** There will be a number of homework assignments designed to give you experience with using economic models to analyze natural resource policy issues. All of these assignments will be posted on ELMS as well as handed out in class. Due dates will be listed on the problem set and in the announcements section of ELMS. Homework is due at the beginning of class on the due date or as otherwise indicated on ELMS. Assignments turned in late will be penalized 5% for each day late. **Late homework assignments will not be accepted after the beginning of the first review session in which correct answers are presented, which in most cases will be the afternoon after the due date.**

**Midterm exam.** There will be one midterm exam in October, most likely on October 22. The exam will last 75 minutes and will cover the material discussed up until that date. Once the date of the exam is finalized, it will be posted on ELMS. **Makeups for midterms missed due to emergency or illness will be considered only if you notify me (by email or voicemail if not in person) before the start of the exam. You will need to provide documentation of the illness or emergency. Makeups for reasons other than emergency or illness will not be considered.**

**Project.** The project for this class involves conducting an economic analysis of a natural resource policy issue as part of a group and will feature a group in-class presentation (5% of the final grade) and an individually written paper (20% of the final grade). The project is to conduct an evidence-based assessment of a specific policy proposal and will need to include:

- An identification of the economic forces at work in the problem identified in the question. Questions containing the word “should” typically have some sort of market failure involved; any market failures should be identified and analyzed.
- A formal qualitative analysis of how those economic forces work.
- A quantitative analysis of the economic forces involved.
- Specifics about the mechanisms through which the policies being proposed to make improvements will remedy the market failure(s).
- Specifics about the magnitude of the policies being proposed, e.g., how large remedial taxes, quotas or other limits on the activity causing the problem, etc., should be.
- A quantitative assessment of whether the benefits of the proposed policy or action will exceed the costs.
- Identification and discussion of potential obstacles to implementation or limitations of the proposed policy.

I will provide a list of acceptable topics. **Project papers turned in late will be assessed the same penalties as late homework.**

***Final Exam.*** The final exam will be given Tuesday, December 15, at 8 am. It will last 2 hours and will cover all of the material in the course, including material covered in student project presentations.

## **Academic Integrity**

I expect every student in this course to conform to the University’s Code of Academic Integrity, available on the Web at <http://www.shc.umd.edu/code.html>.

All quizzes and exams should be entirely your own work. You are welcome to cooperate on homework assignments but each of you should turn in your own version of the assignment. The in-class presentation, of course, necessarily involves cooperation but the paper—which must cover the entire topic, not just a portion you as an individual may have worked on—must be written individually.

You should know what plagiarism is and avoid it. Your class project should be written entirely in your own words. You should give complete references for ideas and data; failure to do so will be treated as a case of academic dishonesty.

## **CourseEvalUM Fall 2009**

You will have the opportunity to give me anonymous and confidential feedback on this course through the online course evaluation system, CourseEvalUM. I take this feedback seriously: Every year I make changes in the way I teach based on the previous year's feedback. CourseEvalUM will be open for you to complete your evaluation of this and other fall semester courses between Tuesday, December 1 and Sunday, December 13 at [www.courseevalum.umd.edu](http://www.courseevalum.umd.edu). If you complete all of your evaluations each semester, you will have the privilege of accessing online at Testudo the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

## Course Outline, Preliminary Reading List and Tentative Schedule

### Part I: Methods of Analysis

#### A. Overview of Natural Resources in the Economy (September 1)

Field, chapters 1 and 2.

#### B. Time and Discounting (September 3)

Field, chapter 3

#### C. Analysis of Discrete Investments: Energy Conservation (September 8)

Joseph Eto, Suzie Kito, Leslie Shown, and Richard Sonneblick, “Where Did the Money Go? The Cost and Performance of the Largest Commercial Sector DSM Programs”, The Energy Journal 21(2000), 23-49.

Lorna Greening, David L. Greene, and Carmen Difiglio, “Energy Efficiency and Consumption—the Rebound Effect—A Survey”, Energy Policy 28(2000), 389-401.

#### D. Efficiency and Sustainability (September 10)

Field, chapter 5

#### E. Markets, Efficiency, and Market Failures (September 15)

Field, chapters 5 and 6.

#### F. Policies for Correcting Market Failures (September 17)

Field, chapter 7

Lawrence H. Goulder and Ian W.H. Parry, “Instrument Choice in Environmental Policy”, Review of Environmental Economics and Policy 2(2008), 152-174.

### Part II: Water

#### A. Water Law and Policy (September 22)

Field, chapter 15, pages 287-282

Robert Glennon, “The Price of Water”, Journal of Land Resources and Environmental Law 24(2004), 337-342.

Robert Glennon, “Our Water Supply, Down the Drain”, Washington Post, August 23, 2009.

### B. Water Pricing (September 24)

Field, chapter 15, pages 292-297

Robert Glennon, "The Price of Water", Journal of Land Resources and Environmental Law 24(2004), 337-342.

High Sibly, "Efficient Urban Water Pricing", Australian Economic Review 39(2006), 227-237.

### C. Water Markets (September 29)

Field, chapter 15, pages 297-308.

Howard Chong and David Sunding, "Water Markets and Trading", Annual Review of Environment and Resources 31(2006), 239-264.

Jedidiah Brewer, Robert Glennon, Alan Ker, and Gary Libecap, "Water Markets in the West: Prices, Trading and Contractual Forms", Economic Inquiry 46(2006), 91-112.

## Part III: Fisheries

### A. Fisheries in Trouble: Overview (October 1)

Field, chapter 13

Ray Hilborn et al., "State of the World's Fisheries", Annual Review of the Environment and Resources 28(2003), 359-399.

### B. Fishery Dynamics and Equilibrium under Open Access (October 6)

Field, chapter 13.

### C. Fishery Policy in the US and Beyond (October 8-10)

Field, chapter 13,

Ray Hilborn, J.M. (Lobo) Oresanz, and Ana M. Parma, "Institutions, Incentives, and the Future of Fisheries", Philosophical Transactions of the Royal Society B 360(2005), 47-57.

Richard A. Wallace and Kristen M. Fletcher, "Understanding Fisheries Management, Second Edition", Publication 00-0005 of the Mississippi-Alabama Sea Grant Consortium.

Christopher Costello, Steven D. Gaines, and John Lynham, "Can Catch Shares Prevent Fisheries Collapse?", Science 321(2008), 1678-1681.

Boris Worm et al., "Rebuilding Global Fisheries", Science 325(2009), 578-585.

## PART IV. Exhaustible Resources: Minerals and Energy

### A. Economics of Mineral Extraction (October 27-29)

Field, chapter 10

### B. Recent Trends and Future Prospects in Oil Markets (November 3-5)

James D. Hamilton, "Understanding Crude Oil Prices", Department of Economics, University of California San Diego, June 4, 2008.  
Energy Information Agency, International Energy Outlook 2009, Department of Energy, Washington DC, May 2009, chapter 2.  
OPEC, "World Oil Outlook 2009", Vienna, Austria 2009.

## PART V: Forestry

### A. Economically Efficient Forest Management (November 10)

Field, chapter 11.

FAO, "State of the World's Forests", Rome, 2005, chapter 1.

FAO, "Global Forest Resource Assessment", Rome, 2005, chapter 2.

### B. Management of US National Forests (November 12)

Jeffrey R. Vincent and Clark S. Binkley, "Efficient Multiple-Use Forestry May Require Land-use Specialization", Land Economics 69(1993), 370-376.

Roger A. Sedjo, "Does the Forest Service Have a Future?", Regulation 23(2000), 51-55.

Ross W. Gorte, "Below-Cost Timber Sales: Overview", CRS Report 95-15, Congressional Research Service, Washington, DC, December 20, 1994.

US General Accounting Office, "Annual Costs of Forest Service's Timber Sales Program Are Not Determinable", GAO-01-1101R, Washington, DC, September 21, 2001.

## PART VI: Natural Resources and Economic Growth (November 17)

Field, chapter 20.