UNIVERSITY OF OREGON

Environmental Studies

Winter 2012

ENVS 335 – Allocating Scarce Environmental Resources

Lectures: T, Th 10:00-11:50 am, McKenzie 125 (capacity: 80) CRN: 22559 Credits: 4
Final Exam: 8:00 am, Thursday, March 22, 2012 (no student may take the final prior to its scheduled time, so plan any spring break travel accordingly)
Grading options: graded for Majors; optional for all other students

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Brief Course Description:

Considerations for the design of environmental and natural resources policies and regulations: balancing society’s preferences and the costs of environmental protection and resource conservation.

Expanded Course Description:

Earth does not have enough resources to permit humans to have as much of everything as they might want. For better or worse, we are the dominant species; other species currently have standing only insofar as humans care about them. In this capacity, we must often make difficult choices about how the earth’s environmental and natural resources are managed. For example, forests can be preserved in their natural state, harvested selectively and sustainably, clear-cut, or turned into farms, housing developments or shopping malls. Lax pollution regulations can permit industry to prosper, allowing higher wages, lower consumer prices and bigger investment returns for people who are saving for their retirements, or pollution can be tightly controlled to improve human health outcomes and protect ecological systems and their services.

Different constituencies have different levels of desire for each of the range of possible management outcomes. The benefits or costs to individual humans under different management scenarios may be modest but widespread, or they may be large and concentrated among fewer people. The benefits may also accrue to very different groups of people than those who bear the costs. There are often benefits and costs from the way resources are managed that spill over onto third parties—who are not directly involved in the decisions that have been made and who therefore do not have any weight given to their preferences in these choices. Likewise, many resources belong to everyone but no one, and sustainable management is often fundamentally impossible without government intervention in the form of policies and regulations.
We will explore how environmental and natural resource management decisions are made. Given that we need to use at least some natural resources to survive, it is not possible to completely eliminate all mining, fishing, or logging. Likewise, it is not possible to reduce all forms of pollution to zero. But how much of each of these activities is too much? We will examine some pragmatic criteria and some evidence which can be used to help guide decision-makers who are responsible for setting policies and regulations. We will pay particular attention to circumstances when government intervention is essential because private incentives definitely cannot be relied upon to yield socially desirable outcomes.

Position of this course in the UO curriculum:

Environmental Studies majors sometimes have little prior exposure to the principles behind incentive-based strategies for environmental management via government policies and regulations. The academic discipline of economics concerns the allocation of scarce resources among competing uses. But many people with little or no exposure to the discipline tend to confuse economics with some of the behaviors that economists study. Environmentalists often do not distinguish between economists and the owners/managers of profit-maximizing corporations (who are perceived to ignore environmental damages because they only care about the “bottom line”). This is like rejecting the field of criminology because you are opposed to crime.

A basic familiarity with economics is crucial to an understanding of environmental and natural resource policies. However, introductory courses in economics rarely spend more than one or two lectures on applications to the environment or natural resources, and they are designed primarily to equip students with all of the analytical tools needed to continue in the economics major. While EC 333 (Resource and Environmental Economic Issues) is offered at least once each year at the University of Oregon, EC 333 has EC 201 (Introduction to Economic Analysis: Microeconomics) as a prerequisite, and it is taught at a more analytically rigorous level. This course (ENVS 335) is targeted specifically to ENVS majors and covers only the most-relevant material from EC 201 and a portion of the more-accessible material from EC 333, supplemented with policy-related readings and references to current events. This course is intended to function as “just enough economics” for the ENVS undergraduate major. It is not a substitute for EC 201.

Necessary skills:

The course will require no algebra and no calculus. However, it will be important to have a rudimentary understanding of simple graphs and how they can be used to describe how one thing depends on another. For a graph that shows the relationship between $y$ on the vertical axis and $x$ on the horizontal axis, participants will need to be comfortable with the idea that slope = rise/run = the change in $y$ for a one-unit change in $x$.

Textbooks/Readings:

There is no single textbook for this course, although we will draw two or more chapters from each of the following books. None of these books has been explicitly ordered as a text, although a course reader is being assembled which will include copies of the relevant sections (at a price which includes the legally necessary copyright clearance fees).


Links to readings not included in the course reader have been placed on Blackboard (Bb) under “Additional Readings” currently filed under Course Documents. These linked readings can also be accessed directly via UO’s digital subscriptions for the corresponding journals. Selected newspaper “clippings” on relevant current events will sometimes be archived (only for the duration of the course) on Blackboard. Relevant items for specific lecture topics will be drawn to your attention as we go along.

Required readings will be targeted to average roughly 60 pages per week of relatively straightforward prose. See the Student Engagement Inventory at the end of this syllabus.

**Tentative course outline, roughly by week:**

Topics may be substituted or supplemented according to student demand, at the discretion of the instructor.

1. [Lectures 1 and 2, January 10 and 12, 2012] A smattering of philosophy; idealism vs. pragmatism; humans as the dominant species (for better or worse); how can we measure what humans are willing to give up for improved or preserved environmental quality? What about natural human impatience and discounting the future? [Problem Set #1 will be handed out during the SECOND lecture on January 12 and will be due on THURSDAY, Jan. 19; 6 2/3 % of course grade]


2. [Lectures 3 and 4, January 17 and 19, 2012] How can we measure what humans would have to give up for improved or preserved environmental quality? Engineering costs versus other considerations; principles of welfare assessment; arguments for and against the use of formal benefit-cost analysis as an input to environmental decision-making; environmental regulation in practice in the U.S.; the safety standards, cost-effectiveness, efficiency [Problem Set #2 will be handed out on January 24 and will be due on TUESDAY, Jan. 31; 6 \( \frac{2}{3} \) % of course grade]


g. OPTIONAL: U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, December 17, 2010. {This is a huge document, 272 pages; for now, just browse the Table of Contents, p. i-v, to understand scope of benefit-cost analyses} [5 pages Bb]
assessment differs from impact assessment. [Material up to the end of the lecture and readings for January 26 will be eligible for inclusion on the first Midterm, which will be on Thursday, February 2]


d. OPTIONAL: Hanley, Nick, Robert E. Wright, and Vic Adamowicz (1998) “Using Choice Experiments to Value the Environment,” Environmental and Resource Economics 11, p. 413-428. [15 pages Bb] {an early example; don’t worry about the math…read around it if necessary}


h. OPTIONAL: (Public understanding) Fiona Harvey, “UK green spaces worth at least 30 billion pounds a year in health and welfare, report finds,” The Guardian, 2 June 2011. (including public commentary on this article) [2 page article, many pages of public comments, Bb]


4. [Lectures 7 and 8, January 31 and February 2, 2012] Valuation of human health risks. What costs are we willing to incur due to regulations designed to reduce risks to human life and health? Hazard pay for dangerous jobs, expenditures to avoid or avert health effects, survey methods; differences by type of risk and characteristics of the affected population; why life insurance and health insurance premiums don’t tell us what we need to know. Midterm 1 (February 2, starting at 10:00 am sharp; 20% of course grade) –
1 hour long (rather than a full class period), covering material to end of the lecture on January 26 (lecture 6); exam will take first half of the lecture period.

d. Cameron, Trudy Ann (2010) “Euthanizing the Value of a Statistical Life,” Review of Environmental Economics and Policy 4(2), 161-178. {A case for changing the misleading terminology used by economists} Browse the supplementary material (quotes) associated with this article [18 pages Bb].

5. [Lectures 9 and 10, February 7 and 9, 2012] Managing pollution: external costs; legal rights and the potential for negotiated solutions; liability; why compensatory damages in natural resources lawsuits don’t necessarily tell us what we need to know; getting the most “bang for the buck” in efforts to clean up the environment; command-and-control methods, green taxes (and the potential for a double dividend). [Problem Set #3 will be handed out on February 9 and will be due on Feb. 16; 6 2/3 % of course grade]


6. [Lectures 11 and 12, February 14 and 16, 2012] Managing stationary sources of pollution; tradable permits (e.g. cap-and-trade), emissions permits versus ambient permits; emission reduction credits; the sulfur allowance program to control acid rain; the RECLAIM program in Los Angeles; carbon trading. [Material up to the end of the lecture and readings for February 16 will be eligible for inclusion on the first Midterm, which will be on Thursday, February 23]


d. OPTIONAL: Stavins climate policy blog: http://belfercenter.ksg.harvard.edu/analysis/stavins/ 


7. [Lectures 13 and 14, February 21 and 23, 2012] Managing mobile sources of pollution; why vehicle-miles travelled tend to be greater than socially optimal; CAFE standards; fuel economy versus safety arguments; emissions standards; MTBE, ethanol, biofuels and unintended consequences. **Midterm 2 (February 23 starting at 10:00 am sharp; 20% of course grade)** – 1 hour long (rather than a full class period), Covering material to end of the lecture on February 16 (lecture 12); exam will take first half of the lecture period.


d. OPTIONAL: (example of a CGE model) Schneider, Uwe and Bruce A. McCarl (2003) “Economic Potential of Biomass Based Fuels for Greenhouse Gas Emission Mitigation,” *Environmental and Resource Economics* 24, 291-312. {use of a computable general equilibrium model—read for the factors which are considered, not the details of the model; focus on sections 1-3, and beginning of section4.} [22 pages Bb]


8. [Lectures 15 and 16, February 28 and March 1, 2012] Managing exhaustible resources; incentives for management of privately owned mines or wells and for mining or drilling operations on public lands; property rights and the fact that extracting and using a ton of
ore (drum of oil) now means it won’t be there later when you might need it more; the rationale for royalty payments, stumpage charges. [Problem Set #4 will be handed out on February 28 and will be due on March 6; 6 2/3 % of course grade]


9. [Lectures 17 and 18, March 6 and 8, 2012] Managing renewable but depletable resources which are spatially fixed; commercial exploitation of forests; slash-and-burn; silviculture and forests as crops; multiple-use management and non-timber values of forests


10. [Lectures 19 and 20, March 13 and 15, 2012] Managing renewable but depletable and often open-access resources: commercial and recreational fisheries; wild fisheries, mariculture and aquaculture; maximum sustained yield versus efficient management versus free-for-all exploitation; high-grading, by-catch, costly enforcement; gear restrictions, taxes on fishing effort, individual transferable quotas (ITQs), individual transferable share quotas (ITSQs);

   Environmental equity from an economic perspective (overview; distributional consequences of environmental regulations).


g. **OPTIONAL**: [National Ocean Economics Program](#) non-market values inventory [website, Bb]


**Final Exam (8:00 am, Thursday, March 22, 2012; 40% of course grade)** – 2 hours long; Primarily material from lectures 13 to 20, but some earlier material.

**Requirements and Grading:**

- Best 3 of 4 homework sets @ 6 2/3 % = 20%
- Two in-class midterms @ 20% = 40%
- Final exam = 40%

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100%

Homeworks must be turned in when they are due. In lieu of make-ups for missed assignments, we will automatically drop your single lowest score, which may include zeros for missing or late assignments.

Classroom exams are closed-book. It may take us up to one week to complete the grading process. Exams must be written as scheduled. There will be no make-up midterm exams; with a legitimate documented excuse, scores on the other course requirements will be reweighted. No one may write an exam prior to its scheduled time. Please plan accordingly for any travel over the quarter break. As noted above, our final exam is 8:00 am on the Thursday of exam week in the Winter quarter of 2012.

In a sufficiently large introductory class at the 300 level where students display a typical distribution of effort levels, I generally expect to give roughly 60% A’s and B’s. I reserve the grade of A+ for distinctly exceptional performance relative to the rest of the class and I have
rarely given more than one or two such grades in any class, regardless of size. Unfortunately, a few students typically earn rather low grades, too, in some cases because they underestimate the amount of attention the course requires. As an economist, however, I am entirely sympathetic that students have many different demands on their time, and different priorities for this class relative to their other coursework. To a certain extent, I view course grades as reflective of the amount of time and effort that students have decided to devote to the course, in whatever manner is optimal for them personally. Remember that help is available during office hours or by appointment with either the GTF or the professor.

My grading rubric is generally as follows:

A = shows strong understanding of almost all of the big ideas introduced in the course (although these students might not have picked up on every one of the more esoteric points)

B = shows good understanding of a majority of the biggest ideas in the course, but may display some gaps in understanding for a few of them

C = shows good understanding of some ideas, but reveals a worrisome cause for concern about their understanding of other ideas

F = relatively little evidence that enrollment in the course has produced much value-added in terms of the student’s understanding of the issues; inability to invoke the ideas introduced in the course in the relevant contexts.

**Student Engagement Inventory**

It comes as a surprise to some students, but at UO, “student engagement” hours must total 120 hours per term for a 4-credit course. This means that for the median UO student, there is an expectation that to succeed in a 4-credit course, you should be able to devote an average of 12 hours per week to the material. That is 8 hours each week outside of your attendance at lectures. (Remember that only 50% of UO students are above the median, by definition.)

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<thead>
<tr>
<th>Activity</th>
<th>Elaboration</th>
<th>Expected Hours</th>
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<tbody>
<tr>
<td>Course attendance</td>
<td>Verified periodically (i.e. when exams and/or homework sets are not collected during lectures on days when they are returned)</td>
<td>40 hours (4 hours per week)</td>
</tr>
<tr>
<td>Assigned readings</td>
<td>Course reader (selected book chapters), Blackboard-archived journal articles; news items; supplementary instructor notes</td>
<td>60 hours (6 hours per week)</td>
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<tr>
<td>Homework sets</td>
<td>Mixed formats: short answers (up to a couple of paragraphs, relevant diagrams), occasionally use non-trivial multiple choice questions to conserve on grading hours</td>
<td>20 hours (5 hours for each of four assignments)</td>
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