The study of environmental economics is interesting, thought-provoking, and controversial. This is both a strength and a weakness; the strength is that the inherently interesting nature of the subject matter results in greater student interest and involvement than might be the case for many of the other fields in economics. The weakness, however, is that the emotionally-charged nature of the topic tends to lead to fuzzy thinking--indeed, there is ample evidence that this problem is not unique to the academic setting; many of the worst examples of government spending and legislation have stemmed from perceptions of a "crisis," whether it is an energy crisis, a defense crisis, a health-care crisis, or whatever.

As you will see, the economist views environmental problems, like most other problems, as being "resource-allocation problems" (that is, are we allocating our scarce resources in such a way as to get the best combination of environmental goods and ordinary goods that we value). Another way to express this is that economists deal with choices. If a problem is not viewed as being a matter of choice, then it is a non-economic problem. The preceding three sentences are far more important--and controversial to many environmental studies majors!--than they might seem at this point...you might wish to read them again. To make a simple analogy, suppose you believe (for religious or other moral reasons) that it is wrong to have sex prior to marriage--for you this is not "a matter of choice;" it is not "something to decide upon." Economists also have various beliefs, but in their role as an economist, such issues are viewed as choices, something to decide about--to decide about on the basis of benefits and costs (note, these benefits and costs need not involve dollars!). Depending on our individual beliefs, the costs may be high relative to benefits, or they may be low. If, however, costs are higher than benefits, and we abstain from pre-marital sex, we are doing so--from the economist's perspective--as a matter of choice (informed by our moral and other beliefs). But, while the observed behavior might look similar, this is quite different from arguing that there is no choice for such decisions. A perhaps more pertinent example: some of you recycle as much as you can because you believe it is the "right" thing to do, independently of personal costs and benefits; others of you hardly recycle at all feeling that the costs are greater than the benefits. This seemingly simple point, combined with relentless brainwashing in favor of "the environment" beginning--these days--in grade school, will appear over-and-over throughout the course and makes environmental economics difficult to understand or enjoy for some students. However, I'll do what I can to make it enjoyable!

We begin with the application of basic economic and philosophical concepts to an understanding of the environment. This is followed by a relatively brief overview of environmental quality, of the major pollutants, and of how both are characterized. This is to give us a common environmental background. We then turn to an in-depth treatment of how an understanding of economics can usefully guide the analysis of environmental quality, subject to some philosophical issues already hinted at. With this as background, it is possible to turn to a consideration of appropriate environmental policy. The focus is on applications vital to a voting citizenry and to those going on to work in any area of the environment. My ultimate goal for each of you is to have you better understand (if not agree with!) how environmental problems are perceived by decision-makers in the "real world," hence better understand the policy approaches--good and bad--by those decisionmakers.

Texts:

There is considerable difficulty in finding an appropriate text for this course--the reasons are many: 1) most "environmental" textbooks have too little economic content to be useful, 2) most "economic" texts have as prerequisites more economic theory than is required for this course, and 3) many books are overly mathematical for the more policy-oriented approach that I wish to pursue. We will not, then, have a book for this course. As a consequence, class attendance will be quite important, far moreso than is usual at C.U. In large part, this is because I prefer an organization of the material that is not yet available in textbook form. I will be posting handouts to my website that will provide a detailed guide to lectures for the course. Getting notes, if you must miss a class is still likely to be quite helpful, since the concepts in the handouts will be illustrated with numerous examples during class discussion. All notes are not created equal--if you must miss, get somebody's notes who is a good note-taker.

Administrative Matters:

There will be one midterm (35%) and the final (50%) and a "number-based" paper (to be discussed more fully in
class and a handout) that will comprise the remaining 15% of the grade. The length of the paper is not critical, but think in terms of 5 pages--it will be more fun for both of us if you pick a topic that you are particularly interested in.

The test format, a mixture of subjective (short-answer, space constrained, essays) and objective ("shotgun" T-F questions) questions, will be discussed more fully in class and there are samples on the website.

Office: Economics 223 (Northwest corner, 2nd floor of the Economics Bldg)  
Hours: TR 2:00-3:00 (and by appointment).  
Phone: 492-7021 (message machine-but not in on a daily basis)  
e-mail: gravesp@spot.colorado.edu (e-mail definitely preferred route of communication--I'm online daily and at odd hours)

Approximate Course Outline:

Week Topic

1,2 Overview and Introduction (The Market and When It Fails to Give Us What We Want):  
Doomsters vs. Boomsters and the natural resources and environmental implications; Logical matters of rationality; ordinary goods and environmental goods; efficiency versus equity (yachts and E.Q.); MSB=D? MSC=S?; Use of $'s; "Values" (what the market does and broader issues of whether human marginal willingness-to-pay is "appropriate" even without external costs or benefits); externalities; public goods (new material here, not yet in any book!); the role of property rights and enforcement (endangered species, but also air, etc). The "missing market."

3 An Environmental Background (Local Environmental Problems):  
Discharges and environmental quality; air (TSP, SO, HC, CO, NO Lead & the major polluters); water (BOD, DO, fecal colliform, pH, solids, hardness, conductivity, turbidity, salinity & the major polluters); other (hazardous substances, sources).

4 Overview of an Interdisciplinary Approach to Environmental Analysis (5-Box Diagram)  
Costs of policy and impact on emissions; dispersion; benefits of policy (damage reduction); spatial adaptations in policy; incidence of policy (who is helped and hurt?).

5,6 The Economic Theory of Environmental Quality  
The consumer optimum (excess pollution in the uncontrolled case, due to externalities); the firm optimum (excess pollution in the uncontrolled case, due to externalities); the law of conservation of matter and energy and the summation of individual emissions into the environmental quality we all consume; "social welfare functions" and implications in the environmental setting.

7 Interdisciplinary Approach (Boxes 1 & 2)  
Policy costs (add-on devices, input substitutions, spatial and temporal modifications, and input/output bans; higher costs or reduced quantities of other goods ultimately-- TANSTAAFL, but some "no regrets" policies) and the impact on discharges; going from discharges to environmental quality.

8 Interdisciplinary Approach (Box 3)  
Three approaches to benefit estimation: 1) referenda, 2) survey/experimental, and 3) use of known relations between environmental and other goods). Sub-approaches of the last: 3a) sum of specific damages, 3b) hedonic approaches, 3c) travel cost; philosophical issues again--the "statistical value of life" (review "values" and preferences over values).

9 Interdisciplinary Approach (Boxes 4 & 5)  
The spatial dimension in environmental policy; local, regional and global damages. What are the equity implications of environmental policy as practiced in the U.S.? Why the poor pay a higher percentage of income in environmental cost and why the poor receive lower environmental benefits as a percentage of income (i.e. env policy is regressive)

(Midterm about here--midterm date is a "public good"--voting?)

10,11 Benefit-Cost Analysis (certainty and uncertainty)  
government failure; Ben Franklin quote; consumer and producer surplus; four approaches to project evaluation (and why "net present value" is to be preferred); B&C as S&D in disguise. Multi-attribute analysis. The rationality of discounting and the appropriate choice of discount rate.
12 The Coase Theorem
Why there are not more environmental problems than there are--the Coase theorem; applications to the steel plant/laundry, to the reserve clause of baseball, and to water allocation.

13 International Trade and Environmental and Human Rights Concerns
Benefits from trade, in terms of wealth gains, for all countries. Relationships between wealth and demand for environmental quality and labor standards. History of U.S. Temporary problems. Potential for more of everything, including environmental quality. Controversial material that is very poorly understood by non-economists (and even some economists!).

14 An Ecological Doomsday Model
An ecosystem: rabbits and foxes (simultaneous equations); An ecological background; The biologist/environmentalist versus the economist: notions of assimilative capacity, environmental damages may be "optimal" (i.e. externalities can be internalized, but with remaining environmental damage), and the "downward spiral" of ever-worsening condition of both the economic and environmental systems! Relevance of the model and possible offsets.

15 Policy Analysis--What Does Economic Theory Suggest?
Criteria for evaluation of policy; Coase and moral suasion (decentralized approaches); Command-and-control strategies (standards, required equipment); Incentive-based approaches (taxes, subsidies, salable emission rights (handout))

16 Actual U.S. Policy
Water pollution control policies; Air pollution control policies; Toxic and Hazardous substance policy; miscellaneous related issues

17 Miscellaneous Topics
International environmental responsibility (foreign, alternative economic system, global); baby certificates and pollution permits; the carrying capacity of a wilderness area; fisheries economics and rain forest issues

18 Epilog--Do You Expect The Future To Be "Better"?
Alternative views of the future. Population and income growth--are they good or bad? The "boomsters" versus the "doomsters"--and the Simon/Ehrlich bet; intergenerational equity; summary and review

(Final Exam, Monday May 6, 10:30am-1:00pm in class--Good Luck!)