PLCY 480 / ENST 480 Environmental Decision-Making (3)

Spring 2008 MW 3:30-4:45 301 Greenlaw

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Environmental policy issues are not only about natural processes and trends, but about the impacts on them of human decisions and behavior patterns. From global warming and the stratospheric ozone hole to tropical deforestation, over-fishing, air and water pollution and urban sprawl and other issues, unsustainable or damaging uses of the environment result from human behavior: as individual consumers and citizens, as employees or managers in businesses and other organizations, as legislators and government administrators, and as representatives of countries negotiating international agreements, among other roles.

This course has two primary objectives. The first is to examine the factors affecting environmental decision-making by individuals, businesses, governments, and international institutions, and the theories and evidence available for understanding and explaining their behavior. The second is to identify the implications of these considerations for designing public policies and action strategies to promote more environmentally sustainable outcomes. The basis for this inquiry will be a combination of readings, cases, and guest presentations by environmental decision-makers. The course expectations are designed particularly to serve students majoring in public policy, environmental studies, environmental sciences, and related fields; other students interested in engaging the subject matter at that level are also welcome.

There are many more kinds of environmental decisions than can be discussed in depth in a single semester. For this course, we will focus particularly on human behavior related to the causes and consequences of global environmental change, and especially global climate change. We will discuss three broad types of environmental decisions: decisions by individuals, by businesses, and by governments. For each of these types of decision makers, we will discuss one to several examples. For each of these examples, we will typically discuss background readings and theories of decision-making, and one or more case studies, including discussion of public policy options for promoting behavior and decision-making that is better for the environment. In your papers, you will also have the opportunity to explore examples of environmental decision-making on your own and in greater depth.

Course requirements

The specific requirements of the course include required readings for each class session; active participation in class discussions; several papers and presentations, and a final examination.

Readings: Most required readings can be downloaded from E-reserves on UNC Library's web site, or from the course web site on Blackboard, or found directly on Internet links. This procedure will save you the cost of buying a course pack (including particularly the additional cost of course-pack copyright royalties, which UNC covers for e-reserves). Additional course materials and announcements will be posted on UNC's Blackboard course support web site (http://blackboard.unc.edu). **Please start by going to this site immediately and downloading an electronic copy of the course syllabus.** This will allow you to access many readings directly from hotlinks in the syllabus.

Class discussions: Class discussion is an important core element of the course, designed to examine theories about human behavior and decision-making and then to apply them to environmental issues. Please be sure to do the readings ahead of each class for which they are assigned, and come prepared to participate actively in class discussions. From time to time we will also use smaller group and team discussions.

Team problems and presentations: At the end of the section of the course on business decision-making, we will use team processes to develop background information and brainstorm possible ways of improving business decision-making affecting the environment in a range of sectors and types of businesses. As a team member, each student is expected to contribute actively to the team's success in developing background information, brainstorming possible solutions, and preparing a class presentation on possible strategies to influence more environmentally sustainable decisions related to the assigned issue. Each team will have a maximum of 10 minutes to present its ideas, followed by up to 10 minutes of class discussion. You are encouraged to use your combined efforts to find out enough about the individual issue to make plausible recommendations, while recognizing that this is not a fully developed research project. This will probably require at least two team meetings outside of class, with individual work effort in between them, so be sure to get together and arrange these well ahead of time.

Written assignments. There will be one short paper due early in the term comparing arguments for different approaches to global climate change. There will also be two additional papers, due at the end of the sections of the course on individual decision making and on government decision making. At the end of each of these segments of the course, each student will be expected to submit a 5-8 page paper (longer is allowed if you wish to) representing your best ideas on the most promising strategies for improving environmental decision-making and behavior in each of these contexts.

In each paper, you are encouraged to apply what you have learned from the readings and class discussions, as well as your own research on the issue and on decision-making by the relevant type of decision-makers, to show how it can be used to improve

these sorts of decisions. Be sure to use proper practices for citing and identifying all reference materials used (see handout on these practices on the Blackboard site).

Examinations: There will be a final examination, which will be based on the readings and related class discussions, but no midterm.

Grades: Grades will be calculated as follows: 10% first paper, 20% second paper, 20% group presentation, 20% final paper, 10% class participation, 20% final exam.

Documenting source materials and avoiding plagiarism: It is very important that you develop good habits of documenting the sources both of factual statements and of the ideas, opinions, and arguments of other people that you use in any paper you write.

One basic reason for this is to be able to support the statements you make and the facts you use, both for your own future use and if anyone else should question or disagree with them. A second reason is to distinguish clearly between someone else's ideas and arguments and your own, and not confuse the two. And a third is to protect your own integrity against either deliberate or accidental representation of someone else's ideas or work as your own, which if intentional is known as plagiarism and is a serious violation of the UNC Honor Code and of the standards of ethical writing.

Please read the handout on the Blackboard site for more detailed suggestions on this subject. For additional detail on proper citation and appropriate use of other authors' materials, see http://www.unc.edu/depts/wcweb/handouts/plagiarism.html. For handouts on other good writing practices, http://www.unc.edu/depts/wcweb/handouts/.

CLASS SCHEDULE AND READINGS

I. Introduction: Environmental change, human behavior, and public policy

January 9 Introduction
January 14 Global environmental change
January 16 Environmental issues as problems of behavior and decision-making
January 21 No class *(MLK Birthday)*
January 23 Private versus collective decisions: FISHBANKS simulation
January 28 Markets and governance: why government, why public policies

II. Climate change: proposed solutions

January 30 Government actions: policy "tools," impacts, successes and failures
February 4 Climate change solutions: Current policy proposals
February 6 Climate change solutions: market-oriented proposals
February 11 First paper due.
February 11 Guest speaker: Dr. Amory Lovins *(founding director, Rocky Mt. Institute)*

III. Negotiating international climate agreements

February 13 International environmental decisions. Case: negotiating a global climate change agreement (multi-country simulation: intro and first round)
February 18 Negotiating a global climate change agreement (continued) **(NOTE: this class runs till between 8:00 and 9:00, last hour is important for debriefing)**
February 20 Lessons from global climate change example (game debrief continued, and presentation on current state of actual climate negotiations).

IV. Environmental Decisions by Individuals: Consumers, Households

February 25 Introduction: How and why do individuals make environmental decisions?
February 27 Influencing values and attitudes / personal transportation choices
March 3 Changing information, beliefs, and education / consumer choices
March 5 Changing incentives / household energy use
March 10, 12 No class *(Spring Break)*
March 17 Second paper due.

V. Environmental Decisions By Businesses

March 17 Introduction: How and why do businesses make environmental decisions?
March 19 Why are some businesses "green" (but not others)?
March 24 Influencing environmental decision-making by businesses
March 26 Case: Green buildings and the development and construction industries
March 31 **Presentations due**: Influencing businesses' decisions (1st 3 teams)
April 2 **Presentations due**: Influencing businesses' decisions (remaining teams)

VI. Environmental Decision-Making by Governments

April 7 Introduction: environmental decision-making by legislatures
April 9 Climate change decisions and behavior in North Carolina
April 14 Case: energy and climate change legislation in North Carolina, and the NC Legislative Study Commission on Climate Change.
April 16 Decision-making by government operating enterprises / UNC
April 21 Decision-making by local governments / Chapel Hill
April 23 Last class: final discussion, **fourth paper due**
May 2 **FINAL EXAM: Take-home due Friday, May 2, 4:00 p.m. (same time as scheduled exam period for this class)**

CLASS SCHEDULE AND READINGS

I. Introduction: Environmental change, human behavior, and public policy

January 9 Introduction

- Self-introductions
- Introduction to syllabus: course objectives, expectations, logistics; Q&A
- Discussion questions: What do we know, or think we know, about global environmental changes that are currently occurring? about climate change in particular? What are believed to be the magnitude and timing of these changes?

What are their anticipated consequences?

What are the apparent *causes* of these changes? To what extent are they caused by *human behavior* or *human decision-making*? Whose behavior, and who makes the decisions – individuals, organizations, governments? social or cultural norms and expectations?

What should be done about them, if anything? Should we try to mitigate (that is, reduce the extent of) these changes, or merely try to adapt to them? Should we leave these responses up to individuals, and to economic markets, or should governments also respond with *public policy* changes – and why or why not? What can governments do about them that individuals or other organizations can't? Is government a solution or just another cause of the problems?

January 14 Global environmental change *(guest: Dr. Douglas Crawford-Brown)*

Read the IPCC *Summary for Policymakers* report and other readings assigned below. To the extent that you have time and interest, also bring to class examples of any different or opposing points of view on these predictions that you find on the internet that you consider credible enough to deserve consideration.

- Discussion questions: What are the most important trends and other changes in climate and other environmental conditions that are currently taking place at a global scale? How do we know, and with what level of likelihood? What are the possible consequences, how likely are they to occur, and over what time scale?

How should governments (and businesses, and consumers and citizens) approach issues such as climate change involving long-term, large-scale, but uncertain consequences?

How should they decide among actions to *mitigate* global warming, to *adapt* to it, or some combination of the two?

Woods Hole Research Center. (n.d.). *The Warming of the Earth: A beginner's guide to understanding the issue of global warming*. On line (accessed 1/4/08) at http://www.whrc.org/resources/online_publications/warming_earth/

Intergovernmental Panel on Climate Change. 2007. *Fourth Assessment Report: Climate Change 2007: Synthesis Report, Summary for Policymakers*. On line at

http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (accessed December 28, 2007)

Millennium Ecosystem Assessment. 2005. *Ecosystems and Human Well-Being: Opportunities and Challenges for Business and Industry*. On line at http://wdc.nbii.gov/ma/EcosystemsAndHumanWellbeing_Opportunities%20and%20Challenges%20for%20Business%20and%20Industry.pdf (accessed December 28, 2007).

(Optional) Stern, Nicholas. Executive Summary. *The Economics of Climate Change* ["Stern Review"]. *(Sir Nicholas Stern is Head of the British Government Economic Service and adviser to it on the economics of climate change)*. http://www.hm-treasury.gov.uk/media/4/3/Executive_Summary.pdf

(Optional, for more detailed background information) Pew Center on Global Climate Change. (n.d.). *Climate Change 101: Overview.* http://www.pewclimate.org/docUploads/1114_OverviewFinal.pdf

January 16 Environmental issues as problems of behavior and decision-making

In what ways are environmental changes such as those we discussed last time influenced by *human decisions* and *behavior*? by individuals, by businesses, by governments, and/or by other organizations?

Why do people do things that cause these impacts, and why do they keep doing these things even in spite of the impacts?

Given these possible reasons, how might one go about trying to *change* patterns of behavior that cause serious environmental damage? What kinds of public policies or other actions might be most likely to influence these patterns for the better?

Case study: energy use. Energy production and use is a major source of environmental damage throughout the modern world, including air pollution from fossil fuel combustion and petroleum refining, global warming due to emissions of greenhouse gases, and water pollution from energy resource extraction and transport, among others.

Read the Gardner/Stern chapter below, and come prepared to discuss which behaviors and intervention points might be most important and effective for reducing environmental damage from energy production and use, and what strategies one might then try to design to do so at each of these points.

Gardner, Gerald, and Paul Stern. 2002. Choosing the Behaviors to Change and the Points to Intervene. Chapter 10 in their *Environmental Problems and Human Behavior* (Boston, MA: Pearson Custom Publishing, 2002, 2nd ed.), pp. 253-76.

January 23 Private versus collective decisions

Case study: FISHBANKS (team simulation). Teams to be assigned, and handouts to be distributed.

January 28 Markets and governance: why government, why public policies

Discussion of lessons from FISHBANKS simulation, and implications for markets, governance, and governments.

How can we solve situations in which the collective consequences of individually rational decisions result in environmentally destructive outcomes? What are the key elements of Garrett Hardin's argument about the circumstances under which "tragedies of the commons" happen? Think of other examples in addition to pastures and fisheries. What does Feeny's article teach us about the range of possible solutions to tragedies of the commons?

What environmental problems do not fit this model (think of examples)?

When and why should governments attempt to solve environmental problems and to influence environmental decisions?

Hardin, Garrett. 1968. The Tragedy of the Commons. *Science* 162:1243-48. http://www.flsuspop.org/docs/TheTragedyoftheCommons.htm (or e-reserve).

Feeny, D.; Berkes, F.; McCay, B.; and J. Acheson. 1990. The Tragedy of the Commons: Twenty-Two Years Later. *Human Ecology* 18(1):1-19.

Andrews, Richard N. L. 1999. Environment and Governance. From Chapter 1 in his *Managing the Environment, Managing Ourselves* (New Haven: Yale University Press), pp. 1-10.

January 30 Government actions: policy "tools," impacts, successes and failures

If it is true that at least some environmental problems require action by governments, what public policy *tools* can governments use to try to influence environmental decisions? Make a list of the main types of environmental policy tools Gunningham and Grabosky discuss, then add to it any other kinds of actions you can think of that governments might use to try to solve environmental problems. Finally, for each of these tools list what you imagine might be its greatest strengths and weaknesses *(ungraded assignment -- be prepared to turn this in)*.

Gunningham, Neil, and Peter Grabosky. 1998. Instruments for Environmental Protection. Chapter 2 in their *Smart Regulation: Designing Environmental Policy*. New York: Oxford/Clarendon Press, pp. 37-91. (This is a long but very useful reading. For this initial session, *skim* this chapter for an understanding of the main *kinds* of actions governments can take to influence environmental behavior – and think of other kinds of actions not mentioned here as well. As we move through the semester, you may want to come back to sections of this reading for more detailed consideration of the strengths and limitations of each of these kinds of

"policy instruments" that governments can use – and environmental advocates can propose – to try to influence environmental decisions).

[January 31 "Focus the Nation" campus events: Student Union Great Hall, all day]

II. Climate change: proposed solutions

(NOTE: Paper due February 11: start thinking about it now!)

First paper: due February 11

The Resources for the Future papers you will read for February 4 all support the development of policies to promote behavior changes for reducing global climate change, but also argue that these changes will be very costly. Lovins, in contrast, argues that these changes would make economic sense and even be profitable for businesses if we simply remove existing market failures and other barriers to these changes. **In a paper of about five pages' length, summarize and critically compare these two positions.** What do you see as the strengths and weaknesses of each? On what points do they agree and disagree? Where they disagree, which arguments do you find more persuasive? Why?

February 4 Climate change solutions: current policy proposals

Read the materials below on current U.S. policy proposals for mitigating global warming. What are the main similarities and differences in them, and what do you think are the most significant decision issues among them? Why?

What would be good criteria for choosing among them or refining them further? What are the costs of each, and what do you (and the authors) count as costs? What benefits? Who gets the benefits, and who pays the costs?

Arimura, Toshi H.; Dallas Burtraw, Alan Krupnick, and Karen Palmer. 2007. U.S. Climate policy developments. Discussion Paper 07-45, Resources for the Future. On line at http://www.rff.org/rff/Documents/RFF-DP-07-45.pdf

Resources for the Future. 2007. Summary comparison of Climate Change Bills in Congress as of October 31, 2007. On line at http://www.rff.org/rff/News/Releases/2007Releases/Nov2007ClimateChangeBillsinCongress.cfm

Aldy, Joseph E. 2007. Assessing the Costs of Domestic Regulatory Proposals. Weathervane Backgrounder, Resources for the Future. On line at http://www.weathervane.rff.org/Backgrounders/RFF-BCK-AssessingtheCosts.pdf

Pizer, William A. 2007. The State of Climate Change in 2007: Findings of the Fourth Assessment Report by the Intergovernmental Panel on Climate Change,

Working Group Three: Mitigation of Climate Change. Testimony prepared for the U.S. House of Representatives Committee on Science and Technology. On line at http://www.rff.org/rff/News/Releases/2007Releases/PizerTestimonyMay07.cfm

(Optional, for additional background information)
http://www.rff.org/rff/Publications/CPF_AssessingUSClimatePolicyOptions.cfm

February 6 Proposed solutions: another perspective

Read the materials below by Amory Lovins, founder of the Rocky Mountain Institute, whom we will hear from and question in person on February 11, and the recent report by McKinsey & Co. How are these proposed solutions similar to and different from those we read for the previous class? Why? How do they treat the concepts of costs and benefits? What are the strengths and the weaknesses in their arguments? Can both they and the previous authors be right? If not, which do you find more persuasive? why?

Lovins, Amory. 1997. *Climate: Making Sense and Making Money*, pp. 1-26. On line at http://www.rmi.org/images/other/Climate/C97-13_ClimateMSMM.pdf (accessed January 6, 2007). For Powerpoint summary version see also http://www.rmi.org/images/PDFs/Climate/C97-15_RMIKyotoClimate.pdf

Wald, Matthew. 2007. Study Details How U.S. Could Cut 28% of Greenhouse Gases. *New York Times*, November 30, 2007.

McKinsey & Company. 2007. Executive summary. *Reducing U.S. Greenhouse Gas Emissions: How Much and at What Cost?* On line (accessed January 5, 2007) at http://www.mckinsey.com/clientservice/ccsi/pdf/Greenhouse_Gas_Emissions_Executive_Summary.pdf

*(Optional, additional work by Lovins)*http://www.RMI.org, http://www.oilendgame.com

February 11 First paper due.

February 11 Guest speaker: Dr. Amory Lovins *(founding director, Rocky Mountain Institute)* **[NOTE: Today's class will meet in Toy Lounge, 409 Dey Hall.]**

III. Negotiating international climate agreements

February 13 International environmental decisions. Case: negotiating a global climate change agreement (multi-country simulation: intro and first round)

Read the selections by Hempel, Evans and the Pew Center assigned below. How are *international* environmental agreements negotiated, and how do these negotiation practices influence the ways in which government negotiators make decisions affecting the environment? How do each country's *domestic* politics and political processes influence the negotiation of *international* environmental agreements?

What are the particular challenges associated with negotiating a multilateral agreement on limiting human causes of excessive global climate warming?

NOTE: We will also use part of this session to prepare for and begin the simulation of a climate change negotiation which we will complete during the next session.

Hempel, Lamont. 1996. The Environmental Policy-Making Process. Chapter 5 in his *Environmental Governance: The Global Challenge*. Washington, DC: Island Press, pp. 121-149.

Evans, Alex, and David Steven. 2007. Climate change: the state of the debate. Center on International Cooperation, New York University. Read Sec. 1, pp. 1-15 http://www.cic.nyu.edu/internationalsecurity/docs/LondonAccordclimatepaper.pdf

Pew Center 2007. Summary of Bali COP 13 climate treaty meetings. http://www.pewclimate.org/docUploads/Pew%20Center_COP%2013%20Summary.pdf

February 18 Negotiating a global climate change agreement (continued) **(NOTE: class runs till between 8:00 and 9:00, last hour important for debriefing.** *Guest facilitator: Dr. Mort Webster, climate change expert, MIT)***)**

Case: Negotiation of a Global Climate Change Agreement (role-play simulation). NOTE: Due to the time requirements of this multi-party negotiation process, this session will run until mid-evening, but no later than 9:00 p.m., and the final hour (debriefing) is particularly important. (pizza and drinks will be provided). Please note this on your calendars and save the time.

February 20 Lessons from global climate change example (game debrief continued, and presentation on current state of actual climate negotiations. *Guest: Dr. Mort Webster*)

Discussion: What were the main lessons you learned from this simulation? In what ways was this simulation similar to a real negotiation among nations, such as Jacoby describes the Kyoto Protocol negotiations? In what ways was it different?

What lessons does it suggest about environmental decision-making by governments, and especially by negotiations among governments?

Given these lessons, what do you see as the most promising strategies for achieving further reductions in human contributions to excessive global warming, and more generally, for achieving better environmental decisions by governments?

Wara, Michael. 2007. Is the Global Carbon Market Working? *Nature* 445:595-96

Evans, Alex. 2007. *The Post-Kyoto Bidding War: Bringing Developing Countries into the Fold*. Center on International Cooperation, New York University. http://www.cic.nyu.edu/internationalsecurity/docs/PostKyotobiddingwar.pdf

Pielke, Jr, Roger; Gwyn Prins; Steve Rayner; and Daniel Sarewitz. 2007. Lifting the taboo on adaptation. *Nature* 445:597-98.

IV. Environmental Decisions by Individuals: Consumers, Households

(NOTE: Paper due March 17: start thinking about it now!)

Second paper (due March 17)

Based on what you have will have read and learned about influencing individual environmental decisions, choose one type of individual or household decision-making or behavior that has significant impact on greenhouse gas emissions, and write a 5-8 page paper (longer if you wish) on how you would propose to influence individual consumer/household decisions to reduce their impacts on global climate change. Consider what kinds of changes would make the most difference, what the primary barriers are that need to be removed, and the most promising combination of policies and/or other initiatives to remove them including strategies to influence values and attitudes, information and beliefs, and/or incentives. (Examples might include e.g. home energy use, transportation, purchase of a home or motor vehicle or major appliance, ….)

February 25 Introduction: How and why do individuals make environmental decisions?

Read the articles by Ridley and Low, Stern, and Slovic et al.

What are the essential elements of Ridley and Low's argument about how people behave toward the environment, and about what kinds of strategies environmental advocates should use (and not use) to promote environmentally sustainable behavior? What are the strengths of their argument concerning rational self-interest versus altruism, and what are the possible criticisms of it? What strategies might be most successful in influencing the Kansas farmer/irrigators (in the Ridley/Low example) to conserve their use of groundwater – the example of the European irrigators? Appealing to their altruism, their self-interest, or something else?

How is Stern's behavioral characterization of environmental decision making similar to and different from Ridley and Low's approach? What implications do these similarities and differences have for understanding and trying to influence people's environmental decisions? For instance, how would you apply Stern's VBN and ABC concepts to the Kansas irrigators of Ridley and Low's example? What strategies might Stern propose would be most successful in influencing them to conserve their use of groundwater: changing their values, their information, or their incentives, or…?

Stern's theory argues (among other things) that motivations for pro-environmental behavior are based on perceptions of risk to environmental conditions that a person values. Slovic and his colleagues describe in greater detail how people characterize and act on such perceptions of risk. What are their main findings? What implications do these findings have for theories of "rational self-interest" as a basis for people's environmental decisions and behavior?

Finally, can you think of any examples of behavior to protect the environment that might be based on motivations other than a sense of risk or threat to environmental values? If yes, how might we amend Stern's and Slovic's perspectives to state a clearer theory of environmental behavior and decision-making?

What lessons do each of these readings offer for influencing individual behavior to mitigate and adapt to climate change? What additional ideas do they lead you to propose for dealing with this issue? Should we make a distinction between individuals' *consumer* behavior and their *political* behavior?

Ridley, Matt, and Bobbi Low. 1993. Can Selfishness Save the Environment? *The Atlantic Monthly*, September 1993, pp. 76-86.

Stern, Paul C. 2000. Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues* 56(3): 407-424.

Slovic, Paul; Fischoff, Baruch; and Sarah Lichtenstein. 1979 (April). Rating the Risks. *Environment* 21(3): 14-20, 36-39.

February 27 Influencing values and attitudes / personal transportation choices

How do people's values, attitudes and perspectives about the environment shape the decisions they make that affect the environment? Are moral and ethical values about how to treat the natural environment simply a special kind of individual preference, or something more?

How do people's values, attitudes, and perspectives about other things affect their decisions affecting the environment: for instance, about the rights of individuals, businesses, or governments to control the outcomes? About preservation of the status quo versus change: does change represent progress and improvement or risk and destruction? About material wealth and comfort versus nonmaterial values (community, spirituality, simplicity, …)? About their own roles as individual consumers or citizens, as members of families and communities, and as managers or employees? How do *your* values, attitudes, and perspectives on these sorts of issues affect your environmental decisions?

Cases: Personal transportation, voting decisions. The transportation sector – in particular, the combined effects of decisions and behavior on purchases of motor vehicles, fuels, driving behavior, and vehicle miles traveled (VMT) – is one of the major contributors to global warming, as well as to other problems such as urban air pollution and congestion.

If public values are changing in a pro-environmental direction, as Gardner & Stern suggest, how might we explain people's continued purchases of gas-guzzler motor vehicles and still rising VMT? And their continuing to vote for political representatives who are indifferent or even opposed to strong policies for greenhouse gas reduction and environmental protection?

In light of such behavioral outcomes, what can we say about people's environmental values, and about the effectiveness of trying to change them? Can you think of any more effective strategies for influencing people's values toward environmental protection and conservation? What are the key barriers to change?

Gardner, Gerald, and Paul Stern. 2002. Religious and Moral Approaches: Changing Values, Beliefs, and Worldviews. From Chapter 3 in their *Environmental Problems and Human Behavior* (Boston, MA: Pearson Custom Publishing, 2002, 2nd edition), pp. 59-70.

Public Opinion Strategies / Hart Research. 2005. Environmental values poll. Read pp. 1-22. http://www.nicholas.duke.edu/institute/surveywhitepaper.pdf

Banerjee, Neela. 2001. 'Made in America,' and Never Mind the Gas Mileage. *The New York Times*, November 23, 2001.

Fontanelle, Anthony. What Triggers SUV Purchase Decision? http://ezinearticles.com/?What-Triggers-SUV-Purchase-Decision?&id=498396

Wickell, Dale. (n.d.). 5 Reasons Why People Buy SUVs. http://trucks.about.com/cs/suvreviews/a/suv_5reasons.htm

Popely, Rick. 2006. Hardly pumped: Fuel economy ranks 26th with car shoppers—even in times of high gas prices. *Chicago Tribune*, November 19, 2006

Ohlemacher, Stephen. 2007. More commuters driving to work alone. Associated Press, Raleigh *News & Observer*, June 13, 2007

Smart Growth America. (n.d.). The Link to Energy Security and Climate Change. http://www.smartgrowthamerica.org/factsheets/climate.pdf

(optional) MPG International (for UNEP). 2004. *Sustainable Motivation: Attitudinal and Behavioral Drivers for Action*. (focuses on *consumer* attitudes toward environment). See esp. sections 5.1 (p. 12) and 6.0-6.7 (pp. 15-21). http://www.mpgintl.com/sustain/english/MPG_Intl_Sustainable_Motivation_Report.pdf

March 3 Changing information, beliefs, and education / consumer choices

What are the strengths and limitations of trying to change people's environmental behavior through educational and informational programs? Is it true that if we just educated people better and provided them with better information, they would

make environmentally responsible decisions? What do Gardner and Stern say? What else would have to be true for this strategy to work?

Case: "Eco-labeling" and "carbon footprint labeling" of products: There are quite a range of environmental product-information initiatives now in existence: consider for instance "dolphin-safe" labels on canned tuna fish, energy-use labels on appliances and gasoline mileage labeling on cars, recyclability and recycled-content labels, "organic" content labeling for foods and cosmetics, warning or hazard labels (toxic contents, genetically engineered foods), and "seal of approval" labels (Germany's Blue Angel, FSC forest products sustainable-management label, sustainably-harvested fish labels).

What lessons does experience with environmental labeling programs offer to help answer these questions? What lessons does Germany's Blue Angel eco-label program offer about the relationship between changing education and information, and changing people's environmental behavior?

Under what circumstances are eco-labels likely to be effective in producing more environmentally sustainable behavior by consumers? Would they work for other products that have major environmental impacts, such as cars? Houses? Fish? Others…?

Proposals have been made to label products for their "carbon footprint." How could these be designed to be an effective influence on consumer decisions and behavior?

Markets are also being created for individual consumers to purchase offsets for the carbon emissions associated with their decisions and behavior? How could these be designed to be an effective influence on consumer decisions and behavior?

Should carbon labels and individual offsets be mandatory?

Gardner, Gerald, and Paul Stern. 2002. Educational Interventions: Changing Attitudes and Providing Information. From Chapter 4 in their *Environmental Problems and Human Behavior* (Boston, MA: Pearson Custom Publishing, 2002, 2nd edition), pp. 71-94.

U.S. EPA. 2001. Information Disclosure Labeling Schemes. Pp. 164-72 in its *The United States Experience With Economic Incentives for Protecting the Environment*, Report No. EPA-240-R-01-001, January 2001. http://yosemite.epa.gov/ee/epa/eermfile.nsf/11f680ff78df42f585256b45007e6235/da1eb5228bd1257b852569e0007130c6/$FILE/EE-0216B-13.pdf

Müller, Edda. 2005. Environmental Labeling, Innovation, and the Toolbox of Environmental Policy: Lessons Learned from the German Blue Angel Program. Chapter 2 in *Environmental Policymaking: Assessing the Use of Alternative Policy Instruments*, edited by Michael T. Hatch (Albany, NY: SUNY Press), pp.17-44.

Murray, James. 2007. Tesco to introduce carbon footprint labels. http://www.computing.co.uk/business-green/news/2200892/tesco-introduce-carbon-labels

Rosen-Molina, Mike. 2007. Carbon Credit Report: Can buying carbon credits to offset the greenhouse gases you spew in daily life really help save us from global warming? *East Bay Monthly*, August 2007. http://www.themonthly.com/feature-08-07.html

(Optional) http://en.wikipedia.org/wiki/Personal_carbon_trading)

(Optional) Thøgersen, John. 2002. Promoting "Green" Consumer Behavior with Eco-Labels. Chapter 5 in *New Tools for Environmental Protection*, edited by Thomas Dietz and Paul Stern (Washington, DC: National Academy Press), pp. 83-104.

(Optional) The European Eco-label At A Glance. 2001. On line (accessed 12/22/03) at *http://europa.eu.int/comm/environment/ecolabel/pdf/triptyque/versionfinal_en.pdf*

(Optional) For examples of product standards see *http://europa.eu.int/comm/environment/ecolabel/marketing/brochures.htm*

(Optional) For additional information on eco-labels, see also *www.eco-labels.org*

March 5 Changing incentives / household energy use

What are the strengths and limitations of trying to change people's environmental behavior by changing the economic incentives they face? Is it true that if we just fixed the incentives, such as raising the price of environmentally damaging goods and services, they would make environmentally responsible decisions?

What else would have to be true for this strategy to work? What can we learn from Gardner and Stern's findings on incentives programs for municipal waste reduction? For household energy conservation? For influencing environmental decisions of businesses? For incentive-based strategies more generally?

Case: household energy efficiency and conservation. North Carolina's major electric utilities have recently been mandated to promote energy conservation and renewable energy use far more aggressively (SB 3, enacted in 2007). Other states such as Texas and California, and some utilities such as Austin Energy, already offer far more incentives for these purposes than North Carolina's new requirements. What lessons does experience with economic incentives offer for designing effective incentives for individual actions to improve household energy conservation?

Gardner, Gerald, and Paul Stern. 2002. Changing the Incentives. From Chapter 5 in their *Environmental Problems and Human Behavior* (Boston, MA: Pearson Custom Publishing, 2002, 2nd edition), pp. 95-124.

NC State Energy Office residential programs.
http://www.energync.net/programs/residential.html

Duke Energy efficiency and conservation programs. http://www.duke-energy.com/north-carolina/savings.asp

Austin (TX) Energy: a model utility for energy conservation incentives.
http://www.austinenergy.com/About%20Us/Newsroom/Press%20Releases/2007/conservationPrograms.htm
http://www.austinenergy.com/Residential/index.htm

Texas State Energy Conservation Office incentives resource page.
http://www.infinitepower.org/incentives.htm

Sample residential energy conservation incentives available in Sacramento, CA (from Flex Your Power, CA's statewide energy conservation marketing program)
http://www.fypower.org/res/tools/rgl_results.html?z=95819&s=res

(Optional) Stern, Paul C. 1986. Blind Spots in Policy Analysis: What Economics Doesn't Say about Energy Use. *Journal of Policy Analysis and Management* 5:200-227.

March 10, 12 No class *(Spring Break)*

March 17 Second paper due.

V. Environmental Decisions By Businesses

(NOTE: Presentations due April 2: start thinking about it now!)

Team Presentations (3 groups due March 31, the others due April 2)
Team assignments (teams to be assigned): As a team, brainstorm and come prepared to present strategies to influence businesses in a particular sector (as described below) to reduce greenhouse gas emissions. In each case you are challenged to address a particular type of business and sector whose characteristics may differ in at least some respects from others. Think particularly about what characteristics of the kind of business itself, as well as the environmental impacts of its operations, should influence your choice of strategy (big vs. small operation? Corporation or small business? Old vs. new production units? Who makes key envr. decisions, and at what level of the organization? Other relevant characteristics …?).

Each team will have a maximum of 10 minutes to present its ideas, followed by 10 minutes of class discussion. Be prepared to present your team's ideas on no more than 3-5 overheads, Powerpoint slides, or paper highlights pages (32 copies needed). Also be prepared to turn in copies of the final presentations, with a summary of each team member's contributions to it.

You are encouraged to use your combined efforts to find out enough about the individual issue to make plausible recommendations, while recognizing that this is not a fully developed research project. This will probably require a couple of team meetings outside of class, with individual work effort in between them, so be sure to get together and arrange these well ahead of time. You can reach each other by email using the Blackboard web site email function.

Team 1: A major residential or commercial construction/development firm (such as the firm that is about to build the huge Briar Chapel development in Chatham County, or one that builds major shopping centers): adopting "green building" standards

Team 2: An investor-owned U.S. electric power utility (such as Southern Company, Duke or Progress Energy): radically reducing fossil-fuel combustion emissions (major shift toward "greener" energy sources)

Team 3: A large hog or poultry farm, or one of the major hog- or poultry- production corporations (such as Smithfield Foods or Perdue) for which most large hog or poultry farms are contractual producers: radically reducing emissions of air pollutants such as methane and ammonia.

Team 4: A major consumer products or transport services company (e.g. Wal-Mart or Fedex): radically reducing air pollution and greenhouse gas emissions associated with transport of goods.

Team 5: An industry in which significant amounts of pollution are generated by relatively small or medium-sized businesses (for instance metal finishing, automotive repair shops, dry cleaners, …)

Team 6: A government-owned business enterprise, such as a public school system or state university: radically reducing greenhouse gas emissions associated with energy use in buildings.

March 17 Introduction: How and why do businesses make environmental decisions?

Decisions by business organizations – about the materials and energy they use, about their production processes, and about their products – often have far greater environmental impact than those of individual consumers. How do businesses consider environmental impacts in making decisions that affect such impacts?

Who makes businesses' decisions affecting the environment, and what factors and pressures most strongly influence them? How do the environmental decisions of individuals as executives or agents of an organization differ from the environmental decisions they might make as individuals? What factors might cause such decisions to be different? Should they be different?

What are the distinctive characteristics of business corporations, and how do these characteristics affect their environmental (and other) decision-making?

Do you agree with Friedman's arguments about the nature and limits of corporate social responsibility? With which, and why or why not? Can you envision any circumstances in which he might be wrong (i.e. that corporations might have far broader social and environmental responsibilities than he suggests), or that would significantly modify the apparent blunt simplicity of his principles? Bring to class a list of your main points in response to these questions about Friedman's arguments.

Friedman, Milton S. 1970. The Social Responsibility of Business is to Increase Its Profits. *New York Times Magazine*, September 13, 1970.

(optional) Derber, Charles. 1998. What's Right and Wrong With Corporate Responsibility. Chapter 12 in *Corporation Nation* (NY: St. Martin's), pp. 221-41.

March 19 Why are some businesses "green" (but not others)?

Read the articles on BP and pp. 3-11 of the report of the World Business Council for Sustainable Development on corporate social responsibility, and at least skim SustainAbility's business case for corporate social and environmental responsibility. (Also review our January reading on business lessons from the Millennium Ecosystem Assessment).

Case: British Petroleum (BP). In the late 1990s, the CEO of British Petroleum rebranded the company as simply BP, announced that this name should also be taken to stand for "Beyond Petroleum," and launched a major initiative to position BP, the second-largest petroleum company in the world, as a "greener" company and as the corporate leader in dealing responsibly with global warming.

Is BP a "green" oil company? What factors might explain its "greener" strategy than competitors such as ExxonMobil? If BP's strategy works for BP, why aren't Exxon/Mobil and other oil companies following its lead? What are the barriers, and how could they be removed?

More generally, then, are WBCSD's claims of business commitment to social responsibility credible? Why do some businesses publicize themselves as leaders in environmental sustainability and corporate social responsibility, while

others continue to resist and even to violate environmental laws? Why are some companies active members of the Pew Climate Initiative and other environmental alliances, and others are actively resisting them?

Is there really a "triple bottom line" for some companies – creating greater value by combining economic profit *and* environmental sustainability *and* social equity – or just a more (or less) enlightened focus on a single bottom line? What kinds of corporations would you expect to be members of an organization such as WBCSD, and which ones not? What would Milton Friedman say about the WBCSD, and why? Are Friedman's arguments persuasive?

Depending on your answers, do corporate social responsibility initiatives offer an adequate basis for environmentally responsible decisions by businesses? If not, what other approaches should be considered? Government regulation? Environmental "codes of conduct" for all firms operating in each industry? Other approaches?

BP. 2002. BP Beats Greenhouse Gas Target By Eight Years And Aims To Stabilise Net Future Emissions. Press release, March 11, 2002.

Frey, Darcy. 2002. How Green Is BP? *The New York Times*, December 8, 2002, Section 6, p. 99

Mouawad, Jad. 2006. A Mission to Repeal Murphy's Law. *New York Times*, July 13, 2006: C1

World Business Council for Sustainable Development. 1999. "Corporate Social Responsibility In Brief" and "CSR—Delving Deeper." *Corporate Social Responsibility*. Geneva: WBCSD, pp. 3-11. On line (accessed 1/7/08) at http://www.wbcsd.org/DocRoot/Fc7YqesJY1mU6ilvhnSZ/CSRmeeting.pdf

(Skim, focusing on key arguments differing from Friedman's). SustainAbility.com. *Buried Treasure: Uncovering the Business Case for Corporate Sustainability.* On line (accessed 1-6-07) at http://www.sustainability.com/downloads_public/insight_reports/buried_treasure.pdf. *Note: if necessary, you can first register on this site at no cost at* http://www.sustainability.com/compass/register.asp?type=download&articleid=12

(Optional) For BP's environmental web pages see http://www.bp.com/subsection.do?categoryId=9004433&contentId=7007978 (and related links)

(Optional) For Exxon Mobil's environmental web pages see http://www.exxonmobil.com/Corporate/energy.aspx

March 24 Influencing environmental decision-making by businesses

Read the articles by Hart and Andrews below. Taken together, these articles suggest potentially contradictory approaches for influencing business decisions

toward greater environmental protection and sustainability: government regulation and enforcement, or cooperative approaches based on a presumption that innovation and cooperation are in businesses' own self-interest (and in the following session, pressures by environmental advocacy groups as well).

Regulation. Friedman argued that businesses' only social responsibility, other than making a profit, is to follow the law. If he is correct, then laws and regulations, not just corporate social responsibility or "voluntary" initiatives may be necessary constraints for businesses to protect the "open access resources" of air and water from pollution and overuse. Most studies conclude that the environmental regulations of the past several decades have in fact played a major role in reducing air pollution, water pollution, and hazardous wastes from businesses, and that they also have turned waste management itself into a far safer and more professionally (and profitably) managed business than previously existed. But many scholars also argue that regulations can be inefficient (more costly than more "market-oriented" incentives), and not as effective for solving longer-term environmental problems that remain.

What effects do environmental regulations have on businesses' decisions and behavior? On businesses' values, beliefs and information, and incentives? What kinds of regulations would you expect to be least effective, and what kinds most effective, in promoting better environmental decisions and behavior by businesses? What differences in effects would you expect from so-called "market-oriented" regulations, such as those allowing businesses to "trade" pollution allowances under an overall "cap"? What about effects of information-disclosure or liability-based regulations?

What kinds of businesses would you expect to be most successful in improving their environmental performance when faced with such regulations, and what kinds least successful? What differences would you expect to result from the business's size? Its profitability? Competition? Technological innovation? Visibility to the public? Political influence? Other factors? What then are the overall strengths and limitations of environmental regulations for influencing business behavior and decision-making toward the environment?

Innovation, creative advantage, and business self-interest. In contrast, are "sustainable enterprise" and "natural capitalism" fringe ideas, or the way of the future? If these ideas are so promising, why haven't they already dominated the market economy? What conditions or factors would have to be present for these environmentally preferable ideas to spread to all businesses that significantly affect the environment? What roles do public policies play in defining these conditions for success, and how might they be enhanced?

Cases: Bring examples to class of businesses that you think are doing a good job environmentally, and of companies that you think are not doing so. What's the difference, and what are possible reasons for them?

Hart, Stuart L. 1999. Business Decision Making About the Environment: The Challenge of Sustainability. Chapter 4 in *Better Environmental Decisions: Strategies for*

Governments, Businesses, and Communities, edited by Ken Sexton et al. Washington, DC: Island Press, pp. 77-90.

Andrews, R. N. L. 1998. Environmental Regulation and Business "Self-Regulation." *Policy Sciences*, v. 31, no. 3, pp. 177-97.

(Optional) Lovins, Amory; Lovins, L. Hunter; and Paul Hawken. 1999. A Road Map to Natural Capitalism. *Harvard Business Review* (May-June 1999), pp. 145-58.

(Optional) Book, *Natural Capitalism* (by Hawken, Lovins and Lovins): An excellent book-length presentation of these ideas, with individual chapters on many specific industries and examples of ways of profitably achieving greater environmental sustainability by businesses. Downloadable chapters available on line at http://www.natcap.org/sitepages/pid20.php

March 26 Case: Green buildings and the development, construction, and buildings management industries

Buildings of all kinds make up one of the major drivers of environmental impact: on energy and materials use, air and water pollution, landscape transformation, and many other impacts. They also are one of the major types of long-term fixed investments that once built, determine such impacts for many decades. Creating and using buildings, in turn, involves a wide range of decision-makers with varied values and attitudes, information and beliefs, and incentives; and these also may differ with different types of buildings (housing, commercial, mixed-use, and other types of developments such as universities and other institutions).

In recent years there has been a substantial increase of interest in developing "green buildings" (see readings below), but such buildings are still a small minority of the new buildings under construction, and are also far outnumbered by the large existing stock of older buildings still in use.

Who makes decisions about buildings and their environmental impacts, and how these decisions can be influenced toward greater environmental sustainability. Do third-party certification programs such as LEED certification offer a promising strategy, or merely a cosmetic benefit or "niche market?" What other information, incentives, and other strategies might effectively promote "greener" construction and operation of buildings by those who make such decisions?

U.S. Green Buildings Council. 2003. An Introduction to the U.S. Green Building Council and the LEED^{tm} Green Building Rating System. On line (accessed 1/6/08) at http://www.usgbc.org/Docs/About/usgbc_intro.ppt

(Optional) Kats, Gregory H. 2003. *Green Building Costs and Financial Benefits*. Massachusetts Technology Collaborative. On line (accessed 1/6/08) at http://www.mtpc.org/RenewableEnergy/green_buildings/GreenBuildingspaper.pdf

March 31 **Presentations: Influencing environmental decisions of businesses**
April 2 **Presentations (continued: remaining 3 teams)**

VI. Environmental Decision-Making by Governments

(NOTE: Paper due April 25: start thinking about it now!)

Final paper

For your final paper (due April 25), choose one of the NC Climate Action Policy Advisory Group (CAPAG) policy recommendations to mitigate climate change (or your own policy recommendation, if you would prefer to propose some other policy instead), and write a 5-8 page paper summarizing what you would expect to be the strongest arguments in favor of this policy, the most significant barriers to its adoption and implementation, and what strategies you would use to try to influence government's behavior to adopt it. (See April 9 readings for CAPAG recommendations)

April 7 Introduction: environmental decision-making by legislatures

How do governments' agendas for decisions affecting the environment get set? How does a policy goal such as environmental protection or sustainability get on the governmental agenda, or get taken off of it? How do *political* processes influence this result?

Which of Kraft and Furlong's models of political decision-making is most persuasive to you as an explanation of how Congress makes environmental policy decisions (elite theory, group theory, institutional theory, rational choice theory, political systems theory, …), and why? How do issues get framed as legislative decision issues, what factors affect the framing and agenda-setting process, and how do these answers affect the outcomes?

Read the chapter by Rabe and his more recent report for the Pew Center. How does environmental decision-making by state governments differ from national decision-making by the U.S. Congress, and from the textbook models described by Kraft and Furlong? What differences in opportunities and limitations for environmental initiatives do state government decision processes present, as opposed to national ones?

Kraft, Michael E., and Scott R. Furlong. 2004. Understanding the Politics of Public Policy. Chapter 3 in their *Public Policy: Politics, Analysis, and Alternatives* (Washington, DC: CQ Press), pp. 68-99.

Rabe, Barry G. 2004. The Politics of Climate Change, State Style. Chapter 1 in his *Statehouse and Greenhouse: The Emerging Politics of American Climate Change Policy* (Washington, DC: Brookings), pp. 1-37.

(Optional) Rabe, Barry G. *Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards.* Prepared for the Pew Center on Global Climate

Change, June 2006. On line (accessed December 31, 2007) at http://www.pewclimate.org/docUploads/RPSReportFinal%2Epdf

April 9 Climate change decisions and behavior in North Carolina

North Carolina by itself, and the U.S. Southeast more generally, are significant contributors to global greenhouse gas emissions; they are also at significant risk for its potential consequences (e.g. droughts, increasing summer energy and water demand, sea level rise, possible increased frequency and intensity of hurricanes, others).

What goals and priorities should North Carolina consider to *mitigate* global warming? What are the most significant behavioral barriers to achieving those goals, and what kinds of policies might be most promising to overcome those barriers? What evidence and reasons for these policies might be most persuasive?

What goals and policies should North Carolina consider for *adaptation* to the potential effects of climate change? What are the most significant behavioral barriers to achieving those goals, and what kinds of policies might be most promising to overcome those barriers? What evidence and reasons for these policies might be most persuasive?

[Readings TBA]

April 14 Case: North Carolina's Legislative Commission on Global Climate Change and Climate Action Plan Advisory Group

North Carolina is one of many states, though one of the first in the South, that has begun to develop significant state legislation and other policy changes to mitigate global warming. It is also one of the states facing significant potential consequences of climate change to which it may have to adapt. In response to these concerns, the NC General Assembly in 2005 appointed a multi-stakeholder Legislative Commission on Global Climate Change (LCGCC); and the Department of Environment and Natural Resources also established a Climate Action Plan Advisory Group (CAPAG) which has also been developing recommendations for state government action.

Read the drafts of the LCGCC and CAPAG recommendations. What policies should North Carolina consider adopting in order to deal effectively with North Carolina's contributions to global climate change, and to deal with the potential impacts of climate change on North Carolina? What lessons does Rabe's analysis of state climate-change initiatives offer?

NC Climate Action Plan Advisory Group. 2007. Executive Summary and chapters 3 and 5 (and others optional), discussion draft dated October 16, 2007. http://www.ncclimatechange.us/capag.cfm (accessed December 31, 2007).

(Optional) U.S. EPA. 1998. Climate Change and North Carolina. On line at

http://www.duke.edu/web/ESC/documents/Global%20Warming%20Impact%20on%20NC.pdf (accessed December 31, 2007).

(Optional) Environmental Defense. 2005. *Understanding Global Warming for North Carolina*. Raleigh, NC: Environmental Defense. On line at http://www.environmentaldefense.org/documents/3053_NCClimateReport.pdf (accessed December 31, 2007).

(Optional) Environmental Defense et al. 2007. *The Power To Choose: North Carolina's Clean-Energy Future*. Raleigh, NC: Environmental Defense. On line (accessed December 31, 2007)at http://www.environmentaldefense.org/documents/5971_NCCleanEnergyFuture.pdf

(Optional) There are also a number of interesting documents and presentations on http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14, the web site of the NCLCGCC (accessed December 31, 2007).

April 16 Decision-making by government operating enterprises / UNC

How do people serving as environmental managers in government agencies make decisions, and how do these practices influence the ways in which they make decisions affecting the environment?

Monastersky, Richard. 2007. Colleges Strain to Reach Climate Friendly Future. *Chronicle of Higher Education*, December 14, 2007. http://chronicle.com/weekly/v54/i16/16a00101.htm

UNC-Chapel Hill. 2007. *Strategic Energy and Water Plan.* October 2007. http://sustainability.unc.edu/Portals/0/Documents/FY07%20State%20Energy%20Report_Final_sig_spreadsheet.pdf

(Optional) UNC-Chapel Hill. 2007. *2007 Campus Sustainability Report.* http://sustainability.unc.edu/Portals/0/Documents/2007%20Sustainability%20Report_web.pdf

(Optional) UNC-Chapel Hill. (n.d.). Sustainability policy documents and resources. http://sustainability.unc.edu/Default.aspx?tabid=158

April 21 Decision-making by local governments / Chapel Hill

Crawford-Brown, Douglas. 2005. Moving forward on the Community Carbon Reduction (CRed) pledge in Chapel Hill. Report to Town of Chapel Hill, June 12, 2006 (*revised June 17, 2006).* http://townhall.townofchapelhill.org/agendas/2006/06/26/12/12-2_final_report_and_pledge.pdf

(Optional) See also ENST 94 class project, Spring 2005, at http://www.unc.edu/~jrhester/, and especially its section on policy options: http://www.unc.edu/~jrhester/policy.html

(Optional) for other local government initiatives see also the CRed Central initiatives list: http://www.cred-uk.org/WhatHaveWeDone.aspx

April 23 Paper 4 due

April 23 Last class: final discussion

What are the most lessons from what we have discussed concerning ways to change human decisions and behavior that affect environmental problems such as global warming?

What does Diamond identify as the key problems in environmental decision-making that have shaped the success or failure of civilizations? How might these considerations apply to decisions affecting climate change and other current trends in global environmental change?

What does the Millennium Ecosystem Assessment identify as the most important changes in environmental decision-making that are needed today to achieve an environmentally sustainable future for our civilization?

What other key lessons have we learned this semester about environmental decision-making, and what other aspects of environmental decision-making should we note that we did not discuss?

Diamond, Jared. 2004. Lessons From Environmental Collapses of Past Societies. Fourth Annual John F. Chafee Memorial Lecture on Science and the Environment, National Council for Science and the Environment, January 29, 2004. Read particularly the section toward the end on a hierarchy or sequence of four decision points that may result in good or bad decisions (in the article, hit "CTRL-F" and type in "hierarchy"). On line (accessed 12/29/2007) at http://www.ncseonline.org/ncseconference/2004conference/page_fid=4142.cfm

(Alternate source – on Blackboard) Diamond, Jared. 2004. Lessons From Environmental Collapses of Past Societies. Fourth Annual John F. Chafee Memorial Lecture on Science and the Environment, National Council for Science and the Environment, January 29, 2004. Read pp. 18-35, with particular attention to pages 25-33.

Millennium Ecosystem Assessment. 2005. Options for the Future. Pp. 21-23 (Adobe pp. 23-25) in its *Living Beyond Our Means: Natural Assets and Human Well-Being*. On line (accessed 12/29/2007) at http://www.millenniumassessment.org/documents/document.429.aspx.pdf

FINAL EXAM: The final exam will be given as a take-home exam. It will be distributed at the final class, Wednesday, April 23, and will be due at 4:00

p.m. on <u>FRIDAY, MAY 2</u>. (This is the same time as the scheduled exam time for this class).