

# HUMAN IMPACT ON THE ENVIRONMENT

GEOGRAPHY 113 — SPRING 2008

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## OVERVIEW

*Humans now have a power to affect the world which is unmatched by any other organism, and unmatched in any previous time in history. That power is both positive and negative—we have changed the world to feed billions of people, and we have destroyed millions of acres of forest in the process, for example.*

*This course is an examination of what we know about the human impact on the environment, and how we know it. That is, this environmental science course is about the environment and about science.*

*The topic of “environmental science” is socially important — as we recognize the value of the landscape we humans are threatening, and think about how to protect it for ourselves and others.*

*Interest in the environmental grows out of humans’ love of the natural world ... it can be a healthy and affirmative look at the world — as well as a study in pathology.*

## CONTENT

Here are five general principles which will guide our discussions:

1. The natural environment is a complex system, but its parts are generally homeostatic—that is, the inherent tendency of the various parts of the environment is to minimize change.

2. Environmental degradation by humans is at least 40,000 years old, but our ability to alter the environment has recently increased exponentially as our numbers and our technical power have grown; it is now changing before our eyes.

3. The first intellectual tool we should use to approach environmental issues is science, the systematic analysis of the evidence around us, a way of knowing, and of having a certain level of confidence in our knowledge.

4. Environmental issues are far more than just technical issues; we must also understand the social and psychological influences on humans' environmental behavior to understand how we've gotten into these circumstances.

5. Nothing is inherently good or bad in environmental affairs (although it might seem so to us, as it does to the others who disagree with us). We must bring our own values to these issues — and we should recognize what they are. We must use our own resources to see them as resolvable.

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## ORGANIZATION

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The course has several components:

1. **Lecture period** is devoted to introducing new ideas, processing reading material and homework, discussing and answering questions. I intend to provide daily outline of the essential points & terms from lecture.
2. **Readings**, as listed on the outline, come from Miller, *Living in the environment*, 15<sup>th</sup> ed. The material in the book is support for the material presented in lecture. Use the book more as a reference than as a bible. If you are generally comfortable with the material, you may want to wait until after the lecture to read the book, so you will know which parts I think are important.
3. Expect a **quiz** most Fridays on the material covered since the previous quiz. No make-ups, usually, but I'll drop your lowest grade. Additional short writing projects will be assigned.
4. Two **projects** will be assigned on (1) measuring, evaluating, and reporting upon a human environmental impact, and (2) reaching a conclusion about a policy action to affect the environment.
5. Three **exams** are scheduled. You will need to be able to use the ideas from the course (and not simply to remember the terms); we'll have lots of preparation for this before the first one.

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## MAJOR THEMES

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Events come and go; while we will look at a series of environmental problems, our main focus will be in a series of general principles that underlie today's, and every year's, problems.

## EVALUATION

Here are the projected grade weights. All grades are scaled against your colleagues, and rescaled at the end of the semester.

Two hourly exams	30%
Quizzes & small assignments	20%
Final exam	20%
2 projects	25%
Class participation	5%

## HELP

Please see me if I can give you advice on how to study, if I can guide you to books to help you, or if I can help clarify specific concepts. I am usually available in my office MWF mornings, any day after class, and often all day TTh (but call/email ahead to be sure).

## TENTATIVE CLASS SCHEDULE

Date	Day	Topic	Chapters from 'Miller'
16-Jan	W	The study of the human environment	1. Environmental Problems, Their Causes, and Sustainability.
18-Jan	F	Systems & cycles: Why do we still have mountains?	2. Science, Systems, Matter, and Energy.
21-Jan	M	Physical limits of the environment .. thermodynamics & material cycles	
23-Jan	W	The ecosystem	3. Ecosystems: What Are They and How Do They Work?
25-Jan	F	Ecology & human evolution	4. Evolution and Biodiversity.
28-Jan	M	Population and the environment	9. Applying Population Ecology: The Human Population.
30-Jan	W	Population history & futures	
1-Feb	F	Limits to growth	24. Economics, Environment, and Sustainability.
4-Feb	M	History of food	13. Food, Soil Conservation, and Pest Management.
6-Feb	W	Production of food	
8-Feb	F	Weaknesses of modern agriculture	14. Water.
11-Feb	M	Alternate agricultural systems	
13-Feb	W	Instabilities of agriculture	
15-Feb	F	Feeding the next billions	

18-Feb	M	<b>EXAM I</b>	
20-Feb	W	Value of natural organisms	Part III: SUSTAINING BIODIVERSITY.
22-Feb	F	Threats to species	26. Environmental Worldviews, Ethics, and Sustainability.
25-Feb	M	Organisms out of place: exotics	
27-Feb	W	Resources and pollution	15. Geology and Nonrenewable Mineral Resources.
29-Feb	F	Energy, as the ultimate resource	16. Nonrenewable Energy Resources.
3-Mar	M	Nature, culture, energy	
5-Mar	W	Sources of energy	
7-Mar	F	Costs of energy use	17. Energy Efficiency and Renewable Energy.
10-Mar		Break	
12-Mar		Break	
14-Mar		Break	
17-Mar	M	Uses, end uses, and reuse of energy	
19-Mar	W	<b>EXAM II</b>	
21-Mar	F	Air pollution	19. Air Pollution.
24-Mar	M	Scale and vulnerability in air pollution	
26-Mar	W	Green house gases	20. Climate Change and Ozone Loss.
28-Mar	F	Global warming	
31-Mar	M	Disease and the environment	18. Environmental Hazards and Human Health.
2-Apr	W	Evolution, civilization, and sickness	
4-Apr	F	Carcinogens	
7-Apr	M	Regulation of risk	
9-Apr	w	Waste stream	21. Water Pollution., 22. Solid and Hazardous Waste.
11-Apr	F	Hazardous waste disposal	
14-Apr	M	The technological fix (class scheduling uncertain)	
16-Apr	W	Landuse and environmental protection (class scheduling uncertain)	23. Sustainable Cities.
18-Apr	F	Hazards	25. Politics, Environment, and Sustainability.
21-Apr	M	Zoning	
23-Apr	W	Case studies	
25-Apr	F	Case studies	
28-Apr	M	Environmental futures	