Econ 241
Natural Resource Economics
Wake Forest University
Spring 2013

Professor Robert Whaples
124 Carswell Hall
(336) 758-4916
whaples@wfu.edu

Office Hours: MWF 11 or by arrangement. I'm generally around from 8:30 to 5, Monday through Friday.

Grades: There will be frequent quizzes and short assignments (20% of the course grade), two midterm exams (60%) and a term paper (20%).

Textbook: *Environmental and Natural Resource Economics* by Tietenberg and Lewis (9th edition). Numerous additional short readings will be emailed to you during the semester.

T & L = Tietenberg and Lewis textbook

Weeks 1 and 2: The Economic Approach to Resources and the Environment – Property Rights, Externalities, Benefit-Cost Analysis, and Methods for Valuing the Environment
T & L chapters 1-4

Week 3: Dynamic Analysis, Sustainable Development and Depletable Resource Allocation
T & L chapters 5-6
Kenneth Arrow et al., "Are We Consuming Too Much?" *Journal of Economic Perspectives*.
Robert Whaples, "Collapse? The 'Dismal' Science Doesn't Think So," *Independent Review*.
Jim Alty on sustainability at WFU

The Arrow et al. article introduces the economic approach to sustainability. Among the co-authors is Paul Ehrlich, an environmentalist well-known for his dire predictions – predictions which didn't pan out. Apparently, he has given up this past pessimism. The article defines sustainability by focusing on current consumption. Current consumption is excessive if lowering it and increasing investment could raise future well-being enough to more than compensate for the loss in current well-being. The authors conclude that, in most cases, we are *not* consuming too much – a conclusion that is sure to generate a lot of discussion about these economic concepts and how to measure them. The authors argues that sustainability can be measured by looking at "Genuine Investment," which is estimated by looking at *all* types of investment – manufactured capital, human capital (education and learned skills), natural capital (i.e. natural resources) and the knowledge base. If the stock of natural capital falls, economies can still sustain (or expand) their

well-being if the other forms of capital and knowledge increase enough. It estimates the amount of genuine investment from 1970-2001 and concludes that it was positive for all regions of the world, except for the Middle East and Sub-Saharan Africa. My own survey of economists discusses why economists predict that our past economic growth is sustainable and is likely to be followed by a future of continued economic growth.

Jim Alty's talk at the Sustainability across the Curriculum Workshop focused on the "Campus as a Living Laboratory." I'd like to invite him to class to cover the same material, especially the ways that Facilities & Campus Services measures costs and benefits in making its decisions, how WFU works toward sustainability of resources, and the data they collect. I will create a short assignment for students to examine campus data, probably data from their website on energy usage – and ask them to brainstorm on ways to measurably reduce WFU's resource use in a cost-effective manner.

Weeks 4 and 5: Energy
T & L chapter 7
James Hamilton, "Historical Oil Shocks," from Parker and Whaples, editors, *Routledge Handbook of Modern Economic Events*
Kenneth Green, "Abundant Energy: The Fuel of Human Flourishing," American Enterprise Institute
WFU Energizing the Future Conference, Panel on the Economics of Energy, http://energy2010.wfu.edu/conference-videos/.
Geoffrey Heal, "The Economics of Renewable Energy," NBER Working Paper 15081.

Heal, a proponent of promoting and subsidizing renewable energy, takes a careful look at each type of renewable energy – hydro, solar (photovoltaic and thermal), wind, geothermal, tidal, biofuels, and waste-to-energy – to assess which are feasible. The goal is to see which horse to back if and when we adopt carbon taxes and thereby increase the market price of fossil fuels (especially coal). Most renewables involve high fixed costs and lower marginal cost, meaning we've got to pay much of the bill upfront. He discusses the key drawback of the most otherwise promising renewables – wind and solar – which suffer from intermittency and locational problems. He also discusses evolving methods of "storing" power to offset these problems; and costs of carbon capture.

Week 6: Common-Pool Resources
T & L chapter 13

Week 7: Recyclable Resources
T & L chapter 8
Daniel Benjamin, "Recycling Myths Revisited," PERC Policy Series.
Recycling at WFU, field trip to W-S landfill?

I will invite a speaker to class to discuss recycling on campus and hopefully to collect data on its

costs and benefits – e.g. how much does WFU earn from selling the materials it collects.

Weeks 8 and 9: Economics of Pollution
T & L chapters 14-15, 17-19
Ian Parry, Margaret Walls, and Winston Harrington, "Automobile Externalities and Policies,"
Resources for the Future Discussion Paper (published in *Journal of Economic Literature*)

The "WFU Trash Challenge": following the "two-legged exercise" from the Sustainability across the Curriculum Workshop, I'll bring to class bottles and cans that I've picked up walking from home to campus and back. I'll ask students to analyze why I routinely find recyclable litter (and other trash) on my walk and to brainstorm about ways to lessen this local form of pollution. Perhaps my demonstration effect of the low marginal cost of eliminating this form of pollution will lead to students also collect recyclable wastes. I'll share with students the spreadsheet I've created on the daily amounts of aluminum, plastic and glass that I collect and we'll examine the data.

Weeks 10: Climate Change
T & L chapter 16
Richard Tol, "The Economic Effects of Climate Change,"*Journal of Economic Perspectives*.
Steven Levitt and Stephen Dubner, "What Do Al Gore and Mount Pinatubo Have in Common?"
from *Superfreakonomics*

Levitt and Dubner's chapter focuses on low-cost technology that can mitigate the effects of rising levels of greenhouse gasses. We'll discuss the usefulness of such technologies and whether or not achieving sustainable levels of GHGs is costly or inexpensive.

Week 11: Population and the Quest for Sustainable Development
T & L chapters 20-21
Randall Rucker and Walter Thurman, "Colony Collapse Disorder: The Market Response to Bee Disease," PERC Policy Series.

One theme of the class is that the market gives entrepreneurs strong incentives to conserve resources and to develop cost-effective solutions to environmental problems when they can make a profit doing so. Colony Collapse Disorder, whose cause is not well known, has caused substantial problems for beekeepers and the crops that they pollinate. This reading documents how the market has successfully responded, sustaining bee populations and their pollination in the face of this threat. Thurman is a professor at NC State and I intend to invite him to speak on the subject.

Weeks 12-14
Student paper presentations of term papers.

Econ 241
Long Paper

Length: About 12 pages
Due:

Assignment: Recommend a course of action on some natural resource/environmental policy question, after a careful examination of the theoretical and empirical issues.

1. Structure of the Paper:
a. Identify the problem- give data and explain theoretically (e.g., use economic graphs).
b. Survey solutions which others have proposed, explaining their strengths and weaknesses.
c. Propose your own solution, explaining why it is better than the alternatives. Show some originality. Be explicit about the normative assumptions you are making. Be explicit about the trade-offs (e.g. short-run vs. long-run, efficiency vs. equity, winners vs. losers, economic quality vs. environmental quality) that are involved.
2. Sources:
a. Consult scholarly journals (such as the *Journal of Economic Perspectives*) and books.
b. Search the EconLit data base.
c. Use the business press (e.g. the *Wall Street Journal* or the *Economist*) for up-to-date information.
d. Only after consulting these sources should you search for sources on the internet. Avoid low-quality internet sources that don't include documentation for their points.
e. The best internet sources are scholarly working papers and "think tank" papers from policy organizations like the American Enterprise Institute, the Brookings Institution, the Cato Institute, the National Bureau of Economic Research, the National Center for Policy Analysis, and Resources for the Future.
3. Citations and notes. Include short citations within the text (e.g. Smith, 1997, p. 105) and full citations at the end of the paper backing up any theoretical arguments or empirical evidence. Turn in a photocopy or supply a URL for all citations. (I.E., when I read your paper, I need to have at my disposal all empirical evidence that you cite.)
4. You may not pick a topic which we will otherwise be discussing in class.
5. Title: What Should We Do about _____?
6. Turn in a paper copy of your paper and email a copy to everyone in the class.

Discussion
1. Class members will read one of the papers presented during each session and turn in a 150-word overview and assessment of the paper, identifying any empirical or theoretical shortcomings.
2. You will lead a class discussion focused on the paper. The discussion will last about 25 minutes. In the first five or ten minutes you should summarize the paper. Be prepared for questions.