

Course syllabus, “Economics of Human-Environment Interactions”
EVPP 525 / GEOG 525 / ECON 895-006
Fall 2008, George Mason University
Last revised October 8, 2008

Instructor: Dr. Dawn Parker

Assistant Professor, Department of Computational Social Science; Affiliate, Depts. of Environmental Science and Policy and Geography and Geoinformation Science

Office: Center for Social Complexity, 374 Research 1

Phone: 703-993-4640

E-mail: dparker3@gmu.edu

Office hours: By appointment, Wed. 3-4 and Thus. 3-4 (Call to let me know you are coming by so that I can listen for the doorbell.)

Website: <http://mason.gmu.edu/~dparker3>

Meeting time and location: Wednesdays 4:30-7:10 PM, Enterprise Hall 276

Class Web Site (Public): http://mason.gmu.edu/~dparker3/econ_hei/econ_hei.html

Required Texts:

Hackett, S. C. 2001. *Environmental and Natural Resource Economics: Theory, Policy, and the Sustainable Society*. M. E. Sharpe, Armonk, NY

Perman, R., Y. Ma, J. McGilvray, and M. Common. 2003. *Natural Resource and Environmental Economics*. Pearson Addison Wesley, New York

Daly, H. E. and Farley, J. (2004) *Ecological Economics: Principles and Applications*. Island Press, Washington (1st ed.)

Description: This course covers advanced topics in environmental, resource, and ecological economics, with a focus on the sustainability of human economic activities and their impact on the natural environment. Particular focus will be placed on intertemporal resource allocation. The reading for the class are grounded in traditional neoclassical economic models and recent extensions in the areas of sustainability, behavioral economics, spatial modeling, and bioeconomic modeling. While there is some overlap with the field of ecological economics, this is not a pure ecological economics class. The course will consist of overview lectures, student presentations, and discussions of weekly readings and short writing assignments. Student participation is encouraged throughout.

Prerequisites: Any student who has taken EVPP/GEOG524 (Introduction to Environmental and Resource Economics) or the equivalent may take this class. Students should be proficient in basic microeconomics at an advanced undergraduate or beginning master’s level. In addition, students will be expected to have completed at least one

semester of introductory environmental and resource economics. The ability to solve simple systems of linear equations and familiarity with exponential and logarithmic functions is required. An understanding of calculus is helpful, but not required. Because much of the mathematics for this class is so advanced, in many cases, we will not go over, and you will not be required to replicate, the mathematics used in the papers. We will instead focus on the main ideas of the papers, their applicability, and their implications for sustainability. I am, however, happy to focus on mathematical details with more advanced students. The Perman book has a very nice presentation of the more advanced math.

Goals of the Course: Having completed the course, student should be able to use economic logic to discuss the sustainability of human activity and the impacts of human-environment interactions. Students should also be able to discuss the strengths and limitations of the neoclassical economic approach to modeling the impacts of human-environment interactions. Students should also be able to verbally apply the concepts learned in class to analysis of real-world problems, including in-depth analysis of a particular topic of interest.

Course Requirements and Grading: Each student will be required to present 2 articles to the class and lead class discussion. Papers for student presentation are marked with an * on the syllabus. I will hand out a spreadsheet so that you can request articles you would like to present. Students will also complete a term paper on a related topic of interest and present their findings to the class at the end of the semester. Term papers can focus on literature review, case studies, or, for more advanced students, development of an economic model. Students will also be required to complete weekly short writing assignment and very occasional analytical home works, with greatest emphasis on written work that synthesizes the course readings and discussions. Students may also be required to read and comment on other students' short writing assignments. A take-home final exam will be given. Grades will be based on the following:

Paper presentations and class participation: 25%

Homework/writing assignments: 25%

Term paper and presentation: 25%

Final Exam: 25%

Weekly writing assignments should be e-mailed to me posted by 9 AM Tuesday morning. Late homeworks/writing assignments will not be accepted. However, you may make up two missed assignment by reporting to the class on an outside seminar or interesting article that you have found (with my approval of the topic), or alternatively, your lowest two assignment grades will be dropped. Since it is not possible to make up a paper presentation, please be sure that you will be in town the day that you are required to present a paper. Late abstracts and term papers lose 1/4 letter grade per day. Late take-home final exams cannot be accepted, because of the short deadline I face for posting final grades.

Potential term paper topics: Depending on the student's interests and abilities, the term paper can be in the form of a literature review or, for more advanced students, development of a theoretical or empirical model designed to investigate a specific hypothesis. Term papers can potentially expand on topics already covered in the course. Other potential topics include the economics of global climate change, industrial ecology, sustainable development, endangered species preservation, altruism, the economics of invasive species, protected area management, ecological economics, etc. (Any of these topics would require a narrower focus to be a successful term paper). Literature reviews should be sufficiently narrow so that no more than around 15 articles are required for a thorough review. An extended abstract (2 pages double spaced) and bibliography are due to me on Oct. 8, and final papers are due Nov. 19. The final paper should be 20-30 pages in length, double spaced 12 point font, including tables, figures, and bibliography. Your bibliography and final paper must incorporate at least four references from economics journals. Late papers will be penalized a quarter of a letter grade per day. Please review your potential paper topic with me before getting started.

Course schedule and required readings:

Week 1: (Aug. 27) Introduction

Strengths and limitations of the neoclassical economics approach

Open challenges in the economics of human-environment interactions

1. Perman chapter 2: "The origins of the sustainability problem"
2. Daly, introduction, Chapter 1, 2, and 3 (Chapter 2 from p. 29 on can give lighter read)
3. Krutilla, J. V. 1967. Conservation Reconsidered. *American Economic Review* 57 (4): 777-786.

Week 2: (Sept. 3) The Stern Report Debate: Framing the issues

1. Nordhaus, W. 2007. Critical Assumptions in the Stern Review on Climate Change. *Science* 317: 201-202
2. Stern, N., and C. Taylor. 2007. Climate Change: Risk, Ethics, and the Stern Review. *Science* 317: 203-204.
3. Mendelsohn, R. 2008. Is the Stern Review an Economic Analysis? *Review of Environmental Economics and Policy* 2 (1): 45-60.
4. Sterner, T., and U. M. Persson. 2008. An Even Sterner Review: Introducing Relative Prices into the Discounting Debate. *Review of Environmental Economics and Policy* 2 (1): 61-76.
5. Weyant, J. P. 2008. A Critique of the Stern Review's Mitigation Cost Analyses and Integrated Assessment. *Review of Environmental Economics and Policy* 2 (1): 77-93.
6. Dietz, S., and N. Stern. 2008. Why Economic Analysis Supports Strong Action on Climate Change: A Response to the Stern Review's Critics. *Review of Environmental Economics and Policy* 2 (1): 94-113.

7. Mendelsohn, R., T. Sterner, U. M. Persson, and J. P. Weyant. 2008. Comments on Simon Dietz and Nicholas Stern's Why Economic Analysis Supports Strong Action on Climate Change: A Response to the Stern Review's Critics. *Review of Environmental Economics and Policy* 2 (2): 309-313.

Week 3: (Sept. 10) Political Economy of Environmental Legislation

Article presentation choices due to me by 9 AM Tuesday Sept. 9

1. Hackett, chapter 8: "The Political Economy of Environmental Regulation and Resource Management"
2. *Keohane, N. O., R. Revesz, and R. Stavins. 2000. The choice of regulatory instruments in environmental policy. Pages 559-602 in R. Stavins, ed. *Economics of the Environment: Selected Readings*. W. W. Norton, New York.

Intergenerational issues

Week 4: (Sept. 17) Discounting: standard methodology

Non-exponential discounting

Time inconsistency

1. Hackett, pp. 313-320.
2. Rabin, M. 1998. Psychology and economics. *Journal of Economic Literature* 36 (1): 11-46.
3. Rabin, M. 2002. A perspective on psychology and economics. *European Economic Review* 46 (4-5): 657-685. Section 2.5.
4. *Brekke, K. A., and O. Johannson-Stenman. 2008. The Behavioural Economics of Climate Change. School of Business, Economics, and Law, University of Gothenburg Publication 305. (P. 4-14).
5. *Pezzey, J. C. V. 2006. Reconsidering reconsidered: Why sustainable discounting need not be inconsistent over time in D. Pannell and S. Schilizzi, eds. *Discounting and Discount Rates in Theory and Practice*. Edward Elgar, Cheltenham, p 69-76.

Weeks 5 and 6: (Sept. 24 and Oct. 1) Evaluating Sustainability

Intergenerational equity criteria

Economic definitions of sustainability

Ecological vs. Economic sustainability

1. Perman Chapter 4: "Concepts of Sustainability"
2. Pezzey, J. C. V., and M. A. Toman. 2002. Introduction in J. C. V. Pezzey and M. A. Toman, eds. *The Economics of Sustainability*. Ashgate, Aldershot, UK. (Optional)
3. *Ayres, R. U. 2008. Sustainability economics: Where do we stand? *Ecological Economics* In Press. <http://dx.doi.org/10.1016/j.ecolecon.2007.12.009>.
4. *Solow, R. 1994. An Almost Practical Step Toward Sustainability in E. a. R. Commission on Geosciences, ed.

Assigning Economic Value to Natural Resources. National Academy Press.

5. *Ekins, P., S. Simon, L. Deutsch, C. Folke, and R. D. Groot. 2003. A framework for the practical application of the concepts of critical natural capital and strong sustainability. *Ecological Economics* 44 (2-3): 165-185.

Week 7: (Oct. 8) More behavioral economics

Term Paper Abstracts Due

1. Rabin, M. 1998. Psychology and economics. *Journal of Economic Literature* 36 (1): 11-46
2. Rabin, M. 2002. A perspective on psychology and economics. *European Economic Review* 46 (4-5): 657-685.
<http://www.sciencedirect.com/science/article/B6V64-44XCB5M-2/2/6a6fe9ca92b4999e11b262afdb046e28> .
Section 2.2.
3. Shogren, J. F., and L. O. Taylor. 2008. On Behavioral-Environmental Economics. *Review of Environmental Economics and Policy* 2 (1): 26-44. (Optional)
4. *Cooper, B. 1999. Chasing After the Wind: the Pursuit of Happiness Through Economic Progress. *Kategoria* (13): 4-12. (Please disregard the religious element)
5. *Brekke, K. A., R. B. Howarth, and K. Nyborg. 2003. Status-Seeking and Material Affluence: Evaluating the Hirsch Hypothesis. *Ecological Economics* 45 (1): 29-39.

Ecosystem models

Week 8: (Oct. 15)

Fisheries models: the traditional approach

1. Perman Chapter 17: "Renewable Resources" (more technical)
2. Hackett pp 88-106
3. Daly Chapters 6 and 12
4. *Imeson, R. J., and J. C. J. M. v. d. Bergh. 2006. Policy failure and stakeholder dissatisfaction in complex ecosystem management: The case of the Dutch Wadden Sea shellfishery. *Ecological Economics* 56: 488– 507.

Week 9: (Oct. 22) Biodiversity

1. *Nunes, P. A. L. D., and J. C. J. M. van den Bergh. 2001. Economic valuation of biodiversity: sense or nonsense? *Ecological Economics* 39 (2): 203 – 222.
2. *Heal, G. 2002. Globalization and Biodiversity. Social Science Research Network Publication
http://papers.ssrn.com/sol3/delivery.cfm/SSRN_ID355141_code021219670.pdf?abstractid=355141.
3. Christie, M., N. Hanley, J. Warren, K. Murphy, R. Wright, and T. Hyde. 2006. Valuing the diversity of biodiversity. *Ecological Economics* 58: 304– 317 (Optional)

4. Costanza, R., H. Daly, C. Folke, P. Hawken, C. S. Holling, A. J. McMichael, D. Pimentel, and D. Rapport. 2000. Managing our Environmental Portfolio. *Bioscience* 50 (2): 149 – 55 (Optional)
5. Hanley, N., J. Shogren, and B. White. 2001. Biodiversity. Pages 294-315. *Introduction to Environmental Economics*. Oxford University Press, New York (Less technical).

Week 10: (Oct. 29) Stern Report Technical Details

Week 11: (Nov. 5) Ecosystem Services and Valuation

1. *Limburg, K. E., R. V. O'Neill, R. Costanza, and S. Farber. 2002. Complex systems and valuation. *Ecological Economics* 41 (3): 409-420
2. *Farber, S., M. A. Wilson, and R. Costanza. 2002. Economic and ecological concepts for valuing ecosystem services. *Ecological Economics* 41 (3): 375-392.
3. *Constanza, R., R. d'Arge, R. d. Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R. G. R. Suttonkk, and M. v. d. Belt. 1997. The Value of the World's Ecosystem Services and Natural Capital. *Nature* 387 (6630): 253-59.
4. Brander, L. M., R. J. G. M. Florax, and J. E. Vermaat. 2006. The Empirics of Wetland Valuation: A Comprehensive Summary and a Meta-Analysis of the Literature. *Environmental and Resource Economics* 33: 223–250 (Optional)

Week 12: (Nov 12) Spatial economics and ecosystem management

1. Parker, D. 2007. Revealing "Space" in Spatial Externalities: Edge-Effect Externalities and Spatial Incentives. *Journal of Environmental Economics and Management* 54 (1): 84-99.
2. Robinson, E. J. Z., H. J. Albers, and J. C. Williams. 2005. Analyzing the Impact of Excluding Rural People from Protected Forests: Spatial Resource Degradation and Rural Welfare. (Optional)
3. *Swallow, S. K. 1996. Economic Issues in Ecosystem Management: An Introduction and Overview. *Agricultural and Resource Economics Review* 25 (2): 83-100.
<http://agecon.lib.umn.edu/cgi-bin/detailview.pl?paperid=2938>.
4. Grazia, F., and J. C. J. M. v. d. Bergh. 2008. Spatial organization, transport, and climate change: Comparing instruments of spatial planning and policy *Ecological Economics* In Press. (Optional)

Week 13: (Nov. 19) **Term Papers Due** Student term paper presentations, week 1.

Week 14: (Nov. 26) Thanksgiving holiday, no class

Week 15: (Dec. 3) Student term paper presentations, week 2. Final exam distributed.

Week 16: (Dec. 10) Final Exam Due, 7:10 PM