Department of Agricultural and Resource Economics
University of California at Berkeley

ARE 261
Peter Berck
Christian Traeger
Fall Semester, 2011

ENVIRONMENTAL AND RESOURCE ECONOMICS

Reading List for "Traeger Part" of the Lecture

Books on Reserve

N. Hanley, J.F. Shogren, and B. White, Environmental Economics in Theory and Practice. Palgrave Macmillan, 2nd edition 2007.

J.M. Conrad and C.W. Clark. *Natural Resource Economics*. Cambridge: Cambridge University Press, 1987.

R. Perman, Y. Ma, J. Mc Gilvray, M. Common. Natural Resource and Environmental Economics. Pearson, 3rd edition 2003.

1. Dynamic Optimization and Stock Pollutants: This section is an introduction to optimal control theory (or Pontryagin's maximum principle). We will apply the theory to a simple stock pollutant problem.

*Lecture Notes

J.M. Conrad and C.W. Clark. *Natural Resource Economics*. Cambridge: Cambridge University Press, 1987, Chapter 1.

M. Kamien and N. Schwartz, *Dynamic Optimization*, North Holland, 1991, part II, sections 1 – 9.

Seierstad and Sydsæter. *Optimal Control Theory With Economic Applications*, North-Holland, 1987.

A.C. Chiang, *Elements of Dynamic Optimization*, McGraw Hill, 1999, chapters 7 – 9.

I. Falk and R. Mendelsohn (1993), "The Economics of Controlling Stock Pollutants: An Efficient Strategy for Greenhouse Gases", Journal of Environmental Economics and Management: 25, pages 76-88.

U. Moslener and T. Requate (2007), "Optimal abatement in dynamic multi-pollutant problems when pollutants can be complements or substitutes". Journal of Economic Dynamics and Control: 31(7), Pages 2293-2316.

M. Hoel and L. Karp (2002), Taxes versus quotas for a stock pollutant, Resource and Energy Economcis 24: 367-384.

R. Newell and W. Pizer (2003), Regulating stock externalities under uncertainty, Journal of Environmental Economics and Management 45: 416-432.

T. Goeschl and G. Perino (2007), "Innovation without magic bullets: Stock pollution and R&D sequences." Journal of Environmental Economics and Management, Vol. 54(2), Pages 146-161

P. Dasgupta, P. Hammond and E. Maskin (1980), On imperfect information and optimal pollution control, Review of Economics Studies 47, 857-860.

P. Dasgupta and K.G. Maler (2003), The Economics of Non-Convex Ecosystems: Introduction, Environmental and Resource Economics 26: 499–525.

2. Nonrenewable Resources: This section treats socially optimal resource extraction as well as extraction under different market structures. It briefly discusses the green paradox.

*N. Hanley, J. Shogren, and B. White. *Environmental Economics in Theory and Practice*, 2nd Edition. Palgrave/Macmillan, 2007, Chapter 7, Chapter 8.

J.M. Conrad and C.W. Clark. *Natural Resource Economics*. Cambridge: Cambridge University Press, 1987, Chapter 3.

G. Gaudet (2007). "Natural resource economics under the rule of Hotelling". *Canadian Journal of Economics 40:* 1033-1059.

G. Gaudet and A.M. Khadr (1991). "The Evolution of Natural Resource Prices under Stochastic Investment Opportunities - An Intertemporal Asset-Pricing Approach." International Economic Review 32(2): 441-455.

R. Gerlagh (2011), "Too much oil", CESifo Economic Studies 57: 79-102.

R. Gerlagh and M. Liski (2011), "Strategic Resource Dependence." Journal of Economic Theory 146(2): 699-727.

M. Hoel (2009), "Bush meets Hotelling: E¤ects of improved renewable energy technology on greenhouse gas emissions." CESifo Working Paper 2492.

HW Sinn (2008), "Public policies against global warming: a supply side approach", International tax and public finance 15: 360-394.

R.M. Solow (1974), "Richard T. Ely Lecture: The Economics of Resources or the Resources of Economics." *American Economic Review*, No. 64, pp. 1-14.

X R. M. Solow (1974), "Intergenerational Equity and Exhaustible Resources." Review of Economic Studies, 41: 29–46.

R.M. Solow and F.Y. Wan. 1976. Extraction costs in the theory of exhaustible resources. Bell Journal of Economics 7, 359-370.

P. Berck and M. Roberts (1996), "Natural Resource Prices: Will They Ever Turn Up?" *Journal of Environmental Economics and Management*, Vol. 30, pp. 65-78.

M.H. Miller and C.W. Upton (1985), "A Test of the Hotelling Valuation Principle." *Journal of Political Economy*, No. 93, pp. 1-25.

R. Halvorsen and T.R. Smith (1991), "A Test of the Theory of Exhaustible Resources." *The Quarterly Journal of Economics*, pp. 123-140.

C. Withagen (1998), "Untested Hypotheses in Non-Renewable Resource Economics." *Environmental and Resource Economics*, Vol. 11, pp. 623-634.

3. Uncertainty, Learning, and Option Value: This section analyzes how uncertainty and learning affect optimal extraction or emissions in a simple two period framework.

*Lecture Notes

C. Gollier, B. Julien, and N. Treich. "Scientific Progress and Irreversibility: An Economic Interpretation of the Precautionary Principle." *Journal of Public Economics*, Vol. 75 (2000), pp. 229-253.

C. Gollier and N. Treich. "Decision-Making Under Scientific Uncertainty: The Economics of the Precautionary Principle." *Journal of Risk and Uncertainty*, Vol. 27 (2003), pp. 77-103.

F. Salanie and N. Treich, "Option Value and Flexibility: A General Theorem with Applications". Working Paper (2007)

L. Eeckhoudt and H. Schlesinger. "Putting Risk in Its Proper Place." *American Economic Review*, Vol. 96 (2006), pp. 280-289.

L. Epstein. "Decision Making and the Temporal Resolution of Uncertainty." *International Economic Review*, Vol. 21 (1980), pp. 269-283.

K.J. Arrow and A.C. Fisher. "Environmental Preservation, Uncertainty, and Irreversibility." *Quarterly Journal of Economics*, Vol. 88 (1974), pp. 312-319.

W.M. Hanemann. "Information and the Concept of Option Value." *Journal of Environmental Economics and Management*, Vol. 16 (1989), pp. 23-37.

A.K. Dixit and R.S. Pindyck. *Investment Under Uncertainty*. Princeton University Press, 1994, Chapters 1-2.

R.S. Pindyck. "Optimal Timing Problems in Environmental Economics." *Journal of Economic Dynamics & Control*, Vol. 26 (2002), pp. 1677-1697.

R.S. Pindyck. "Uncertainty in Environmental Economics." *Review of Environmental Economics and Policy*, Vol. 1 (2007), pp. 45-65.

A. Vercelli. "Hard Uncertainty and Environmental Policy." In Chichilnisky, Heal, and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*. Springer, 1998.

4. Integrated Assessment of Climate Change: This section discusses models of economic growth that integrate climate change. Following a brief discussion of climate change per se, we discuss Nordhaus' open source integrated assessment model DICE.

*IPCC. "Climate Change 2007: The Physical Science Basis," Summary for Policymakers. *Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change*, Working Group I, 2007a.

W.D. Nordhaus. "*A Question of Balance: Weighing the Options on Global Warming Policies*, Yale University Press, New Haven, CT, 2008.

N. Stern et al. "*Stern Review on the Economics of Climate Change."* HM Treasury, 2007.

Online Sources on Different Integrated Assessment Models:
DICE: http://nordhaus.econ.yale.edu/DICE2007.htm
FUND: http://www.mi.uni-hamburg.de/FUND.5679.0.html
WITCH: http://www.witchmodel.org/pag/model.html
Model survey: http://www.metasd.com/ModelSurvey.xml

IPCC. "Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability," Summary for Policymakers. *Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change*, Working Group II, 2007b.

C.D. Kolstad and M. Toman. "The Economics of Climate Policy." In Mäler and Vincent (eds.) *Handbook of Environmental Economics*, Vol. 3, Elsevier, 2005, Chapter 30, Section 2: Overview of the Climate Change Issue.

D. Lemoine and C. Traeger (2010). "Tipping Points and Ambiguity in the Integrated Assessment of Climate Change". CUDARE Working Paper 1111.

5. Social Discounting and Distribution: The section introduces to the debate on the 'right' social discount rate in the context of climate change evaluation. It thereby relates to questions of sustainability, intergenerational justice, and evaluation under uncertainty.

* Lecture Notes

*W.D. Nordhaus. "A Review of the Stern Review on the Economics of Climate Change." *Journal of Economic Literature*, Vol. 45 (2007), pp. 703-724.

G. Asheim, "Intergenerational Equity", *Annual Review of Economics Vol. 2* (2010).

P. Dasgupta. "Commentary: The Stern Review's Economics of Climate Change." *National Institute Economic Review*, Vol. 199, No. 1 (2007), pp. 4-7.

C. Gollier and M. Weitzman. "How Should the Distant Future be Discounted when Discount Rates are Uncertain", *Economics Letters 107(3)*: 350-353.

B. Groom, C. Hepburn, P. Koundouri, and D. Pearce. "Declining Discount Rates: The Long and the Short of It." Environmental & Resource Economics, Vol. 32 (2005), pp. 445-493.

T. Sterner and U.M. Persson. "An Even Sterner Review: Introducing Relative Prices into the Discounting Debate", *Review of Environmental Economics and Policy*, Vol. 2 (2008), pp. 61–76.

C. Traeger, "Discounting and Confidence." CUDARE Working Paper No. 1117 (2010).

M.L. Weitzman. "Gamma Discounting." *American Economic Review*, Vol. 91 (2001), pp. 260-271.

M.L. Weitzman. "On Modeling and Interpreting the Economics of Catastrophic Climate Change," *Review of Economics and Statistics*: 91(1) (2009), pp. 1–19.

M.L. Weitzman. "A Review of the Stern Review on the Economics of Climate Change." *Journal of Economic Literature*, Vol. 45 (2007), pp. 703-724.

The second part of the lecture held by Peter Berck will cover

Lecture	Topic
1	Open Access
2	Open Access
3	Optimal Management of Non Renewable Resources
4	Conservation and Extinction
5	Forest Resources
6	Environmental Econmics: Classical Issues (types of regulation)
7	Environmental Economics: Classical Issues(Welfare, tax,etc)
8	Environmental Economics: Classical Issues (Coase)
9	Environmental Policy: The Laws
10	Optimal Tax and Double Dividend
11	Regulation Under Uncertainty and Monitoring/Enforcement
12	Garbage, Manure, Recycling
13	Automobiles, Gasoline, Pollution

More details and articles on this second part of the lecture can be found by starting from afs.berkeley.edu/~pberck