

Fall 2010—CIS 331
Seminar: Ecological Economics

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Tues./Thurs. 11:30-12:45
Chambers 1045

Office hours: Monday 10:30-12:00 & Thursday 9:30-11:00, or by appointment

“This is our work. To shift the world's economies away from their present emphasis on infinite economic growth and toward a focus on sustainable human wellbeing. To forge fresh and visionary approaches to the economic challenges and opportunities that await us”
–Gund Institute for Ecological Economics

“Ecological Economics is the science of sustainability.”
–U.S. Society for Ecological Economics

Despite vast accumulations of knowledge, environmental crises continue to mount. Human economies and natural systems have both been explored in great depth, but while global problems require unified, holistic approaches, our tendency has been to compartmentalize knowledge of these fields into discrete disciplines. Ecological economics endeavors to overcome this weakness—both by joining the disciplines of economics and ecology and by forcing its practitioners to question some of the primary assumptions that color disciplinary thinking. Mainstream economics, for instance, has long presumed that economic principles can be applied to the use of natural resources with predictable outcomes, and ecology has too often ignored the critical roles played by humans and their myriad economic motivations. Ecological economics challenges the foundation of these disciplinary approaches by placing the human economy squarely within the natural system—creating a new set of expectations that emphasizes both the importance of human-ecosystem interactions and the notion that the human economy is bound by the laws of nature.

This shift in thinking has tremendous implications for the way we approach environmental problems. By emphasizing the linkages between human economies and ecosystems, ecological economics stresses the importance of maintaining these systems in an integrated, balanced fashion. Thus, at its core, ecological economics is all about sustainability. As we develop the framework and principles of ecological economics and apply the insights of the field to a variety of issues, we'll always be coming back to the same fundamental question: How can we achieve both long-term ecological health *and* a just human economy?

As we work to answer that question, we'll explore the following (and much more):

- What distinguishes ecological economics from mainstream economics?
- Why should we question the goal of economic growth?
- How are human systems and ecosystems related?
- Are there physical limits to nature?
- What do alternative economic models look like?

There are no formal prerequisites for this course. However, independence, motivation, and dedication to critical analysis (including of your own views or assumptions) are a must. This course earns Social Science distribution credit, fulfills the Social Science requirement of the Environmental Studies Concentration, counts toward the Social Science track of the ENV major, and is open to sophomores and above.

Your grade in this seminar will be highly dependent on your participation and your interactions with the material. Points will be assigned according to the following distribution:

Meaningful participation in class discussion	15%
Leading discussion/presenting papers on assigned days	15%
Reading Reactions (2 questions + 1-2 pages, single spaced due ~every Tuesday)	40%
Research Project/Final Paper	30%

Participation (15%): All students are expected to 1) attend every class 2) prepare carefully (including completing the day's readings) 3) be ready to contribute in meaningful ways to class discussions and related activities. This portion of your grade will be based on your regular presence in class, demonstration of active listening and respect for your fellow classmates, and the *quality* (primarily) and *quantity* (secondarily) of your contributions. (That is, talking a lot without saying anything won't get you full points, but neither will saying something brilliant if we never hear from you again.)

Leading discussion/presenting papers (15%): You (and potentially a partner) will be assigned multiple days during the term for which you will be responsible for helping to guide discussion (including by generating questions in advance). You will also identify topics within that day's reading for which more information may be useful to the class, and research and present that information. You are encouraged to work with the professor (and your co-leader, if you have one) to identify topics and sources for presentation. An advance meeting with the professor will be required prior to your first day as a discussion leader. More details on this process will be provided in a separate assignment handout.

Reading Reactions (40%): Most weeks you'll be required to submit a 1-2 page, single spaced paper reacting to the week's readings, as well as 2 discussion questions you'd like to explore in class. These papers will be due at the start of class each Tuesday. Again, more details will be provided in a separate handout.

Research Project (30%): ~10-15 pages. Throughout the semester you'll be reading, thinking, and talking ecological economics. This is your chance to become a practitioner of ecological economics. Explore a topic of your choosing and put the concepts of ecological economics into action. For instance, you might do one or more of the following:

- apply concepts and lessons from the texts to a real world issue
- define a problem and explore its historical context
- evaluate and map out desirable alternatives
- investigate the most effective pressure points to leverage lasting change
- develop and communicate a vision for a sustainable course of action
- explore empirical data through an ecological economics lens

Late work policy: No credit will be given for late submission of discussion questions, nor will credit be given for late work associated with leading discussion. If you become ill and cannot attend class on a day you are scheduled to lead discussion you are expected to notify the professor as early as possible, and you should still make every reasonable attempt to submit your outline and questions prior to class time. For all other written work, extensions must be sought well in advance of the due date. If no extension is granted in advance, the assignment will be penalized ten percent immediately and an additional 10% for every 24 hours the work is delayed, including weekends, breaks, and holidays.

Students with disabilities: I am happy to accommodate students with learning or physical disabilities. Please identify yourself and have Davidson College provide the appropriate documentation.

The HONOR CODE is one of Davidson's most cherished institutions. Let's keep it that way! If you have *any* questions about documentation, what constitutes plagiarism, or any other Honor Code related questions, please ask immediately.

Required texts:

Czech, Brian. 2000. *Shoveling Fuel for a Runaway Train: Errant Economists, Shameful Spenders, and a Plan to Stop Them All*. Berkeley: University of California Press.

Jackson, Tim. 2009. *Prosperity Without Growth: Economics for a Finite Planet*. London: Earthscan.

Optional text:

Daly, Herman and Joshua Farley. 2003. *Ecological Economics: Principles and Applications*. Washington DC: Island Press. (1st or 2nd edition)

(Additional required readings are available on blackboard. References for these readings are at the end of the syllabus.)

Week 1

Aug. 24 Syllabus, Introductions. Where are we going, why are you here, and what do you know?

— **PART I: What IS ecological economics, anyhow?** —

Aug. 26 Pre-analytic visions for ecological economics

Ropke 2005—“Trends in the development of ecological economics...” (sections 1-4, 6.4)

Costanza & Daly 1987—“Toward an ecological economics”

Martin 2006—“The preanalytic visions of environmental economics and ecological economics....”

Week 2

Aug. 31 Setting the Stage: Identifying key issues, directions, etc.

Aronson *et al.* 2010—“The road to sustainability must bridge three great divides”

Luzadis *et al.* 2010—“The science of ecological economics: a content analysis...”

Sept. 2 Historical Foundations Part I

Mill 1909 —“Of the stationary state”

Boulding 1966—“The economics of the coming spaceship earth”

Schumacher 1973—“Buddhist economics”

Week 3

Sept. 7 Historical Foundations Part II

Georgescu-Roegen 1975—“Energy and economic myths”

Vitousek *et al.* 1986—“Human appropriation of the products of photosynthesis”

— **PART II: Valuation and Decision-Making in Ecological Economics** —

Sept. 9 Introduction to Valuation and Decision-Making

Ropke 2005—“Trends in the development of ecological economics...” (section 6.3)

Costanza 2001b—“Visions, values, valuation, and the need for an ecological economics”

Costanza *et al.* 1997—“Valuation, choice, and uncertainty” (Ch. 3.6 of Costanza *et al.* 1997)

Week 4

Sept. 14 Ecosystem Services Valuation: Background

Liu *et al.* 2010—“Valuing ecosystem services...” (selections)

Patel 2010—“We have yet to see the biggest costs of the BP spill”

Sept. 16 Ecosystem Services Valuation: The Costanza Classic

Costanza *et al.* 1997—“The value of the world’s ecosystem services and natural capital”

Bockstael *et al.* 2000—“On measuring economic values for nature”

Turner *et al.* 1998—“Ecosystem services value, research needs, and policy relevance...”

Costanza *et al.* 1998—“The value of ecosystem services: putting the issues in perspective”

Week 5

Sept. 21 The Economic Case for Conservation and the Problem of Perverse Subsidies

Balmford *et al.* 2002—“Economic reasons for conserving wild nature”

James *et al.* 1999—“Balancing the Earth’s accounts”

Costanza 2001a—“Government sponsored perversity”

Myers 1998—“Lifting the veil on perverse subsidies”

Sept. 23 Payments for Environmental Services: REDD

- Parker *et al.* 2008—"The little REDD book" (selections)
Pearce 2008—"Do trees grow on money?"
Laurance 2008—"Can carbon trading save vanishing forests?"
Harvey *et al.* 2010—"Opportunities for achieving biodiversity conservation through REDD"
Sandker *et al.* 2010—"REDD payments as incentives for reducing forest loss"
Butler *et al.* 2009—"REDD in the red: palm oil could undermine carbon payment schemes"
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Week 6

— PART III: Issues of Scale —

Sept. 28 Definitions of Sustainability

- Arrow *et al.* 1995—"Economic growth, carrying capacity, and the environment"
White House 1993—"...President creates council on sustainable development"
Solow 1993—"An almost practical step toward sustainability"
Brundtland 1987—"Towards sustainable development"
Daly 1991b—"Towards an environmental macroeconomics"

Sept. 30 Resilience Thinking

- Holling & Walker 2003—"Resilience defined"
Levin *et al.* 1998—"Resilience in natural and socioeconomic systems"
Rockström *et al.* 2009—"A safe operating space for humanity"
Foley *et al.* 2005—"Global consequences of land use"
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Week 7

Oct. 5 Beyond Carrying Capacity: the Drivers of Human Environmental Impacts

- Daily & Ehrlich 1992—"Population, sustainability, and Earth's carrying capacity"
Waggoner & Ausubel 2002—"A framework for sustainability science: a renovated IPAT identity"
Schulze 2002—"I=PBAT"
de Groot & Steg 2009—"Mean or green: which values can promote stable pro-environmental behavior"

Oct. 7 Measuring Human Impacts: the Ecological Footprint

- Rees 2002—"Is humanity fatally successful?"
Wackernagel & Rees 1996—"Ecological footprints for beginners", "Footprints and sustainability"
Diamond 2005—"Tikopia"
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Week 8

Oct. 12 No classes. FALL BREAK

Oct. 14 Consumption: Trends, Trade, and the EKC

- Rothman 1998—"Environmental Kuznets curves—real progress or passing the buck?"
Mills & Waite 2009—"Economic prosperity, biodiversity conservation, and the EKC"
****RESEARCH PROJECT ASSIGNED ** Midterm Evaluations**
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Week 9

Oct. 19 Where Do We Stand Today?

- Living Planet Report 2010 (available October 2010)
Dietz *et al.* 2007—"Driving the human ecological footprint"
Myers & Kent 2003—"New consumers: the influence of affluence on the environment"

— **PART IV: Economic Growth & Sustainability: Fundamental Conflict or Happy Convergence?** —

Oct. 21 Economic Growth as Goal: Part I
Czech 2000—“Shoveling fuel for a runaway train” Prologue, Chapters 1 & 2

Week 10

Oct. 26 Economic Growth as Goal: Part II
Czech 2000—Chapters 3 & 4

Oct. 28 What is Prosperity?
Jackson 2009—“Prosperity without growth” Chapters 1, 2, & 3

Week 11

Nov. 2 Alternate Measures of Well-Being
England 1998—“Measurement of social well-being: alternatives to gross domestic product”
Talberth 2008—“A new bottom line for progress”
NEF 2009—“The Happy Planet Index 2.0: Why good lives don’t have to cost the Earth” (sections 5 & 6)

Nov. 4 The Dilemma of Growth and the Myth of Decoupling
Jackson 2009—Chapters 4 & 5
****ANNOTATED BIBLIOGRAPHY DUE by class time**

Week 12

Nov. 9 Win-Win Solutions? Reconciliation Ecology and Cradle-to-Cradle Philosophy
Rosenzweig 2003—“Reconciliation Ecology”
McDonough & Braungart 2002—“Eco-effectiveness”, “Waste Equals Food”

Nov. 11 Can Technology Save Us?
Jackson 2009—Chapter 6
Czech 2008—“Prospects for reconciling the conflict...with technological progress”
Glucina & Mayumi 2010—“Connecting thermodynamics and economics”

Week 13

— **PART V: Alternatives to Growth** —

Nov. 16 Ecological Macroeconomics
Jackson 2009—Chapter 8
Victor & Rosenbluth 2007—“Managing without growth”

Nov. 18 Flourishing Within Limits: The Steady State Economy
Daly 1993b—“The steady-state economy...”
Daly 1993a—“Postscript: some common misunderstandings and further issues...”
Daly 1991a—“Scarcity, wants, and the SSE”
Daly 2009—“From a failed growth economy to a steady-state economy”

Week 14

Nov. 23 Project Work Day

Nov. 25 No classes. THANKSGIVING BREAK

Week 15

Nov. 30 You Say You Want a Revolution?

Czech 2000—Part 2 (Chapter 6 to the end)

Dec. 2 Settling into a Lasting Prosperity

Jackson 2009—Chapters 10, 11, & 12

****DRAFT MEETINGS MUST BE COMPLETED by Friday, Dec. 3 @ 5pm**

Week 16

Dec. 7 Project Sharing and Wrap-Up

****RESEARCH PROJECTS DUE by start of class**

References for required articles

- Aronson, James, James N. Blignaut, Rudolf S. de Groot, Andre Clewell, Porter P. Lowry II, Paddy Woodworth, Richard M. Cowling, Daniel Renison, Joshua Farley, Christelle Fontaine, David Tongway, Samuel Levy, Suzanne J. Milton, Orlando Rangel, Bev Debrincat, and Chris Birkinshaw. 2010. The road to sustainability must bridge three great divides. *Annals of the New York Academy of Sciences* 1185: 225-236.
- Arrow, Kenneth, Bert Bolin, Robert Costanza, Partha Dasgupta, Carl Folke, C.S. Holling, Bengt-Owe Jansson, Simon Levin, Karl-Göran Mäler, Charles Perrings, and David Pimentel. 1995. Economic growth, carrying capacity, and the environment. *Science* 268(28 April):520-521.
- Balmford, Andrew, Aaron Bruner, Philip Cooper, Robert Costanza, Stephen Farber, Rhys E. Green, Martin Jenkins, Paul Jefferiss, Valma Jessamy, Josh Madden, Kat Munro, Norman Myers, Shahid Naeem, Jouni Paavola, Matthew Rayment, Sergio Rosendo, Joan Roughgarden, Kate Trumper, and R. Kerry Turner. 2002. Economic reasons for conserving wild nature. *Science* 297(9 August):950-953.
- Bockstael, N.E., A. Myrick Freeman III, Raymond J. Kopp, Paul R. Portnery, and V. Kerry Smith. 2000. On measuring economic values for nature. *Environmental Science and Technology* 34:1384-1389.
- Boulding, Kenneth E. 1966. The economics of the coming spaceship Earth. In *Environmental Quality in a Growing Economy*, edited by H. Jarrett, 3-14. Baltimore, MD: Resources for the Future.
- Butler, Rhett, Lian Pin Koh, and Jaboury Ghazoul. 2009. REDD in the red: palm oil could undermine carbon payment schemes. *Conservation Letters* 2:67-73.
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- Costanza, Robert. 2001a. Government-sponsored perversity. *BioScience* 51(5):408-410.
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- Costanza, Robert, John Cumberland, Herman Daly, Robert Goodland, and Richard Norgaard. 1997. Valuation, Choice, and Uncertainty. *An Introduction to Ecological Economics*, 140-155. Boca Raton, Florida: St. Lucie Press.
- Costanza, Robert, Ralph d'Arge, Rudolph de Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahid Naeem, Robert V. O'Neill, Jose Paruelo, Robert G. Raskin, Paul Sutton, and Marjan van den Belt. 1997. The value of the world's ecosystem services and natural capital. *Nature* 387(15 May):253-259.
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- Czech, Brian. 2008. Prospects for reconciling the conflict between economic growth and biodiversity conservation with technological progress. *Conservation Biology* 22(6):1389-1398.
- Daily, Gretchen C., and Paul R. Ehrlich. 1992. Population, Sustainability, and Earth's carrying capacity: a framework for estimating population sizes and lifestyles that could be sustained without undermining future generations. *BioScience* 42(10):761-771.
- Daly, Herman E. 1991a. *Steady State Economics: Second Edition with New Essays*. Washington, DC: Island Press.
- Daly, Herman E. 1991b. Towards an environmental macroeconomics. *Land Economics* 67(2):255-259.
- Daly, Herman E. 1993a. Postscript: some common misunderstandings and further issues concerning a steady-state economy. In *Valuing the Earth: Economics, Ecology, Ethics*, edited by Herman Daly & Kenneth Townsend, 365-382. Cambridge, MA: MIT Press.
- Daly, Herman E. 1993b. The steady-state economy: toward a political economy of biophysical equilibrium and moral growth. In *Valuing the Earth: Economics, Ecology, Ethics*, edited by Herman Daly & Kenneth Townsend, 325-363. Cambridge, MA: MIT Press.
- Daly, Herman E. 2009. From a failed growth economy to a steady-state economy. Keynote Address: United States Society for Ecological Economics 5th Bi- Annual Conference, American University, Washington D.C., June 1, 2009.
- de Groot, Judith I.M., and Linda Steg. 2009. Mean or green: which values can promote stable pro-environment behavior? *Conservation Letters* 2:61-66.
- Diamond, Jared. 2005. *Tikopia. Collapse: How Societies Choose to Fail or Succeed*, 286-293. New York: Penguin.
- Dietz, Thomas, Eugene A. Rosa, and Richard York. 2007. Driving the human ecological footprint. *Frontiers in Ecology and Environment* 5(1):13-18.
- England, Richard W. 1998. Measurement of social well-being: alternatives to gross domestic product. *Ecological Economics* 25:89-103.
- Foley, Jonathan A., Ruth DeFries, Gregory P. Asner, Carol Barford, Gordon Bonan, Stephen R. Carpenter, F. Stuart Chapin, Michael T. Coe, Gretchen C. Daily, Holly K. Gibbs, Joseph H. Helkowski, Tracey Holloway, Erica A. Howard, Christopher J. Kucharik, Chad Monfreda, Jonathan A. Patz, I. Colin Prentice, Navin Ramankutty, and Peter K. Snyder. 2005. Global consequences of land use. *Science* 309(22 July):570-574.
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