Famous Quotes:

"In economic terms, the belief seems to be that natural resources are scarce; that the scarcity increases with time; and that resource scarcity impairs levels of living and economic growth... But in our view, these propositions are neither self-evident nor easy to formulate in meaningful terms." (Barnett & Morse, p. 49).

"For if growth and welfare are inescapably subject to an economic law of diminishing returns, the necessary social policies and the moral and human implications are surely different than if they are not." (Barnett & Morse, p. 3).

Concern with natural resource scarcity existed before the industrial revolution, mainly in connection with the cutting of forests and the consequent shortage of building materials and fuel. Technological change of many forms has helped avert serious shortages, but the environmental consequences of resource exploitation have become the major problem. Problems have become global in scope, from global warming to global exhaustion of marine fish stocks.

In this seminar, we will trace some of this history, addressing the nature & measurement of natural resource scarcity and its consequences for society. To a large degree, natural resource economics is about "sustainability", a current buzz word involving stretching the use of our resources and finding ways of protecting the potential well being of future generations. Any serious study of sustainability must involve various disciplines. Economics is only a part of the needed analytical apparatus.

This is a Ph.D. level seminar. The purpose of 8000-level seminars is to investigate current and even frontier topics in the field. Another major purpose here at C.U. is to provide an opportunity for the Ph.D. candidate to try a research topic that could serve as a Ph.D. dissertation. All participants are urged to look upon their research paper in this way--as a likely start on their dissertation. Grading in the seminar--especially on the research paper--will be based on those assumptions.

There will be a comprehensive final exam on the topics below, counting 40% of the grade. The research paper will count 40% of the grade, and class participation 20%. Class participation, based on adequate preparation, is important and is expected. Selection of research topic must be discussed with and approved by Professor Howe. Timing of selection of a research topic poses a dilemma: one would like to know everything before committing to a topic, but a quality paper cannot be researched and written in 2 or 3 weeks. It is assumed that you have some background and deep interest in this field, perhaps some deeply felt conservation issue. Topics should be selected by mid-semester and papers completed.
before classes end. Each class member will give an oral report on their paper to the class. Teams of class members will also make class presentations on selected topics in the outline below.

Text materials are found in 2 identical packets of readings on reserve in the Geological Sciences Library - 2 hour plus overnight reserve.

Classics in the field:


Useful References:


Data Sources:


Major Journals in the Field:

Journal of Environmental Economics and Management (JEEM), Academic Press, USA.

Environmental and Resource Economics, Kluwer, USA and The Netherlands.
Natural Resources Journal, The University of New Mexico School of Law.

Land Economics, University of Wisconsin.

American Journal of Agricultural Economics

Water Resources Research, American Geophysical Union.

International Journal of Water Resources Development, Butterworth, USA and UK.

Resources and Energy, North Holland.


Natural Resources Forum (A United Nations Journal), Butterworth, USA and UK.

Energy Economics, Butterworth, USA and UK.

Resources Policy, Butterworth, USA and UK.

**Beginning and Intermediate Level Texts:**


**General Bibliography on Natural Resources and Environment:**

The reading packet contains an excellent taxonomy of issues in the NR/E area with corresponding bibliography. This was assembled by Porter Hoagland (Woods Hole) and Rob Stavins (The Kennedy School, Harvard). It is recommended that you copy this for your professional files.
Course Outline and Readings

Topic 1: Background & the History of Natural Resource Concern

a. Overview & Natural Resource Production. Howe 1, 2.
c. Factors Mitigating NR Scarcity Howe 7, Rosenberg

Topic 2: Models & Measures of Natural Resource Scarcity

a. Technical, Economic & Legal Considerations. Howe, "Environment & Primary Activities"
b. The Hotelling Model: Introduction Howe, Notes and Problems 1 and 2. Devarajan & Fisher Solow, "The Economics of Resources or the Resources of Economics"

Topic 3: Dynamics of Renewable Resources.

a. Howe: Notes on basic fisheries model.
b. Vernon Smith: "Economics of Production from Natural Resources".
c. Howe, Chap. 11, "Economics of Forest Management".
d. Hyde, "Timber Economics in the Rockies: Efficiency & Management Options".
e. Howe, Chap. 14, "Water Resource Systems"
f. Howe, "Water Marketing in the Western United States....".
g. Scheraga, "Energy & the Environment".

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Topic 4: Issues in Sustainability.

a. Property Rights.
   i) Demsetz, "Towards A Theory of Property Rights"
   ii) Randall, "Property Rights, Efficiency & the Distribution of Income"
   iii) Howe & Salles, "Modifying Appropriations Doctrine to Protect Public Values" (in progress)
   iv) Howe, Chap. 12, "Common Property Resources...."

b. Conservation, Markets & Sustainability.
   i) Krutilla, "Conservation Reconsidered"
   ii) Johnson & Libecap, "Efficient Markets and Great Lakes Timber..."

c. Sustainability: Theory & Practice.
   i) Hartwick, "Intergenerational Equity and the Investing of Rents from Exhaustible Resources"
   ii) Toman, Pezzey & Krautkraemer, "Neoclassical Economic Growth Theory & Sustainability"
   iii) Howe, "Intergenerational Equity, Sustainability & Economic Efficiency: New Paradigms and Old Prescriptions"
   iv) Kennedy, "Rethinking Sustainability"
   v) Solow, Polasky & Broadus, "On the Measurement of Biological Diversity"
   vi) Brown & Goldstein, "A Model for Valuing Endangered Species"

d. Global Warming, Green Accounts, and Natural Hazards
   i) Schelling, "Some Economics of Global Warming"
   ii) Repetto, "Balance Sheet: Incorporating Natural Resources in Natural Income Accounts"
   iii) Arvan & Nickerson, "Public Insurance Programs, Disaster Relief and Optimal Government Policy: A Samaritan's Dilemma Game".