Description
The first objective of this course is to help students understand why natural resources are often misused. To this end, we introduce the concepts of rents and property rights as fundamental determinants of conflict and cooperation over resource use. This leads us to discuss the importance of transaction costs in explaining the success or failure of institutions. The approach intends to be relevant for both developed and developing economies, as well as historical accounts.

We begin by pinning down user incentives responsible for inefficient resource use. We then look at factors that may impede actions to redress the situation at either the community or state levels. This approach builds on the interplay between rule adoption, economic behavior and transaction costs. For this reason, game theory provides us with powerful analytical tools. Political-economic issues of cooperation, conflict and redistribution are recurrent themes.

We initially consider static models of resource use under simple institutional arrangements. This approach helps apprehend the fundamental role played by institutions, and some policy implications. Dynamic stock-flow models of natural-resource use are then introduced with elements of dynamic optimization methods and financial concepts. More sophisticated institutional arrangements are also discussed. We consider explicitly the cases of fisheries and non-renewable resources, such as minerals and oil deposits. Extensions to other types of resources, such as water, forest, game, land or pastures, are introduced along the way.

General reference:
In the past, I have not made use of a specific general reference textbook because I could not find one that fitted with the topics and technical level that I sought for this course. However, Larry Karp (2017) just wrote a textbook that covers a lot of material similar to mine and with roughly the same technical level. So we might be referring to it at times as a trial this year.

Evaluation
There will be two mid-term (2 hours) and one final (3 hours) examinations, with weights of 20% and 40% respectively. Unless otherwise noted, mid-term examinations will take place on Tuesdays January 30th and February 27th. The date for the final exam will be
determined by the Faculty. The final exam is cumulative.

Although a course in natural-resource economics can be somewhat technical, it remains a course in economics as a social science. Much emphasis is thus put on interpreting the results and discussing their implications for society and economic policy. The evaluation will reflect this.

The ability to interpret and discuss results can only be properly achieved through long-term maturation of ideas. Students are thus expected to be up-to-date in their weekly material. To this end, exercises and readings will be assigned every week. An individual and hand-written copy of the answers to exercises is to be submitted the following week in person at class break. Detailed solutions will then be provided but individual copies will not be corrected in detail. I will look only at honest attempts to solve and interpret the problems. It goes without saying that class attendance is mandatory; missing more than two classes or two classes in a row is not acceptable. Assiduous attendance and assignment completion will make up for the last 20%.

THEMES

A. Property arrangements and resource use: An introduction to the main issues

1. Review: Elements of game theory (Varian 1992, 15.1 to 15.4)
2. Natural resources and scarcity rents
   i. Land quality (Hartwick and Olewiler 1998, ch 3)
   ii. A non-renewable resource with two periods
4. Transaction costs (Coase, 1960; Coleman, 1990, chap. 3)
   i. Political economy of property arrangements
   ii. Privatization with Transaction Costs: Reconsidering efficiency and its persistence

B. The dynamics of resource use

1. The economics of the fishery

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1Themes, readings, references, and their timing are subject to change.
i. Steady-State Analysis (Perman, Ma, McGilvray and Common 2003, ch 17) (Hartwick and Olewiler 1998, ch 4)(Pearce and Turner 1990, ch 17)

ii. The Industry Supply Curve (Hartwick and Olewiler 1998, ch 4)


iv. Fishery dynamics and present-value maximizing in discrete time (Hartwick and Olewiler 1998, ch 11)


vi. Fishery dynamics and present-value maximizing in continuous time (Perman et al. 2003, ch 17)


   i. A basic two-period model
   ii. The T-period problem in discrete time
   iii. The social optimum with rising prices
   iv. The competitive mineral industry
   v. Continuous-time analysis

3. The Economics of Forest and Water Resources (if time permits)

C. Additional topics

(a) Review: Elements of Game theory (Varian 1992, 15.4 (mixed strategy) to 15.6, 15.10, 15.11)


   i. Examples of CPR problems(Libecap and Wiggins 1984)
   ii. A taxonomy of property regimes based on transaction costs
   iii. The repeated PD game
   iv. Alternatives to the PD game structure

i. Heterogeneous users
ii. Terminal period
iii. Reputation


(h) Sustainable Development

References


Hardin, Garrett (1968) ‘The tragedy of the commons.’ *Science* 162, 1243–1248


Humphreys, Macartan (2005) ‘Natural resources, conflict, and conflict resolution: Uncovering the mechanisms.’ *Journal of Conflict Resolution* 49, 508–537


