

**Natural Resource Economics**  
**AAE/Econ/Forest Ecol/531**  
**Spring 2017**

**Instructor:**

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**Class Meetings:**

Tuesday and Thursday, 4:00 – 5:15 p.m., Agriculture Hall 10

**Office Hours:**

Wednesday 2-3pm, Friday 9-10am, or by appointment.

**Class Website:**

We will use Learn@UW. Check regularly for announcements, readings, assignments, etc.

**Course Description:**

The course will introduce the concepts, tools, and methods of natural resource economics. Examples of concepts include *commons*, *anticommons*, *steady state*, *maximum sustained yield*, *discounting*, and the *rule of capture*. Examples of tools include analytical models of optimal control and numerical simulation. We will use calculus, algebra, and Microsoft Excel to solve problems, and economic intuition to interpret the results.

The course will apply the methodologies and tools towards the study of land use, wind, water, minerals, fossil fuels, fisheries, and wildlife. As we will see, the efficient management of each type of resource depends on real-world conditions related to resource scarcity and the extent to which property rights to resources are defined and enforced. In the case of renewable resources, growth rates and/or recharge rates also play an important role. The course applications will mix economic modeling and problem solving with practical readings and some basic statistical exercises. We will examine how the economic and ecological benefits from natural resources are captured under some government policies and dissipated under others.

Natural Resource Economics is a class in economic theory, so you can expect math and a lot of diagrams, abstractions, and simplifications. But the purpose of theory is to help understand the real world. *Note: Economics 301 (Intermediate Microeconomic Theory) and Math 211 (Calculus) are prerequisites to this class.*

**Primary Text:**

There is no required text, but you might find it useful to own the following books.

Conrad, Jon M. 2010. *Resource Economics* (2<sup>nd</sup> Edition). Cambridge University Press.  
(a Master's level treatment of traditional resource topics).

Field, Barry C. 2008. *Natural Resource Economics, an Introduction*. Waveland Press.  
(an introductory level treatment of a large-range of resource topics).

**Supplementary Readings:**

There will be some supplementary readings; these will be a mix of journal articles and short policy arguments.

**Grading:**

Problem Sets 5 @ 10 points	50 pts
Quizzes 5 @ 10 points	50
Group Presentation	25
Essay	25
<u>Final exam</u>	<u>50</u>
<b>Total</b>	<b>200 pts</b>

**Problem Sets:**

The problems sets will be due approximately every third week. You can work on these together in small groups but I expect you to turn in your own, individual work.

**Quizzes:**

These will be given approximately every third week. You will have 30 minutes to complete the quizzes. Questions will include a mixture of technical problems and short-essay questions. You may be required to solve mathematical problems, draw graphs, and to critically assess readings from the course. There will be five quizzes that are scheduled in advance. If you will miss class on a quiz day, you must tell me by the end of week two. Otherwise, I will not allow makeup quizzes except in the rare exception of an emergency that causes you to miss class.

**Group Presentations:**

I will assign students to groups of 3 or 4 students and each group will give a brief presentation on the topic. Preparing for the presentations will give the presenting students an opportunity to explore a course topic in depth, and it will give the audience a break from listening to the professor lecture!

**Essay:**

Students are required to write an individual essay. Undergraduates can choose from any of the 12 topics that will be presented by groups. Your essay is not to exceed five pages, double spaced, 12 point font, one inch margins all around. The five-page limit includes diagrams, equations, and data tables (if any). The paper will be graded based on organization/grammar (20%) and content (80%).

**Final Exam:**

There will be a two-hour comprehensive final exam. Your grade will depend on how well you demonstrate both intuitive and technical understanding of course concepts.

**Student Conduct:**

Laptops are allowed in class, but the purpose should be for taking notes (not browsing the internet, checking your e-mail, Facebook, etc). Cell phones, iPods, and other devices are distracting and should not be out during class. With the exception of calculators, all electronic devices must be turned off and out of reach during exams and quizzes.

**Academic Honesty:**

I will not tolerate cheating. If I catch you cheating on a quiz or exam, or plagiarizing material in your research paper, then you will receive zero credit for the quiz, exam, or paper. I may also pursue harsher penalties through the University.

**Guidelines for Doing Well in the Class:**

- *Attend all classes* – quizzes, problem sets, and exams focus on material discussed in class, and some of the lecture material will not come from the textbooks
- *Keep up with reading* – be “on same page” – or at least on same chapters
- *Devote necessary time* – the typical student should devote 4 hours reading, doing assignments, and/or reviewing notes for each hour of class.

**TENTATIVE SCHEDULE (Subject to Change)**

Week	Topics	Readings	Notes
1 (Jan. 17, 19)	Course overview, Open access	SR 1	
2 (Jan. 24, 26)	Common property	SR 2	Thursday: SP 1
3 (Jan. 31, Feb. 2)	Anticommons	SR 3, p. 660-688 SR 4	Tuesday: PS 1 due Thursday: Quiz 1
4 (Feb. 7, 9)	Forestry	SR 5 SR 6	Tuesday: SP 2
5 (Feb. 14, 16)	Forestry & Land Conservation	SR 7 SR 8	Tuesday: SP 3 Thursday: SP 4
6 (Feb. 21, 23)	Land Conservation	SR 9	Tuesday: PS 2 due Thursday: Quiz 2
7 (Feb. 28, Mar 2)	Fisheries	SR 10 SR 11	Tuesday: SP 5
8 (March 7, 9)	Fisheries	SR 10 SR 11	Thursday: PS 3 due
9 (March 14, 16)	Fisheries	SR 12	Tuesday: Quiz 3 Thursday: SP 6, SP 7
SPRING BREAK			
10 (March 28, 30)	Wildlife	SR 13 SR 14	
11 (April 4, 6)	Wildlife	SR 15	Thursday: PS 4 due, SP 8
12 (April 11, 13)	Water	SR 16	Tuesday: Quiz 4
13 (April 18, 20)	Water	SR 17 SR 18	Thursday: SP 9
14 (April 25, 27)	Minerals & Fossil Fuels	SR 19 SR 20	Tuesday: PS 5 due Thursday: Quiz 5
15 (May 2, 4)	Minerals & Fossil Fuels	SR22	Thursday: SP 10
Week 16	Comprehensive Final Exam on Thursday, <b>May 11</b> from 2:45 to 4:45 pm		

## Supplementary Readings (SR) (subject to change)

1. Hardin, Garrett. 1968. The Tragedy of the Commons. *Science* 162: 1243-48
2. Dietz, Thomas, Elinor Ostrom and Paul Stern. 2003. The Struggle to Govern the Commons. *Science* 302 (5652): 1907-12.
3. Heller, Michael. 1998. The Tragedy of the Anticommons: Property in the Transition from Marx to Markets. *Michigan Law Review* 111(3): 621-688.
4. Fennell, Lee Anne. 2011. "Commons, Anticommons, Semicommons." In *Research Handbook on the Economics of Property Law*. Eds. K. Ayotte and H.E. Smith.
5. Field, Barry C. 2008. "Chapter 12: Forest Economics" in *Natural Resource Economics*, Waveland Press, Longrove Illinois.
6. Conrad, Jon M. 2010. "Chapter 4: The Economics of Forestry" in *Resource Economics*, 2<sup>nd</sup> Edition. Cambridge University Press.
7. Tietenberg, Tom and Lynne Lewis. 2012. "Chapter 10: A Locationally Fixed, Multipurpose Resource: Land" In *Environmental & Natural Resource Economics*, pp 237-261.
8. Parker, Dominic P. and Walter N. Thurman. 2013. Conservation Easements: Tools for Conserving and Enhancing Ecosystem Services. In *Encyclopedia of Energy, Natural Resource, and Environmental Economics*
9. Alix-Garcia, Jennifer and Hendrik Wolff. 2014. Payment for Ecosystem Services from Forests. *Annual Review of Resource Economics*: 361-380.
10. Field, Barry. C. 2008. "Chapter 13: Marine Resources" in *Resource Economics*, 2<sup>nd</sup> Edition. Cambridge University Press.
11. Conrad, Jon M. 2010. "Chapter 3: The Economics of Fisheries" in *Resource Economics*, 2<sup>nd</sup> Edition. Cambridge University Press.
12. Deacon, Robert T. 2009. Creating Marine Assets: Property Rights in Ocean Fisheries. PERC Policy Series No. 43. Available at: <http://perc.org/sites/default/files/ps43.pdf>
13. Field, Barry. C. 2008. "Chapter 18: Economics of Wildlife Management" in *Resource Economics*, 2<sup>nd</sup> Edition. Cambridge University Press.
14. Brown, Gardner M. and Jason F. Shogren. 2005. Economics of the Endangered Species Act. In *Economics of the Environment*, Edited by Robert N. Stavins. W.W. Norton & Company, New York, NY: 514-532.
15. Fischer, Carolyn. 2010. Does Trade Help or Hinder the Conservation of Natural Resources? *Review of Environmental Economics and Policy* 4:1, 103-121.
16. Field, Barry. C. 2008. "Chapter 15: Water Resources" in *Resource Economics*, 2<sup>nd</sup> Edition. Cambridge University Press.
17. To be announced
18. To be announced
19. Field, Barry. C. 2016. "Chapter 10: Mineral Economics" in *Resource Economics*, 3<sup>rd</sup> Edition. Cambridge University Press.
20. Conrad, Jon M. 2010. "Chapter 5: The Economics of Nonrenewable Resources" in *Resource Economics*, 2<sup>nd</sup> Edition. Cambridge University Press.
21. To be announced
22. To be announced

**Student Group Presentation Topics (SP)** (subject to change)

1. Are all commons tragedies? The decimation of American Bison
2. Are anticommons problems an obstacle to wind farming? **OR** What are the Drawback of Subdividing the Commons in Kenya?
3. A comparative analysis of forest management: two forests under the Big Sky
4. What is REDD and is it working? **OR** What is forest certification and is it working?
5. Is it good economic policy to require that conservation easements be perpetual?
6. Do ITQs have drawbacks and why is fishery reform slow?
7. What market-based strategies are being used to conserve fish that are not commercially valuable? Are these strategies promising alternatives to regulation?
8. What is CAMPFIRE and is it a good alternative to national hunting bans? **OR** Does trade hinder or help wildlife conservation?
9. What is happening to groundwater in the Wisconsin central sands and what are solutions?
10. What are the advantages and disadvantages of regulating resource extraction at the local level?