

**Frontiers in Environmental & Natural Resource Economics 1**  
**AAE 760**  
**Fall 2022**

**Instructor:**

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**Class Meetings:**

Tuesdays and Thursdays, 1:00 – 2:15 p.m, Taylor Hall B30

**Office Hours:**

By appointment.

**Class Website:**

We will use Canvas. Check for Zoom links, announcements, readings, and assignments.

**Course Description:**

This course examines the operation of markets for natural resources, including fish, forests, wildlife, water, land, fossil fuels, and renewable energy. Special emphasis will be given to the role that resource governance, regulation, and property rights play in affecting resource use. The course is slightly multi-disciplinary because a basic understanding of natural science processes and property law are necessary for economic analysis. For this reason, the readings present simple biological models for studying fisheries, wildlife, and forests and incorporate geological and hydrologic concepts in examining minerals and water. The readings also describe ownership rights to resources, which often are not clearly defined. In these cases the interests of some potential resource users will not be reflected in market outcomes and the scramble or “race” to acquire un-owned resources is often wasteful. Because the use of some natural resources is ultimately linked to the release of waste into the environment, there are also considerations of environmental degradation that result from certain ownership regimes. We will encounter these themes throughout the course.

The readings and lectures will introduce the tools of resource economics, which differ from standard microeconomics because of the stronger emphasis on dynamic optimization. Important concepts include *open access*, *commons*, *anticommons*, *steady state*, *maximum sustained yield*, and *discounting*. Important tools include analytical models of optimal control and numerical simulation.

**Useful Textbooks**

Conrad, Jon M. 2010. *Resource Economics*, Cambridge University Press.

Conrad, Jon M. and Colin W. Clark. 1987. *Natural Resource Economics: Notes and Problems*, Cambridge University Press.

The Conrad and Clark book focuses on modelling methods and spends relatively little time with institutional details or discussion of resource industries and policy issues. These topics will be treated in readings from journals and other books. The Conrad *Resource Economics* book is similar

to Conrad and Clark, but a bit less technical in terms of modeling. It allocates more of the book to discussing resource industries and policies and a fair amount of attention is given to simulation exercises.

### Journal Articles

Much of the course content will come from classic and recent journal articles in natural resource economics. Some readings will be required, and some will be optional.

### Grading and Course Structure:

Contributions as discussion leader	25%
Contributions as class participant	25 %
Problem sets	20 %
Research paper	30 %
<b>Total</b>	<b>100 %</b>

### Reading and Participation

Much of our class time will be spent discussing papers, but I will also lecture a little on core themes. When we discuss specific papers we will use the following protocol:

- One student will be assigned to act as **discussion leader** for the paper. We will take turns leading discussion.
- All students will **arrive prepared** to contribute to a thorough and in-depth discussion of the assigned readings.

Presentations by discussion leaders should span approximately 15 minutes and address the following items. 1) What research question(s) is addressed and why is this question important? 2) What is the main theoretical approach (if not purely an empirical paper) and what are the important assumptions? 3) If the paper is empirical, what is the data set and empirical estimation strategy? 4) What are the key results? 5) What did you like best about the paper? 6) What was confusing or not convincing? 7) What follow up research questions does the article motivate? The group discussion will focus on (5), (6) and (7).

### Problem Sets:

I will lecture from textbooks and related materials during some weeks and will assign problem sets based on the lecture material. The problem sets may require you to solve analytical models or perform numerical simulations. The problem set portion of your grade will be determined by the quality (and timeliness) of your answer sets.

### Research Paper:

Each student will develop (or advance) an original research paper that is due on December 16th. Ideally, student papers will relate to themes discussed in the class. I'll ask you to provide a one page document early in the semester that summarizes your research plan. Please make the plan available to all students, so that we can all give feedback. I'll also ask you to meet with me to provide a progress report later in the semester. During the last week of class students will present their research papers.

## **Course Learning Objectives:**

Successful students will

- Learn to model the dynamic management of natural resources by rational economic actors;
- Apply appropriate methodologies to demonstrate the conditions under which benefits from resources are likely to be captured or dissipated by real world actors;
- Develop and hone presentation and discussion leadership skills; and
- Make progress on developing their own research agenda.

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

- *Attend all classes*
- *Keep up with reading*
- *Devote necessary time* – the course meets two 75 minute periods per week and carries the expectation that students will work on learning activities (reading, writing, problem sets, studying, etc.) for about 3-4 hours out of classroom for every class period.

## **Accommodations for Students with Disabilities:**

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform me of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. I will work either directly with you or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

## **Diversity and Inclusion:**

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

**TENTATIVE SCHEDULE** (Subject to Change); \*Can skim

Week	Topic	Readings	Notes
1 Sept. 8	Syllabus, course organization		
2 Sept. 13, 15	Tragedy of the commons  Empirical applications	<u>Tuesday</u> Hardin 1968, Karpoff 2022  <u>Thursday</u> *Taylor 2011, Chen and Lan 2017, Ayres et al. 2022	Parker led discussion  Student led discussion
3 Sept. 20, 22	Endogenous property rights  Empirical Applications	<u>Tuesday</u> Demsetz 1967, Copeland and Taylor 2009  <u>Thursday</u> Kaffine 2009, Hill 2014*, Rao et al. 2020	Parker will discuss Demsetz, Student will discuss C & T  Student led discussion
4 Sept. 27, 29	Coase Theorem  Empirical Applications	<u>Tuesday</u> Coase 1960, Weyl 2022  <u>Thursday</u> Deryugina et al. 2021, Adrian et al. 2022	Parker will discuss Coase, Student will discuss Weyl  Student led discussion
5 Oct. 4, 6	Tragedy of the Anticommons  Empirical Applications	<u>Tuesday</u> Heller 1998, Buchanan and Yoon 2000  <u>Thursday</u> Leonard and Parker 2021, Parker et al. 2022	Student led discussion  Parker led discussion
6 Oct. 11, 13	Overview of fishery economics  Catch-Shares, Cooperation, and Political Economy	<u>Tuesday</u> Conrad text, Ch. 3 Conrad and Clark, Ch. 2  <u>Thursday</u> Hsueh 2017*, Isaaksen and Richter 2019, Deacon et al. 2013, Grainger and Parker 2013*	Parker led discussion  Student led discussion

7 Oct. 18, 20	Overview of forest economics  Deforestation determinants & climate change	<u>Tuesday</u> Conrad, ch. 4  <u>Thursday</u> Blackman and Villalobos 2020, Abman and Lundberg 2019, Sohngen 2020	Parker led discussion  Student led discussion
8 Oct. 25, 27	Payments for Ecosystem/Environmental Services	<u>Tuesday</u> Wunder et al. 2020, Robalino et al. 2017  <u>Thursday</u> No Class	Student led discussion
9 Nov. 1, 3	Conservation Easements  Markets for Conservation	<u>Tuesday</u> Parker and Thurman 2019, Parker and Thurman 2018  <u>Thursday</u> Deacon and Parker 2009*, Leonard et al. 2021, Ansink et al. 2022, Harsted 2012	Parker led discussion  Student led discussion
10 Nov. 8, 10	Water	<u>Tuesday</u> Debaere and Kurzendoerfer 2017, Rouhi et al. 2021  <u>Thursday</u> Bruno and Jessoe 2021, Kocornik-Mina 2020	Student led discussion  Student led discussion
11 Nov. 15, 17	Overview of non-renewable resource economics	<u>Tuesday</u> Conrad, ch. 5 Conrad and Clark, ch. 3  <u>Thursday</u> No Class	Parker led discussion
12 Nov. 22, 24	Fossil Fuel Policy	<u>Tuesday</u> Prest 2022, Johnsen et al. 2019*, Gerarden et al. 2020, Marks 2022*  <u>Thursday</u> No Class	Student led discussion

13 Nov 29, Dec 1	Resources and conflict	<u>Tuesday</u> Berman et. al 2017, Parker et al. 2016*, Parker and Vadheim 2017*, de la Sierra 2020.	Student led discussion
	Resource Booms and Busts and Energy Transition	<u>Thursday</u> Weber 2020, Van der Ploeg and Reazi 2020*, Katovich et al. 2022	Student led discussion
14 Dec 6, 8	Renewable Energy & Electricity	<u>Tuesday</u> Cicala 2022, Levinson and Silva, Benear 2022, Hahn and Metcalfe 2021	Student led discussion
		<u>Thursday</u> Lopez and Schill 2021, Holland et al. 2021, Sexton et al. 2021*	Student led discussion
15 Dec 13, 15	Student research presentations		

### Substitute Topics and Readings

Trade, Natural Resources, and Environmental Quality  
Erhard 2018, Shapiro 2021, Prasad et al. 2022

Adaptation to Climate Change  
Waldinger 2022, Blakeslee et al. 2020, Aragon et al. 2021