FISH/ECON 230
Economics of Fisheries and Oceans

Spring 2023
MWF 1:30-2:50 Sieg134
5 Credits

Instructor	TAs
Professor Chris Anderson (he/him) 316A FISH https://washington.zoom.us/my/chrisanderson cmand@uw.edu	Abby Schamp (she/her) OH: Mon 6:00-7:00PM Zoom: 211-850-7875 schampab@uw.edu Kat Leigh (she/her) OH: Wed 9:00-10:00AM Zoom: 396-147-0187 kleigh11@uw.edu
Office hours: Th 3-4 or by appt (really)	

Overview

The primary objective of this course is to develop an understanding of how and why people interact with the oceans, and why these interactions often lead to environmental degradation. To develop this understanding, we will use the tools and methods of economics to examine three major, current environmental issues: ocean change and the consequences of our food and energy choices; overfishing; and offshore oil drilling. For each issue, we will carry out a four-step evaluation process:
1) assess the status of and evidence for the problem;
2) identify the incentives that lead people to choose problem-causing actions;
3) consider alternative policies to manage those incentives; and
4) discuss why effective management has not yet been implemented.

Learning Goals

Through the four-step problem evaluation process, the chosen applications will introduce frameworks that explain behavior and outcomes:

- Know the status of ocean health, with respect to warming, acidification, sea level rise and hypoxia; fish stock status; and oil spill risk, and the primary causes of that status.
- Interpret and apply the model of competitive equilibrium
    - Explain how prices, quantities and allocations are determined through markets to predict the effects of supply and demand shocks, including taxes and subsidies.
    - Understand why economists think of markets as efficient.
    - Explain ocean change as an externality problem, and understand how commonly discussed policy approaches work.
    - Apply the model to infer changes in price and quantities based on news events.
- Analyze fisheries as a renewable common pool resource

    - Explain the predicted outcome for unregulated common pool resources.
    - Explain how commonly discussed policy approaches are addressing the problem.
    - Apply the model to infer economic and ecological outcomes in new situations.
- Identify who bears the costs and receives the benefits of policies, and identify when policy effects are sufficient to motivate political activity.
    - Analyze the incentives present in the political system to identify policies that are or are not politically viable.
- Interpret results from the tools of environmental economists use to evaluate policies that trade off between people's welfare and environmentally destructive activities.

Pedagogical and evaluation methods will practice skills in:

- Critical reading of news and interpretation of events to understand described motivations and effects.
- Developing and structuring arguments that explain how and why.
- Applying and interpreting graphical models.
- Writing and revising technical communication conveying models to readers.

Readings

We will be framing some of our issues through a recently released (2021) book by a thought leader who just happens to be a local. It is widely available for electronic reading at modest cost.

How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need. by Bill Gates.

You are required to have a microeconomics text, but any one will do. Past students have liked the recommended text, so if you don't have easy access to a different one, get any edition between the third and eighth (current) from your favorite online store:

Principles of Microeconomics by N. Gregory Mankiw

Canvas

Many required and supplemental readings will be posted on the course Canvas site. Assignments will also be distributed on the course page on Canvas. You will be responsible for accessing the site on a regular basis.

Methods of Instruction

Barring dramatic changes in health recommendations on campus, this course will be taught fully in-person. While short video lectures may be made available through Canvas to introduce or support material presented in class, I am not planning to record class sessions and will not be offering remote synchronous attendance. Please let me know if you have multiple absences so we can arrange to get you necessary material.

This course will operate as a "partially flipped" classroom. Key content will be delivered in both in short pre-recorded videos, and in in-person class meetings. Class meetings will involve a variety of activities, often mixing modes of instruction within a single class meeting.

Lectures allow me to introduce and reinforce the frameworks we will be using for analysis, drawing on models and interpretations from different sources. Lectures will make extensive use of the "whiteboard", and will involve constructing a lot of graphs. They will be your primary guide to the material I think is important, and thus will appear on quizzes and exams.

Prerecorded videos Some concepts will be introduced through short pre-recorded videos that should be watched before class, in support of a partially-flipped classroom. Textbook readings are supportive of lecture materials, and may be referenced as needed. Videos will remain posted so they can be reviewed at any time.

Full-class discussions will enable us to reach a common understanding on the important conclusions and implications of class readings. Non-textbook readings are expected to be completed before the class in which they are covered. We will have full class discussions during the Status & Evidence stage of each unit.

Breakout group discussions Class will break into small groups in order to collectively respond to some questions I frame. These are often precursors to full-class discussions.

Breakout group exercises Class will break into small groups to practice solving problems using the models and frameworks developed in class. Often, we will read a short newspaper article, or listen to or watch a news clip, apply the models we are currently learning to better understand the event reported, the actions of the people affected, and the reasoning or mechanisms behind the reported effects. These applications will be practice for exam short answer questions and your final project.

Class exercises are experiential games that give hands-on experience facing the decisions of the people whose choices we are studying. In addition to being fun, they provide focus and insight that will help you interpret and apply models. Points earned in the class exercises will provide extra credit.

Grading

Grades will be determined as follows:

Quizzes	10%	Midterms (2)	35%
Homework	15%	Final Project	40%

Mid-terms

There are two 80-minute in-class mid-term exams during the term, each counting for 17.5% of the grade. The exams emphasize the most recently covered material, and are not explicitly cumulative. Roughly half the points on the exam consist of college-level

multiple choice questions. The balance of the exam is short answer questions, most of which ask you to apply models from class to interpret news article given to you with the exam.

Homework Assignment and Quiz Policy

Homework will be assigned slightly less often than weekly, and designed to reinforce important concepts from class. They frequently include problems from the short answer sections of past exams. Homeworks are due at the beginning of class on the day for which they are assigned. Late assignments will be accepted until that assignment is graded, but will be penalized 5% for each day they are late.

Quizzes will be given promptly at the beginning of class each Friday and consist of five multiple-choice questions. They are designed to help you keep up with the material, and give you practice on the type of questions on the multiple choice section of the exams. Missed quizzes cannot be made up, but

Final Project

In the lieu of a final exam, we will have a final paper in which you will apply the skills you have learned in this course. You will research and analyze a current local, state, national or global environmental or natural resource issue. In grading the papers, I will be looking for your ability to carry out the four-step approach to environmental issues used in class: a solid description of scientific evidence demonstrating that there is an issue; an analysis of the incentives which have led to the situation you are studying; a coherent discussion of how one policy option addresses the incentives causing the problem; and then an explanation of why that effective policy has or has not been implemented in the case you describe. Since this is an *economics* class, particular emphasis will be placed on your analysis of the incentives involved in your problem using the tools we have discussed in class.

Policies

Attendance

This class covers wide range of tools and factual material, including new ways of thinking about and managing the environment. Attendance will not be taken in the synchronous session. However, attending and participating in the synchronous class is the primary way to understand the models being used and how they apply to the problems we are studying; attendance is essential to doing well in this class.

In-class Technology

You may use tablets or laptops to take notes and refer to readings in class. However, lecture will involve constructing many graphs by drawing, and keyboard interfaces may make keeping up difficult.

You may not use computers for email or social media, or use phones for any purpose, during class, as it is disrespectful and distracting to other students.

Collaboration

Your peers are often your best resource for learning. Working in groups to complete exercises and plan and revise your final paper is strongly encouraged. However, any work you turn in must be in your own words. It is suggested you make sparse notes in a group setting, and then write up your own answers to turn in.

Academic (Mis)Conduct

At the University level, passing off any other person's or ChatBot's scholarly work (which can include written material, exam answers, graphics or other images, and even ideas) as your own, without proper attribution, is considered academic misconduct. Because I am interested in how well you understand and can explain the situations and models discussed in class, it is imperative your work is in your own words. Shared homework or test answers or plagiarized assignment answers, will receive a zero for the assignment for involved parties and will be referred to the university for disciplinary action.

Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). I expect that you will know and follow the university's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the College of the Environment Academic Misconduct Policy and the University of Washington Community Standards and Student Conduct website. University plagiarism policies apply.

Disability

Full participation in this course requires the ability to read and synthesize written material, attend three classroom sessions a week (up to 80 minutes), participate in class discussion, and compose mathematical and graphical answers to homeworks and projects. If you anticipate or experience barriers to your learning or full participation in this course based on a physical, learning, or mental health disability, please contact the instructor to discuss possible accommodation(s) within the first week of class, or at least a week before you anticipate an issue. The instructor will maintain confidentiality of the disability and associated accommodations.

A more complete description of the disability policy of the College of the Environment can be found http://coenv.washington.edu/intranet/academics/teaching/disability-accommodation/. If you have, or think you have, a temporary or permanent disability that impacts your participation in any course, please also contact Disability Resources for Students (DRS) at: 206-543-8924 V / 206-543-8925 TDD / uwdss@uw.edu e-mail / http://www.uw.edu/students/drs.

Reading List (Subject to change)

Acheson, J. and R. Gardner. 2011. Modeling Disaster: The Failure of Management of the New England Groundfish Industry. *North American Journal of Fisheries Management* 31(6):1005-18.

Anderson, C., M. Krigbaum, M. Arostegui, M. Feddern, et al. 2018. How Commercial Fishing Effort is Managed. *Fish and Fisheries*. DOI: 10.1111/faf.12339.

Economist Explainer. 2016. What is the Nash Equilibrium and Why Does it Matter? http://www.economist.com/blogs/economist-explains/2016/09/economist-explains-economics

Field, B. *Natural Resource Economics: An Introduction*. 2001. Long Grove, IL: Waveland.

Gates, B. 2021. *How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need*. New York, NY: Knopf.

IEM. 2010. A Study of the Economic Impact of the Deepwater Horizon Oil Spill. http://gnoinc.org/wp-content/uploads/Economic_Impact_Study_Part_I_-_Full_Report.pdf

IPCC, 2013: Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Mississippi River Gulf of Mexico Watershed Nutrient Task Force. 2013. Reassessment 2013: Assessing Gulf Hypoxia Action Plan.

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (NCBPDHOSOD). 2011. Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling. http://docs.lib.noaa.gov/noaa_documents/NOAA_related_docs/oil_spills/DWH_report-to-president.pdf

NOAA 2000. Final Integrated Assessment of Hypoxia in the Northern Gulf of Mexico. http://oceanservice.noaa.gov/products/hypox_final.pdf

Sewell, B et al. 2013. Bringing Back the Fish: An Evaluation of US Fisheries Rebuilding under the Magnuson-Stevens Fishery Conseration and Management Act. NRDC Report R:13-01-A. https://www.nrdc.org/sites/default/files/rebuilding-fisheries-report.pdf

Weber, M. and J. Gradwohl. 1995. *The Wealth of Oceans*. New York: WW Norton.

Welch, C. 2013. Sea Change. http://apps.seattletimes.com/reports/sea-change/2013/sep/11/pacific-ocean-perilous-turn-overview/

Class Schedule (Preliminary and subject to revision)

Readings in Italics are to be completed before the class for which they are listed (others are for reference)

Date	Topic	Concepts	Readings
3/27	Introduction: Resource management or *people* management?	Prisoner's dilemma exercise	*Economist* Explainer 2016
3/29	*Status & Evidence*: Capitalism vs. the Climate		*Gates 1,2*
3/31	*Status & Evidence*: Zeroing Emissions		*Gates 4, 6 and one of 5,7,8*
4/3	*Incentives*: How do markets set prices?	Trade exercise	Mankiw Ch. 4
4/5	*Incentives*: What motivates people? Tradeoffs, happiness and utility	Opportunity sets Budget constraints Indifference curves	Mankiw Ch. 1 (1-7)
4/7	*Incentives*: Model of competitive equilibrium	PS, CS, Efficiency	Mankiw Ch. 7
	Ocean Change & Dead Zones		
4/10	*Status & Evidence*: Ocean Change		*Welch Ch. 1,2,3,5* *IPCC Report*
4/12	*Incentives*: Analyzing the market for Gasoline	S/D Shocks Flat/Steep	
4/14	*Incentives*: Market applications, review		
4/17	*Incentives*: Externalities		Mankiw 203-209
4/19	*Policies*: Command and control; taxes and subsidies; cap-and-trade	Pigouvian taxes Cap-and-trade	*Gates 10, 11*
4/21	*Policy Implementation*: The collective choice model		Mankiw 209-220

4/24, 26	*All 4 steps*: Hypoxia: Food's Effects on the Ocean	CRP TMDLs Subsidy removal	*Review Gates 6* *EPA 2008*
4/28	**Exam I: Marine Pollution Unit**		
	Fisheries and Overfishing		
5/1	*Status & Evidence*: Overfishing	Evidence Council System	*Wealth of Oceans Ch. 8* *Sewell 2013*
5/3	*Incentives:* Common property resources (static)	Static CPR exercise (Goat farming game)	Mankiw 232-237
5/5	*Incentives:* Static bioeconomic model	Graphical	*Field Ch. 13*
5/8	*Incentives*: How much to produce?	Production functions Profit max P=MC Short/long run	Mankiw Ch. 13
5/10	*Policy*: Self-governance	Community Management	*Spatial: Foale et al. 2013* TBD
5/12-15	*Policy*: Managing the commons	TAC and Derby Spatial Catch shares ITQ	*Overview: Anderson et al. 2018*
5/17	*Policy Implementation*: Applying the collective choice model to fisheries		*Acheson & Gardner 2011*
	Managing Disasters: Offshore Drilling, Pandemics, etc.		
5/19	*Status & Evidence*: Deepwater Horizon		*NCBPDHOSOD Ch 6.*
5/22	**Exam II: Fishery Unit**		

5/24	*Incentives*: Understanding the risk of disasters	Probability Expected value Rational violations	
5/26	*Incentives*: Optimal nonrenewable resource use	Discounting Net present value	
5/29	*Memorial Day (no class)*		
5/31	*Policy*: Cost-benefit analysis & environmental damage assessment	Cost-benefit analysis Economic Impact Hedonic pricing	*IEM 2010*
6/2	Summary & Final Project workshop (*Attendance mandatory*)		*Gates 12*
6/6	Final Project Due NOON		