Course Description

Economics is the study of the use of scarce resources to satisfy human wants. Current debates over fisheries management, offshore oil drilling, and ocean zoning clearly demonstrate the importance of thinking about the ocean with an economist’s perspective. This class will use the toolkit of economic analysis to evaluate specific marine policies in the areas of ocean recreation, shipping, energy production, aquaculture, fishing, coastal construction, and coral reef protection. The course will utilize a variety of teaching methodologies including in-class experiments, mock debates, computer simulations, audiovisual presentations, guest speakers and traditional lectures.

Students may take the course on a pass-fail basis. To enroll in this course, students must have already taken Economics 130 or an equivalent microeconomics course approved by the professor.

Students must take each exam on the date scheduled. Exam dates will not be changed for individual students to accommodate job interviews, family events, etc. Exceptions will be made only for serious medical reasons or in the event of a death in the family. If a student athlete must be off-campus the day of an exam, s/he must take the exam on the same date and supply his/her answers by email or fax on that date.

Any student who feels s/he may need an accommodation based on the impact of a disability is invited to contact me privately. I would be happy to work with you, and the KOKUA Program (Office for Students with Disabilities) to ensure reasonable accommodations in my course. KOKUA can be reached at (808) 956-7511 or (808) 956-7612 (voice/text) in room 013 of the Queen Lili'uokalani Center for Student Services. I know from personal experience how useful the services KOKUA provides can be, so please don’t be shy about contacting me.
**Student Learning Objectives**
The course is designed to enhance the student’s ability to understand economic concepts and models and to assess their relevance to marine resource issues and policies. After completion of the course, students should be able to:

1. Rigorously evaluate the economic impacts of marine management policies
2. Explain the linkages between economics, law and environmental science in the marine sector
3. Communicate with professionals working in the ocean economy

**Textbook**

**Office Hours:**
My office is Saunders 532 and my office hours are on Tuesdays from 10am-12pm. It is best to make an appointment to ensure there isn’t another student there already. I use Google Calendar to schedule appointments. Just click on this link: [http://goo.gl/HSN0K2](http://goo.gl/HSN0K2) and select a 15 minute slot. Make sure that your Google Calendar is set to Hawai’i time and that you are viewing the calendar in “Week” mode. If you can’t make any of these times, email me and we can set up an appointment.

**Assessment**

**Assignments, Midterms and Final**
There will be several short assignments during the semester. The assignments will typically be computational exercises and will be linked to the topics and case studies under discussion. You will need access to Microsoft Excel or similar software to complete the assignments. All of the College of Social Sciences computer labs have Excel installed ([http://www2.soc.hawaii.edu/pages/tech/lab.html](http://www2.soc.hawaii.edu/pages/tech/lab.html)). There will be two midterm exams (1 hour and 15 minutes) and a final exam (2 hours). The first midterm will be held in class on Tuesday October 9th. The second midterm will be on Thursday November 15th. The final will be held on Tuesday December 11th at 12pm.

**Research Paper**
In the research paper, you should apply the concepts and analytical tools from the course to analyze and evaluate a current or potential environmental policy. The paper should be 8-10 pages in length. Guidelines for preparing and writing the research paper will be offered later in the course. Research papers will be due at 5pm on Friday December 6th.

**Grades**
The course grade will be based upon assignments (10 percent), midterms (25 percent),
research paper (25 percent) and the final (40 percent).

**Topics and Readings**
The readings listed below are required unless stated otherwise. Ideally, they should be completed prior to the lectures with which they are listed. Nearly all of the readings will be made available on Laulima.

1. **Introduction to the Ocean Economy and Microeconomics Refresher**
   We will begin with a quick overview the different sectors and industries in the Ocean Economy (see the reading from the National Ocean Economics Program). I will then give a brief history of the Law of the Sea and its implications for different sectors in the ocean economy. We will conclude with a quick refresher of the basic principles underlying most economic analysis. We will start with the simple model of a competitive market and remind ourselves how to calculate consumer and producer surplus. We will extend our analysis to the realm of “market failures”, in particular the role of externalities, public goods and common property resources. This lecture will conclude with a broad discussion of the policy instruments used to address market failures such as taxes/subsidies, cap-and-trade regulation and enclosure of the commons. The case studies used to highlight these principles will include the 1973-74 Oil Crisis, the establishment of SO₂ Permit Markets and the current carbon tax vs. cap-and-trade debate.

*Readings:*
Chapters 2, 4 and 15 of Tietenberg and Lewis, *Environmental and Natural Resource Economics* [Not required]

2. **Basic Marine Ecology and Bioeconomics**
   What are the forces that affect the distribution and abundance of marine species? We will explore the role of habitat, growth, reproduction, competition and predation. The key concept of density dependence will be introduced. What does it mean, where is it observed/expected and what causes it? We will think about the different ways that we can model the life history of various marine species in order to make predictions about growth, movement, reproduction and species interactions.

*Readings:*

3. **Fisheries Economics**
   This topic is the core of the course. Students will learn how to couple market systems with natural systems in a unified modeling framework. We will focus on deriving bio-economic equilibria and on optimizing yield from fisheries. We will look at a range of policies designed to achieve sustainability, economic optimality or both. This part of the course will conclude with an overview of the empirical techniques used to test whether fisheries management policies are achieving their desired goals. A key case study will be the Alaskan halibut fishery and its transition through various forms of fisheries
management.

Open Access vs. the “Sole Owner”

Readings:
(3) Chapters 2 and 3 of Ola Flaaten’s free textbook [not required]

Extinction under Open Access and the Sole Owner


Local and Global Status of Fish Stocks

Readings:
(4) Myers and Worm, Nature, 2003 [not required]
(5) Worm et al., Science, 2006
(6) Worm and Hilborn et al., Science, 2009 [not required]

Video:
The End of the Line

Community management of the commons

Readings:

Government regulation of the commons: biological rules, effort restrictions and taxes

Readings:

Government-regulated “enclosure” of the commons: co-ops and catch shares
Readings:

Interactive Exercises:
In-class “Race to Fish” experiment.
Electronic over-fishing experiment

Beyond the commons: dealing with fishing’s other externalities: bycatch and habitat damage

Readings:
(1) “Voluntary Cooperation in the Commons? Evaluating the Sea State Program with Reduced Form and Structural Models”, Abbott and Wilen, Land Economics
(2) Davies et al., Marine Policy, 2009

Demand-side Management

Readings:
(1) “Can Eco-Labels Tune a Market? Evidence from Dolphin-Safe Labeling” JEEM
(2) “Backward Boycotts: Demand Management and Fishery Conservation”
(3) “Seafood stewardship in crisis” Nature

Illegal, Unreported and Unregulated (IUU) Fishing

Readings:
(2) “The use of trade measures against illicit fishing: Economic and legal considerations”

4. Economics of Marine Reserves and Ecosystem-Based Management
The use and design of marine reserves is one of the most exciting new developments in marine conservation and fisheries management. This part of the course will introduce tools that can be used to evaluate existing and potential marine reserves. Case studies will include the Channel Islands, the Northwest Hawaiian Islands and the California MLPA process. This topic will conclude with analyzing how economics can be incorporated into the movement towards ecosystem-based management of marine resources.

Readings:
(1) Hastings and Botsford (1999) “Equivalence in Yield from Marine Reserves and

Traditional Fisheries Management”, *Science*.

*Interactive Exercises:*
We will use the computer software designed by the American Museum of Natural History ([http://ncep.amnh.org/marine_simulation/](http://ncep.amnh.org/marine_simulation/)) to design and implement our own marine reserves and study their effects on populations and fishery yields.

5. **Recreational Fisheries**
Recreational fisheries are very different to commercial fisheries, especially in terms of the incentives of participants and the types of regulations used. We will explore two topics in this section: the types of policies used to manage recreational fisheries and how do regulators make tradeoffs between commercial and recreational interests? A key case study will be the Gulf of Mexico Red Snapper Fishery.

*Readings:*
(4) Gentner, 2009

6. **Aquaculture**
Aquaculture is both a rising global industry and of important historical significance in many parts of the world. This part of the course will focus on emerging trends in the aquaculture industry, potential interactions with wild harvest, mitigation of negative impacts and the potential for demand-side management. Case studies will include Kona Blue Water Farms and the restoration of Hawaiian fishponds.

*Readings:*

7. **Methods for Measuring Non-Market Values and Cost-Benefit Analysis**
This part of the course will introduce the commonly used methodologies of Contingent Valuation, Hedonic Pricing and Travel Cost Valuation. These are different methods for
estimating non-market values, such as how much do people value the waves on the North Shore or mammals in the ocean. The case study of the Exxon Valdez Oil Spill will be used to illustrate how these methodologies are used in practice.

Readings:
(2) "Economic Impacts of the Spill". Exxon Valdez Oil Spill Trustee Council. http://www.evostc.state.ak.us/facts/economic.cfm

8. Economics of Offshore Energy Development
The course will conclude with a discussion of the optimal extraction of non-renewable resources, in particular Hotelling’s Rule. We will combine this with our earlier study of Benefit-Cost Analysis to evaluate the pros and cons of extending offshore oil drilling in the United States. In addition to our study of non-renewable sources of energy in the ocean, we will consider the potential role of renewable sources such as wave, tide and geothermal power.

Readings:
(1) Energy Information Administration. (2007) “Impacts of Increased Access to Oil and Natural Gas Resources in the Lower 48 Federal Outer Continental Shelf”
(2) “The Economics of Allowing More Domestic Oil Drilling” Hahn and Passell

9. The Economics of Ports and Shipping
We will discuss the Passenger Vessel Services Act and the Jones Act in relation to the US shipping industry. We will also discuss the debate over whether seaports should be subsidized, state-controlled and/or privately operated.