Economics 145 **THE ECONOMICS OF OCEAN RESOURCES** Spring, 2005

Course Hours: MWF 4:00 – 4:50 PM **Classroom**: Cognitive Science Building 002

Instructor: Dale Squires **Office**: Econ 110A
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Class Web Page:

Course Dates: March28-June 3
Finals Week: June 6-10

Course Objectives

The Economics of Ocean Resources is designed to provide students with both the economic theory and management concepts of natural resource use as they apply to ocean resources, and the factual and institutional knowledge necessary for well-informed applications.

The course develops several basic themes and applies them to different resources. First, the common thread running throughout the course is the theme of optimal allocation of ocean resources. Second, property rights for ocean resources are often limited or incomplete, and many resource allocation decisions are intertemporal in nature. As a consequence, competitive markets for ocean resources often fail to form, or when they do form, they fail to optimally allocate ocean resources among the competing uses. The market failure and subsequent suboptimal use of ocean resources therefore calls into play explicit options of management and public regulation. Third, population dynamics of species forms the basis of bioeconomic models for renewable resources, which combines population dynamics, habitat, biodiversity, and economics. Fourth, the economic concepts of total economic value (use, existence, and option value) and mixed goods (a mixture of private and public goods or common resources) are applied to dolphins, whales, sea turtles, and coral reefs in which management requires attention to both private and public uses and total economic value.

This first section of the course covers issues related to the conservation and management of fisheries. After a review of environmental and resource economics concepts, the course first develops simple population dynamics. The course subsequently

integrates the population dynamics with economics to form a bioeconomic model. The basis static bioeconomic model then forms the basis for subsequent discussion of public management of fishing industries. The first section includes one video discussing the current plight of the world's fisheries and discussing various policy measures. The first section also includes an in-class presentation of a computer game graphically illustrating the effects on a fish population of alternative harvesting strategies and fishery management policies.

The second section of the course is more applied and broader in nature, covering environmental issues associated with living marine resources. The section first develops an overall economic analytical framework, focusing on management of mixed goods (a mixture of private and public goods or common resources) and accounting for total economic value. Mixed good management forms one the current "hottest" environmental issue of the oceans, including dolphins, whales, sea turtles, and coral reefs. Specific analytic topics covered include common resources, public and mixed goods, total economic value, biodiversity, habitat, and wildlife management. Ecosystems management and sustainability are also touched upon. Videos and guest lectures will supplement the in-class treatment of several topics. Students are responsible for the readings on their own.

Course Requirements and Grading

1. Midterm examination in approximately week six -- 45% of course grade.

2. Final examination €└╒ 50% of course grade

- Covers all of the course material between the midterm and the class end but not explicitly the material covered by midterm.

3. One or more problem sets will be provided during the first part of the course and will be graded as pass / not pass. Their completion will count for 5% of the grade.

Reading Material

Most required reading material can be purchased in a packet from Cal Copy. The number of students wanting a packet will be determined on the second day of class and the order given to Cal Copy at that point. A few articles will be placed on reserves in the Undergraduate Library and some of the papers are available on-line.

* denotes required reading available by purchase

Department of Economics
University of California, San Diego
Economics 145

Dale Squires
Spring, 2005

THE ECONOMICS OF OCEAN RESOURCES
READING LIST

(* required material packet to be purchased from Cal Copy)
All readings required unless noted as optional under ""Further Reading (Optional)"

I. INTRODUCTION

1. Ocean Resources: An Overview

Note: The reference in this section should be skimmed to capture the main points. The material is primarily for background.

* "The Sea," Survey in *The Economist*, May 23, 1998, 18pp.

2. Property Rights, Public Goods, Common Resources, Externalities, and Environmental and Resource Problems

Scott, A. 2000. "Introducing Property in Fishery Management." In R. Schotten, ed., *Use of Property Rights in Fisheries Management*. FAO Fisheries Technical Paper 404/1. Rome: Food and Agriculture Organization of the United Nations. Sections 3 and 4.
Available online at: http://www.fao.org/docrep/003/x7579e/x7579e00.htm
(pdf file is available on class web site)

Powerpoint lectures available on class website.

II. THE ECONOMICS AND MANAGEMENT OF RENEWABLE MARINE RESOURCES

1. The Theory of Open Access and Bioeconomics

* Wilen, J. "Life Histories of Organisms," Section 4.2.(pp. 91-93) in "Bioeconomics of Renewable Resource Use," Chapter 2 in A.V. Kneese and J.L. Sweeney, eds., *Handbook of Natural Resource and Energy Economics*, Vol. I. New York: Elsevier Science Publishers B.V., 1985.

Hardin, G. "Tragedy of the Commons." Science, Vol. 162, 13 December, 1968,

http://www.economics.utoronto.ca/mturner/ec2908/readings/Hardin_Science1968.pdf
(pdf file is available on class website)

* Hartwick, J. and N. Olewiler. *The Economics of Natural Resource Use*. New York: Addison-Wesley, 1997, Chapter 4.

Computer simulation game in class to illustrate population dynamics and fisheries management.

Problem Set No. 1

Further Reading (Optional)

- Case, T. 2000. "Density Dependent Population Growth," Chapter 5 and "Exploited Resources," Chapter 10 in T. Case, *An Illustrated Guide to Theoretical Ecology*. Oxford University Press. (Not required – read for further understanding of density-dependent population growth and logistic equation in particular.) (Will be placed on reserves.)

2. Regulation and Public Policy within a Bioeconomics and Property Rights Framework

* Hartwick and Olewiler. Chapter 5.

Grafton, Q., D. Squires, and J. Kirkley. " Private Property Rights and the Crisis in World Fisheries: Turning the Tide?" *Contemporary Economic Policy* XIV (1996): 90-99. (pdf file is available on class website)

Scott, A. 2000. "Introducing Property in Fishery Management." In R. Schotten, ed., *Use of Property Rights in Fisheries Management*. FAO Fisheries Technical Paper 404/1. Rome: Food and Agriculture Organization of the United Nations. Section 5. Available online at: http://www.fao.org/docrep/003/x7579e/x7579e00.htm (pdf file is available on class website)

Possible guest lecture.

Video in class on fisheries issues and policy, *Empty Oceans, Empty Nets*

Further Reading (Optional)

- The Pew Commission's, "America's Living Oceans: Charting A Course for Sea

Change," can be viewed at:
http://www.pewtrusts.org/pdf/env_pew_oceans_final_report.pdf
(pdf file is available on the class website)

- U.S. Commission on Ocean Policy's, "An Ocean Blueprint for the 21st Century" can be viewed at:

http://www.oceancommission.gov/documents/full_color_rpt/000_ocean_full_report.pdf
http://www.nap.edu/books/0309063302/html/

- The entire volume edited by Ross Schotten is an invaluable source of further readings on rights-based management (individual transferable quotas in particular).

Available online at: http://www.fao.org/docrep/003/x7579e/x7579e00.htm

- Another excellent source of information on property rights in fishing is the National Research Council's, *Sharing the Fish: Towards a National Policy on Individual Fishing Quotas.*

3. Global Fisheries Issues

Pauly et al. "Fishing Down Marine Food Webs," *Science* Vol. 279 pp. 860-863 (Feb 6, 1998)
http://www.sciencemag.org/cgi/reprint/279/5352/860.pdf
http://www.fisheries.ubc.ca/members/dpauly/Science_6_Feb_1998.htm
(pdf file is available on class web page)

Pauly *et al*.. "Towards Sustainability In World Fisheries, *Nature* Vol. 418 pp. 689-695 (August, 2002).
The paper is also downloadable direct from Daniel Pauly's website at University of British Columbia: http://www.fisheries.ubc.ca/members/dpauly/Towards_Sustainability.pdf
(pdf file is available on class web page)

Powerpoint lecture available on class web site

Further Reading (Optional)

State of the World's Fisheries and Aquaculture by the FAO which can be downloaded at:
http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/007/y5600e/y5600e04.htm
(pdf file available on class web site)

World Bank. 2004. *Saving Fish and Fishers: Toward Sustainable and Equitable Governance of the Global Fishing Sector*. Report No. 29090-GLB. Washington, D.C.:
The paper can be downloaded at:

http://lnweb18.worldbank.org/ESSD/ardext.nsf/11ByDocName/SavingFishandFishersTowardSustainableandEquitableGovernanceoftheGlobalFishingSector/$FILE/SavingFishandFishers.pdf
(pdf file available on class web site)

MIDTERM EXAMINATION

III. THE MANAGEMENT OF MIXED GOODS IN AN ECOSYSTEMS FRAMEWORK: DOLPHINS, WHALES, SEA TURTLES, AND CORAL REEFS

1. Common Resources, Public Goods, Mixed Goods, Total Economic Value, Biodiversity

* Heal, G. "Biodiversity (Chpt. 6)," "Valuation (Chpt. 7)," "Sustainability (Chpt. 9)" in *Nature and the Marketplace*. Island Press (2000).

2. Dolphins

Hedley, C. "The 1998 Agreement on the International Dolphin Conservation Program: Recent Developments in the Tuna-Dolphin Controversy in the Eastern Pacific Ocean." *Ocean Development and International Law* 32 (2001): 71-92.
Available online at: http://www.oceanlaw.net/hedley/pubs/32odil71.pdf
(pdf file available on class web site)

Video in class and possible guest lecture.

3. Whales

* Schneider, V. and D. Pearce. 2004. "What Saved the Whales? An Economic Analysis of the 20th Century Whaling." *Biodiversity and Conservation* 13(3): 543-562.
(pdf file is available on class website.)

Possible guest lecture.

4. Sea Turtles

Dutton, P. 2005. "Reconciling Fishing with Biodiversity: A Holistic Recovery Strategy for Pacific Sea Turtles," in P. Dutton, D. Squires, and M. Ahmed, eds., *Conservation of Pacific Sea Turtles*, forthcoming. (pdf file available on class web site)

Guest lecture

Powerpoint lecture available on class web site