

Course Hours: MWF 4:00 – 4:50 PM**Classroom:** Warren Lecture Hall, Room 2001**Instructor:** Dale Squiresdsquires@irpsmail.ucsd.edu**Office:** By appointment**Office Hours:** Immediately preceding class
or by appointment**Teaching Assistant:** Erin Giffinegiffin@ucsd.edu**Office:** Econ 117**Teaching Assistant:** Deborah Watkinsdawatkin@ucsd.edu**Office:** Sequoyah 224**Teaching Assistant:** Kevin Raykdray@ucsd.edu**Office:** Econ 126**Teaching Assistant:** Jue "Jessie" Wangjuw046@ucsd.edu**Office:** Sequoyah 140**Teaching Assistant:** Viniyak Alladivalladi@gmail.com**Course Dates:** Monday, January 9, 2012 – Friday, March 16, 2011**Final:** Monday – Saturday, March 19-24**Holidays:** Martin Luther King, Jr. Monday, January 17
President's Holliday Monday, February 20

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 basic 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 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 impure public goods and also called mixed goods (a mixture of private and public goods) 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 on last Friday of week six -- 45% of course grade.

- Covers the concepts but not the mathematics. A problem set is designed to review and learn the mathematics of bioeconomic models.

2. Final examination is 45% 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. Two short assignments for 10% of the grade will be provided during the course and will be graded as good / pass / not pass, with 5 points for Assignment 1 (property rights essay) and 5 points for Assignment 2 (problem set). For each assignment: (1) good = full points; (2) pass = $\frac{1}{2}$ full points; (3) no pass = 0 points).

4. Weekly TA session to discuss topics and readings

Reading Material

The required reading is available as PDF files on the class website.

**THE ECONOMICS OF OCEAN RESOURCES
 READING LIST**

I. INTRODUCTION

1. Ocean Resources: An Overview

Required Reading	Willmann, R. and K. Kelleher. 2010. "Economic Trends in Global Marine Fisheries." Chapter 2 in Grafton, Hilborn, Squires, Tait, and Williams, eds., <i>Handbook of Marine Fisheries Conservation and Management</i> . Oxford University Press.
Optional Reading	"Troubled Waters: Special Report on the Sea" in <i>The Economist</i> , January 3, 2009, 16 pp.

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

2.1. Property Rights	
Required Reading	Squires, D. 2010 "Property and Use Rights in Fisheries." In R. Allen, J. Joseph, and D. Squires, editors, <i>Conservation and Management of Transnational Fisheries</i> . Blackwell Publishing.
Required Reading	Arriagada, R. and C. Perrings. 2011. Paying for International Environmental Public Goods. <i>Ambio</i> 40:798–806. (Discusses different types of public goods and implications for their provision.)
PowerPoint Lecture 1	Environmental Externalities and Market Failure_1
PowerPoint Lecture 2	Public Goods and Common Resources_2
PowerPoint Lecture 3	Property Rights_3
YouTube Video (optional)	Coase Theorem http://www.youtube.com/watch?v=pdz3rvfbNe4&feature=related
YouTube Video (optional)	How Markets Fail: Positive and Negative Externalities http://www.youtube.com/watch?v=Jax-ZyL7DkI&feature=related
YouTube Video (required)	Tragedy of the Commons http://www.youtube.com/watch?v=MLirNeu-A8I

2.2. Law of the Sea	
PowerPoint Lecture 4	Law of the Sea_4

II. THE ECONOMICS AND MANAGEMENT OF RENEWABLE MARINE RESOURCES

3. The Theory of Open Access and Bioeconomics

Required Reading	Wilen, J. "Life Histories of Organisms," pp. 77-84,89-94, in "Bioeconomics of Renewable Resource Use," Chapter 2 in A.V. Kneese and J.L. Sweeney, eds., <i>Handbook of Natural Resource and Energy Economics</i> , Vol. I. New York: Elsevier Science Publishers B.V., 1985.
Required Reading	Flaaten. <i>Fisheries Economics and Management</i> . Chapters 2 & 3.1-3.2., Chapter 5 through page 76.
Optional Reading	Squires, D. 2005. "Introductory Lecture on Bioeconomics, Parts I, II, III." <ul style="list-style-type: none"> • Word files available on class website.
PowerPoint Lecture	None available.
Assignment 1	Required. See below.
Assignment 2	Required. See below.
YouTube Videos (optional)	Various types of fishing methods Trawlers: http://www.youtube.com/watch?v=aAugBghv1Ck http://www.youtube.com/watch?v=7sqv9Xf8YIA&feature=related Longline: http://www.youtube.com/watch?v=err9JXTzymg Purse Seine: http://www.youtube.com/watch?v=348apH3pe3k Albacore Jig Fishing: http://www.youtube.com/watch?v=TUXum0Lnexg&feature=related Pole-and-Line: http://www.youtube.com/watch?v=lp_Rs75-5vl&feature=related http://www.youtube.com/watch?v=KlvsDYM0ABI&feature=related Crab Pots: http://www.youtube.com/watch?v=SsfDNNTNdFU&feature=related

Required Assignment 1	
Conceptual Background	Read Hardin <u>and</u> either (1) Wade or (2) Seabright (more theoretical than Wade; Seabright uses theory of repeating cooperative and noncooperative games).
Application. Either one is required of all students.	Read either (1) Acheson or (2) Cinner
Conceptual Assignment Reading. Required of all students.	Hardin, G. 1968. "Tragedy of the Commons." <i>Science</i> , 162: 1243-1248.
Conceptual Assignment	Wade, R. 1987. "The Management of Common Property Resources:

Reading. Read this or Seabright.	Finding a Cooperative Solution.” <i>World Bank Research Observer</i> 2(2): 219-234. <ul style="list-style-type: none"> pdf file is available on class website.
Conceptual Assignment Reading. Read this or Wade.	Seabright, P. “Managing Local Commons: Theoretical Issues in Incentive Design.” <i>Journal of Economic Perspectives</i> 7(4): 113-134.
Application Assignment Reading. Read this or Cinner.	Acheson J. 1975. “The Lobster Fiefs: Economic and Ecological Effects of Territoriality in the Marine Lobster Industry.” <i>Human Ecology</i> 3:183-207.
Application Assignment Reading. Read this or Acheson.	Cinner, J. 2005. “Socio-Economic Factors Influencing Customary Marine Tenure in the Indo-Pacific. <i>Ecology and Society</i> 10(1):1-36.
<u>Assignment</u>	4-page paper (typed, double spaced, 12 Arial font, 1” margins) discussing the possible use of common property to address the commons problem. Please develop your discussion within the context of either (1) Acheson and the lobster fiefs or (2) Cinner and customary marine tenure in the Indo-Pacific. Note: you don’t have to read Acheson if you read Cinner and vice versa, but in either case you should show evidence of having read Hardin and either Wade or Seabright.

Required Assignment 2	
Assignment	Problem Set No. 1

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

Required Reading	Flaaten. <i>Fisheries Economics and Management</i> . Chapter 3.3-3.4, Chapter 5.
Required Reading	Hannesson, <i>Rögnvaldur</i> . 2005. “The Privatization of the Oceans.” Chapter 2 in Donald R. Leal, ed., 2005, <i>Evolving Property Rights in Marine Fisheries</i> , Lanham: Md: Rowman and Littlefield.
Required Reading	Grafton <i>et al.</i> 2006. “Incentive-Based Approaches to Sustainable Fisheries,” <i>Canadian Journal of Fisheries and Aquatic Sciences</i> 63: 699-710.
Required Reading	Costello, C. S.D. Gaines and J. Lynham. 2008. “Can Catch Shares Prevent Fisheries Collapse?” <i>Science</i> 321: 1678-1681.
Required	Hilborn, R. Moving to Sustainability by Learning from Successful

Reading	Fisheries. <i>Ambio</i> 36(4): 296-303.
Required Reading	Hilborn, R. 2007. "Defining Success in Fisheries and Conflicts in Objectives." <i>Marine Policy</i> 31(2): 153-158.
Required Reading	Beddington, J.R., D.J. Agnew, and C.W. Clark. 2007. Current Problems in the Management of Marine Fisheries, <i>Science</i> , 316 (22 June):1713-16.
Required Reading	Grimm, D. et al. 2012. "Assessing Catch Shares' Effects: Evidence from Federal United States and Associated British Columbian Fisheries." <i>Marine Policy</i> 36(3): 644-657.
PowerPoint Lecture	ITQs_5 <ul style="list-style-type: none"> • Available on class website.
Video	<i>Empty Oceans, Empty Nets</i>
Computer Simulation	<i>Abasim</i>
YouTube Video (required)	<i>Allocation – Dale Squires</i> http://www.youtube.com/watch?v=FwZffYiLJ8Y
YouTube Video (required)	http://www.youtube.com/watch?v=B0AqI1re0FY <i>Saving Ocean Fisheries – Don Leal, PERC</i>
YouTube Video (required)	<i>Fisheries Management Disaster</i> http://www.youtube.com/watch?v=JStVLTyZhOU&feature=grec_index <i>(when you watch, think of community/common property vs. ITQs)</i>

5. Global Fisheries Issues (Could be after Midterm)

Required Reading	Pauly et al. "Fishing Down Marine Food Webs," <i>Science</i> Vol. 279 pp. 860-863 (February, 1998).
Required Reading	Pauly et al. "Towards Sustainability In World Fisheries," <i>Nature</i> Vol. 418 pp. 689-695 (August, 2002).
Required Reading	Worm, B. et al. 2006, "Impacts of Biodiversity Loss on Ocean Ecosystem Services," <i>Science</i> 314, 787-790.
Required Reading	Sanchirico, J. and J. Wilen. 2007. "Global Marine Fisheries Resources: Status and Prospects." <i>International Journal Global Environmental Issues</i> Vo. 7, No. 2/3.
Optional Reading	Anderson, G. et al. 2008. "Why Fishing Magnifies Fluctuations in Fish Abundance," <i>Nature</i> 452: 835-839.
PowerPoint Lecture	Global Fisheries Issues_6
Video	http://www.babelgum.com/html/clip.php?clipId=3020495
YouTube Video (required)	State of World Fisheries Parts 1,2,3 – Ray Hilborn http://www.youtube.com/watch?v=frfOi2P0wlo http://www.youtube.com/watch?v=etSjm0zZs9U&feature=related http://www.youtube.com/watch?v=J49rCgFo1Ko&feature=related
YouTube Video	Rebuilding Global Fisheries – Worm et al.

(optional)	http://www.youtube.com/watch?v=Zlsl-AkrPmo&feature=related
Video (optional)	Ray Hilborn http://www.uwv.org/video/player.aspx?dwrid=2515

MIDTERM EXAMINATION

Friday of Week 6, February 17

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

6. Common Resources, Impure Public Goods, Total Economic Value, Biodiversity, Ecosystems

Required Reading	Squires et al. in press. "Rethinking Marine Conservation: From Solving the Commons Problem to Conservation and Management of Impure Public Goods." <i>Conservation Biology</i> . Impure public goods framework
Required Reading	"Total Economic Value," pp. 129-137 in D. W. Pearce and R.K. Turner, 1990. <i>Economics of Natural Resources and the Environment</i> . London: Harvester Wheatsheaf.
Required Reading	Montero, T. and C. Perrings. 2011. "The Provision of International Environmental Public Goods." Paper No. 16, Division of Environmental Policy Implementation, United Nations Environment Program.
Required Reading	Aburto-Oropeza et al. 2008. Mangroves in the Gulf of California Increase Fishery Yields. <i>Proceedings of the National Academy of Sciences</i> 105(30): 10456-10459. <ul style="list-style-type: none"> • Illustrates ecosystem services.
PowerPoint Lecture	Conservation and Markets_7 (Reconciling Biodiversity Conservation with Markets and Resource Use)
PowerPoint Lecture	Mixed Goods and Public Bads_8
PowerPoint Lecture	Policies for Externalities_9

7. Dolphins

Required Reading	Hall, Martin. 1998. "An Ecological View of the Tuna-Dolphin Problem: Impacts and Trade-Offs," <i>Reviews in Fish Biology and Fisheries</i> , 8: 1-34.
Required Reading	Hall, M., M. Campa and and M. Gómez. 1979. "Solving the Tuna-Dolphin Problem in the Eastern Pacific Purse-Seine Fishery," <i>Ocean Yearbook</i> , Vol. 17. (Overlap between the two

	hall papers, so skim.)
Optional Reading	Gjertsen, H., M. Hall, and D. Squires. 2010.
PowerPoint Lecture	Dolphin-Tunas_10A
PowerPoint Lecture	Dolphin-Tunas_10B
YouTube Video for 10AB (optional)	Tuna Fishing, Parts I & II http://www.youtube.com/watch?v=qEuioCqTjjo&feature=fvsvr
PowerPoint Lecture	Ecological Trade-Offs in the ETP_11
YouTube Video for ETP_11 (required)	Ray Hilborn on sea- and land-based food http://www.youtube.com/watch?v=hjiZA4pDiPg

8. Whales

Required Reading	Schneider, V. and D. Pearce. 2004. "What Saved the Whales? An Economic Analysis of the 20 th Century Whaling." <i>Biodiversity and Conservation</i> 13(3): 543-562.
Required Reading	Iloff, Mike. 2008. "Compromise in the IWC: Is It Possible or Desirable?" <i>Marine Policy</i> 32(6): 997-1003.
Required Reading	Hirata, K. "Why Japan Supports Whaling." 2011. <i>Journal of International Wildlife Law & Policy</i> 8: 129-149.
Required Reading	Goodman, D. "The 'Future of the IWC': Why the Initiative to Save the IWC Failed." 2011. <i>Journal of International Wildlife Law & Policy</i> 14: 63-74.
Required Reading	Costello, C., L. Gerber, and S. Gaines. 2011. "A Market Approach to Saving the Great Whales." <i>Nature</i> 481: 139-140.
PowerPoint Lecture	Whales_12
Possible Guest Lecturer	

9. Coral Reefs

PowerPoint Lecture	Coral Reefs_13A Coral Reefs_13B
Reading	McClanahan, T.R., M.J. Marnane, J.E. Cinner, and W.E. Kiene. 2006. A comparison of marine protected areas and alternative approaches to coral-reef management. <i>Current Biology</i> 16(14): 1408-1413.

10. Sea Turtles

Required Reading	Dutton, P. and D. Squires. 2008. "Reconciling Fishing with Biodiversity: A Holistic Recovery Strategy for Pacific Sea Turtles," <i>Ocean Development and International Law</i> 39:200–222.
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Required Reading	Rausser, G., S. Hamilton, M. Kovach, and R. Stifter. 2009. Unintended Consequences: The Spillover Effects of Common Property Regulations. <i>Marine Policy</i> 33(1): 24-39.
Guest Lecture	
PowerPoint Lecture	Sea Turtles Econ 145_10A
PowerPoint Lecture	Sea Turtles Econ 145_10B
Videos	Various short clips, on class website