

Course Hours: MWF 4:00 – 4:50 PM**Classroom:** WLH 2001**Instructor:** Dale Squires
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Teaching Assistant Section (optional):

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| Course Dates: | Monday, January 9 – Friday, March 17 |
| Midterm: | Friday, February 17 |
| Assignment 1 Due Date: | Friday of week 3, January 27 |
| Midterm Review Session: | Monday, Feb. 13, 6pm-8pm |
| Assignment 2 Due Date: | Friday of week 8, March 3 |
| Final Review Session: | Sunday, March 19, 1pm-4pm |
| Final Exam Week: | Monday, March 13 - 19 |
| Final: | Friday, March 17, 3pm-6pm |

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| Holidays: | Martin Luther King Jr. Day, Monday, Jan 16 President's Day, Monday, Feb 20 |
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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 inter-temporal 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, Feb. 17 -- 40% of course grade.
 - Covers the concepts but not the mathematics of the bioeconomic model.
 - Review session, Monday, Feb. 13, 6pm-8pm
2. Final examination March 18-25 (unknown date) ○ 40% of course grade.
 - Covers all of the course material between the midterm and the class end, but not explicitly the material covered by midterm.
 - Review session, Sunday, March 19, 1pm-4pm
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 (impure public goods and biodiversity conservation). For each assignment: (1) good = 5 points; (2) pass = 2.5 points; (3) no pass = 0 points). You will have to upload a copy to TritonEd (note that TritonEd checks for plagiarism, duplicate essays among students, etc.).
 - Assignment 1 due date: Friday of week 3, January 27
 - Assignment 2 due date: Friday of week 8, March 3
4. Weekly TA session to discuss lectures and readings.
 - Dates, times, and location to be determined.

5. Weekly online quizzes except on week of exam or two short assignments, total of 7, for 10% of grade.

- Questions from online quizzes will be included on the exams.
- Lowest two quizzes dropped
- Questions are directly from lecture notes or conceptual in nature
- These are due 3 p.m. on the relevant Wednesday. Thus, week 1 quiz is due on week 2.
- You will have two attempts. Check the notes to correct any wrong answers.

Reading Material

- All of 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

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| Required Reading | <ul style="list-style-type: none"> 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 | <input type="checkbox"/> 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

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| 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 | 1.Environmental Externalities and Market Failure (1 lecture) |
| PowerPoint Lecture 2 | 2.Public Goods and Common Resources (1 lecture) |
| PowerPoint Lecture 3 | 3.Property Rights (2 lectures) |
| 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-ZyL7Dkl&feature=related |
| YouTube Video (optional) | Tragedy of the Commons http://www.youtube.com/watch?v=MLirNeu-A8I |

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| 2.2. Law of the Sea | |
| PowerPoint Lecture 4 | 4.Law of the Sea (1 lecture) |

II. THE ECONOMICS AND MANAGEMENT OF RENEWABLE MARINE RESOURCES

3. The Theory of Open Access and Bioeconomics

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| Required Reading | Wilens, 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 (Reference) | 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. |
| YouTube Videos (optional) | Various types of fishing methods Trawlers: http://www.youtube.com/watch?v=aAuqBghv1Ck 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_Rs75-5vI&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 | |
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| Due Date | Friday of Week 3, January 27 |
| Conceptual Background | Read Hardin and <i>either</i> (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 Reading. Read this or Seabright. | Wade, R. 1987. "The Management of Common Property Resources: 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> | <p>4-page paper (typed, double spaced, 12 Arial font, 1" margins) discussing the possible use of common property to address the commons problem.</p> <p>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.</p> |

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

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| Required Reading | Flaaten. <i>Fisheries Economics and Management</i> . Chapter 3.3-3.4, Chapter 5. |
| 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. |
| PowerPoint Lecture | 5.ITQs <ul style="list-style-type: none"> • Available on class website. |
| Video | <i>Empty Oceans Empty Nets</i> |
| Computer Simulation | <i>Abasim</i> |

5. Global Fisheries Issues (Could be after Midterm)

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| 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. |
| PowerPoint Lecture | 6.Global Fisheries Issues (1 lecture) |
| Video | http://www.babelgum.com/html/clip.php?clipId=3020495 |
| YouTube Video (optional) | 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 |
| 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 IN AN ECOSYSTEMS FRAMEWORK: DOLPHINS, WHALES, SEA TURTLES, AND CORAL REEFS

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

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| 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 | 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 | 7. Conservation and Markets (Reconciling Biodiversity Conservation with Markets and Resource Use) (1.5 lectures) |
| PowerPoint Lecture | 8. Impure Public (Mixed) Goods and Public Bads (2 lectures) |
| PowerPoint Lecture | 9. Policies for Externalities (2 lectures) |
| YouTube PES (optional/alternative explanation) | http://environment.yale.edu/teeb/policymakers/bruner/ |
| YouTube Ecosystem Services & Biodiversity (optional/alternative explanation) | http://environment.yale.edu/teeb/policymakers/rosenberg/ |

| Required Assignment 2 | |
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| Due Date | Friday of Week 8, March 3 |
| Conceptual Background | Read Arriagada and Perrings. 2011. Paying for International Environmental Public Goods. <i>Ambio</i> 40:798–806 Bulte, E., G. van Kooten, and T. Swanson. 2003. Economic Incentives and Wildlife Conservation. Working paper. |
| <u>Assignment</u> | 4-page paper (typed, double spaced, 12 Arial font, 1” margins) discussing incentives to conserve marine biodiversity conservation within the framework of impure public goods. The intent of the assignment to insure that you understand the conceptual framework for the rest of the class. Discuss what an impure public good is, the types of externalities associated with impure public goods, the technology of public good supply (best shot, weakest link, etc.), and the types of economic incentives (positive and negative) that are created for impure public goods with different technologies of public good supply. |

7. Marine Mammals: Dolphins

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| 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. |
| PowerPoint Lecture | 10.Dolphin-Tunas (1 lecture) Could be alternative guest lecture on marine mammals |
| YouTube Video for 10 (optional) | Tuna Fishing, Parts I & II http://www.youtube.com/watch?v=qEuioCqTjjo&feature=fvsvr |
| PowerPoint Lecture | 11.Ecological Trade-Offs in the ETP (1 lecture) |
| YouTube Video for ETP_11 (required) | Ray Hilborn on sea- and land-based food http://www.youtube.com/watch?v=hjiZA4pDiPg |

8. Whales

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| 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 | Costello, C., L. Gerber, and S. Gaines. 2011. "A Market Approach to Saving the Great Whales." <i>Nature</i> 481: 139-140. |
| Required Reading | Butler-Stroud, C. 2016. "What Drives Japanese Whaling Policy?" <i>Frontiers in Marine Science</i> 22 June 2016 http://dx.doi.org/10.3389/fmars.2016.00102 |
| PowerPoint Lecture | 12.Whales (2 lectures) |
| Video on Scientific Whaling by Marc Mangel | http://panopto.uw.edu/Panopto/Pages/Viewer.aspx?id=0512ca7b-0a3a-4929-8397-a9d1f03963f6 |

9. Coral Reefs

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| PowerPoint Lecture | 13A.Coral Reefs (1 lecture both 13A & 13B) 13B.Coral Reefs |
| 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

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| 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. |
| Guest Lecture | Peter Dutton unless scheduling conflict |
| PowerPoint Lecture | 14A.Sea Turtles Econ 145 (3 lectures total) |
| PowerPoint | 14B.Sea Turtles Econ 145 |

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| Lecture | |
| Video | https://www.dropbox.com/s/lmtgv22vlwr2uu4/saving%20sea%20turtles.mov |