FAS 6705 Fisheries and aquaculture: An economics perspective

1 Course Overview

Short description:

This course introduces students to important issues in fisheries and aquaculture management from an economic perspective, exploring the incentives of various stakeholders in utilizing and conserving fisheries resources, as well as the impacts and effects of differing management systems on industry and ecosystems. Appropriate for students with little or no background in economics or fisheries sciences.

2 Overview

In many ways the oceans and our waterways are the last frontier. Fisheries are the last major hunting industry, and fishing is also an important recreational activity. During recent decades, global aquaculture production has exploded and has now surpassed fisheries as a source for food, primarily due to new technologies and knowledge that create new opportunities. At the same time, these evolving industries create new pressures on the ecosystem.

To a large extent, the use of the ocean and water resources is about exploiting economic opportunities, given the constraints provided by the natural resources in the system. Since these opportunities involve the use of public natural resources, it is not surprising that there are a number of conflicts between different user groups such as aquaculture producers, commercial fishers, conservationists, consumers, environmentalists, fisheries managers and recreational fishers.

Lectures and discussions are used to introduce students to key concepts and methods, and follow-up discussions will be provided in class. Please note that there will not be a class every week. The class dates can be found in Section 5. Prepared questions are encouraged for class participation.

- 3 Credits
- Fall 2025
- Pre-recorded lectures with face-to-face class meetings (synchronous virtual participation available). Class meetings will be Tuesdays at 4.05pm at NZH 222 at the scheduled dates.
- Canvas site is available at http://ufl.instructure.com or http://elearning.ufl.edu

Course Prerequisites: None

Instructor: Dr. Frank Asche (Professor), G099 at McCarty B, email: frank.asche@ufl.edu

- Office hours: Tuesdays, 2-4. Additionally available by email or phone by appointment.

Textbook(s) and/or readings: There is no required text for the course. Selected readings from primary literature are included in Reading List below.

3 Learning Outcomes

At the end of this course, each student will be able to:

- Describe economic opportunities in in the production, use and conservation of seafood resources.
- Describe ways fishers and aquaculturists may create environmental externalities that lead to exploitation of the ecosystem.
- Describe methods by which management systems can protect natural resources.
- Analyze the impacts of management systems design relative to various stakeholder interests.
- Analyze the economic and market effects of various management systems.
- Evaluate costs and benefits associated with various uses of fisheries and coastal resources.
- Evaluate the impact of international trade on fisheries and coastal resources.

4 Course Logistics

Students may access lectures, assignments, readings, and supporting materials through the course Canvas site as they become available.

Technology Requirements:

- A computer or mobile device with high-speed internet connection.
- A webcam, headset and/or microphone, and speakers.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser. What browser am I using?
- Installation of proctoring software may be required and will be provided if so.

Synchronous online sessions may be recorded. By sharing your video, screen, or audio during any synchronous online class sessions, you are consenting to being recorded for the benefit of students who cannot attend live as well as for class review during the current semester. If you have special circumstances or concerns about privacy, it is your responsibility to discuss it with your instructor.

4.1 Description of Assessments & Activities

Reading Reflections.

Throughout the semester, you will be expected to complete four (4) of six (6) possible reflection papers on assigned readings. These reflections should be 1-2 pages in length and should provide evidence of critical thinking about the literature with clear evidence of basing the arguments in the recommended readings, questions you may have in relation to the topic, unaddressed issues in the science or policy, etc. Citation is required, and additional references to the required readings are encouraged but not required.

- Each reflection is worth 11.25% of the total grade for a total of 45%.

Reflection topics
1. Why is so much seafood traded? Discuss the importance of demand as well as supply factors:
Due date: September 26, 2025

2. Fisheries management: Is an outcome that is environmentally, economically and socially sustainable possible?
Due date: September 26, 2025

3. Recreational fisheries: Are they different?
Due date: October 23, 2025

4. Aquaculture: Good, bad or a mix depending on technologies, markets, etc.?
Due date: October 23, 2025

5. Is there any reason to believe the sustainable seafood movement makes any difference? If so, how?
Due date: November 20, 2025

6. Discuss one topic based on the lecture series.
Due date: November 20, 2025

Case Study Project/Writing Assignment.

A significant portion of the grade is a paper where the student chose a case to analyze based on the materials provided in the course. This paper will be split into two (2) submissions:

- Initial topic and case study site selection (participation grade), Due date: September 28, 2025
- Final paper (50%), including at least the following sections:
    - Introduction
    - Background
    - Analysis
    - Recommendations
    - References

The final submission should be between 10-15 pages not including references. Use correct *Marine Resource Economics* journal style for citations and writing. See rubric in Canvas Assignments for more details.

Due date: December 11, 2025

Participation.

Attendance at all course meetings (virtual or face-to-face) is expected.

4.2 Grades & Grading Scale

5%	Initial topic submission, and participation in discussions
45%	Reflection papers (4 required out of 6 possible, 11.25% each)
50%	Case study: Final submission of complete case study

Grades will be allocated as: A (93-100%), A- (90-92%), B+ (88-89%), B (81-87%), B- (78-80%), C+ (74-77%), C (67-73%), C- (63-66%), D+ (59-62%), D (55%-58%), D- (51-54%), E (<50%). Rounding to the nearest whole.

For information on current UF policies for assigning grade points, see
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

5 Learning Content

Lecture no.	Topics
1	• Introduction • Important challenges for utilization and conservation of seafood • Background on some of the conflicts • The economic incentives: Opportunities and challenges • Lecture available: August 22; Class: August 26.
2	• Overview of global and U.S. seafood production and consumption including aquaculture and fisheries as production technologies • Overview of global seafood production • Why trade? • Livelihoods and communities • Lecture available: August 22; Class: September 2.
3	• The tragedy of the commons, causes and consequences • The benefits of regulating fisheries in the environmental and economic dimensions • Lecture available: August 29; Class: September 9.
4	• Fisheries regulations and incentives • Command and control • The race to fish • Overcapacity and subsidies • Lecture available: September 5; Class: September 16.
5	• Fisheries regulations and incentives • Individual Fishing Quotas • Quota Transferability • Lecture available: September 12; Class: September 16.
	Reading reflections
6	• Recreational fishing • Conservation and hatcheries • Competition between recreational and commercial fishers • Lecture available: September 26; Class: September 30.
7	• Aquaculture: Farming not hunting • Why does aquaculture production grow so rapidly? • Lecture available: October 3; Class: October 7.

8	• Aquaculture: Environmental issues, regulation and livelihoods • Why is not much farmed fish being produced in the U.S.? • Lecture available: October 10; Class: October 14.
	Reading reflections
9	• Markets • Lecture available: October 18; Class: October 28.
10	• Supply chains • Lecture available: October 23; Class: October 28.
	Reading reflections
11	• Seafood trade • Lecture available: October 30; Class: November 18.
12	• The sustainable seafood movement • Eco-labeling • Lecture available: November 6; Class: November 18.
13	• Illegal, unreported and unregulated (IUU) fishing • High-seas stocks: Exploitation and management • Lecture available: November 13; Class: November 18.
14	Work on final paper. Class: Tue, Dec 2

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6.1 Readings

Lecture 1.

Asche, F. and M.D. Smith (2018) Induced Innovation in Fisheries and Aquaculture. *Food Policy*. 76(April), 1-7.

Love, D.C., F. Asche, Z. Conrad, R. Young, J. Harding, R. Neff (2020) Food Sources and Expenditures for Seafood in the United States. *Nutrients*, 12(6), 1810.

Love, D.C., F. Asche, R. Young, E.M. Nussbaumer, J.L. Anderson, R. Botta, Z. Conrad, H.E. Froehlich, T.M. Garlock, J.A. Gephart, A. Ropicki, J.S. Stoll, A.L. Thorne-Lyman (2022) An Overview of Retail Sales of Seafood in the United States, 2017-2019. *Reviews in Fisheries Science and Aquaculture*. 30(2), 259-270.

Lecture 2.

Asche, F. C. A. Roheim and M.D. Smith (2014) Markets, Trade, and Seafood. In *Encyclopedia of Natural Resources* (ed Y. Wang). CRC Press, pp. 791-797.

Knapp. G. (2017) A fishy introduction to Economics. Unpublished manuscript.

Filipski, M., and B. Belton (2018) Give a Man a Fishpond: Modeling the Impacts of Aquaculture in the Rural Economy. World Development 110, 205-223.

Lectures 3-5.
Hardin, G. 1968. The Tragedy of the Commons. *Science* 162:1243-47.

Ostrom, E. 1999. Coping with tragedies of the commons. Ann. Rev. Polit. Sci. 2: 493–535.

Wilen, J. E. (2006) "Why Fisheries Management Fails: Treating Symptoms Rather than Causes", Bulletin of Marine Science, 78: 529-546.

Asche, F., J. L. Anderson and T. M. Garlock (2018) Food from the water – Fisheries and Aquaculture. In G.L. Kramer, K.P. Paudel and A. Schmitz (ed.) The Routledge Handbook of Agricultural Economics. Routledge, NY, pp. 134-159.

Lecture 7.
Fenichel, E., J. K. Abbott and B. Huang (2013) Modelling angler behaviour as a part of the management system: synthesizing a multi-disciplinary literature. Fish and Fisheries, 14, 137-157.

Arnarson, R (2012), Managing Commercial and Recreational Fisheries: Issues and challenges

Lectures 8-9.
Asche, F., J. L. Anderson and T. M. Garlock (2018) Food from the water – Fisheries and Aquaculture. In G.L. Kramer, K.P. Paudel and A. Schmitz (ed.) The Routledge Handbook of Agricultural Economics. Routledge, NY, pp. 134-159.

Asche, F. (2008) Farming the Sea. *Marine Resource Economics*, 23(4), 527-547.

Garlock, T., F. Asche, J.L. Anderson, T. Bjørndal, G. Kumar, K. Lorenzen, A. Ropicki, M. D. Smith and R. Tveterås (2020) A Global Blue Revolution: Aquaculture Growth across Regions, Species, and Countries. *Reviews in Fisheries Science and Aquaculture*. 28(1), 107-116.

Knapp, G., & Rubino, M. C. (2016). The political economics of marine aquaculture in the United States. *Reviews in Fisheries Science and Aquaculture*, *24*(3), 213–229.

Kobayashi, M., Msangi, S., Batka, M., Vannuccini, S., Dey, M. M., & Anderson, J. L. (2015). Fish to 2030: The role and opportunity for aquaculture. *Aquaculture Economics & Mana*gement, 193, 282-300.

Naylor, R.L., Hardy, R.W., Buschmann, A.H., Bush, S.R., Cao, L., Klinger, D.H., Little, D.C., Lubchenco, J., Shumway, S.E., and Troell, M. A 20-year retrospective review of global aquaculture. *Nature*, **591**, 551 (2021).

Tveterås, S. (2002). Norwegian salmon aquaculture and sustainability: The relationship between environmental quality and industry growth. *Marine Resource Economics* 17(1): 121–132.

Lectures 10-12.
Anderson, J.L. (2002). Aquaculture and the future. *Marine Resource Economics* 17(2): 133–152.

Asche, F., J. L. Anderson and T. M. Garlock (2018) Food from the water – Fisheries and Aquaculture. In G.L. Kramer, K.P. Paudel and A. Schmitz (ed.) The Routledge Handbook of Agricultural Economics. Routledge, NY, pp. 134-159.

Lecture 13-14.
Fonner, R., & Sylvia, G. (2015). Willingness to Pay for Multiple Seafood Labels in a Niche Market. *Marine Resource Economics, Vol. 30*, 51-70.

Roheim, C. A. An Evaluation of Sustainable Seafood Guides: Implications for Environmental Groups and the Seafood Industry. *Marine Resource Economics* **24**, 301-310 (2009).

Tlusty, M. F. Environmental improvement of seafood through certification and ecolabelling: theory and analysis. *Fish and Fisheries* **13**, 1-13

7 Policies and Requirements

This course plan and syllabus are subject to change in response to student and instructor needs. Any changes will be clearly communicated in advance through Canvas. The most current information on CALS policies can be found here: https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

7.1 Late Submissions & Make-up Requests

It is the responsibility of the student to access on-line lectures, readings, quizzes, and exams and to maintain satisfactory progress in the course. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues MUST be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number—352-392-HELP = 352- 392-4357 (option 2).

7.2 Communication Courtesy and Professionalism

Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. **Respect for individual differences and alternative viewpoints will be maintained in this class at all times.** All members of the class are expected to follow rules of common courtesy, decency, and civility in all interactions. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students' Office.

7.3 Semester Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning.

At approximately the mid-point of the semester, the School of Forest Resources & Conservation will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required but encouraged. This is not the UF Faculty Evaluation!

At the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

7.4 Academic Honesty Policy

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."*

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied*: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless them instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct or appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated.

Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

7.5 Inclusive Learning Environment

This course embraces the University of Florida's Non-Discrimination Policy, which reads,

> *The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act.*

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: http://multicultural.ufl.edu.

7.6 Services for Students with Disabilities:

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

7.7 Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

8 Campus Helping Resources

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- Learning-support@ufl.edu | (352) 392-HELP - select option 2 | http://elearning.ufl.edu
- Library Help Desk support http://cms.uflib.ufl.edu/ask
- SFRC Academic Hub https://ufl.instructure.com/courses/303721

8.1 Student Life, Wellness, and Counseling Help

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling and Wellness resources http://www.counseling.ufl.edu/cwc/
- U Matter, We Care http://www.umatter.ufl.edu/

- Career Connections Center http://career.ufl.edu/
- Other resources are available at http://www.distance.ufl.edu/getting-help for online students.

8.2 Student Complaint Process

The School of Forest Resources & Conservation cares about your experience and we will make every effort to address course concerns. We request that all of our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered.

If you have a more urgent concern, your first point of contact should be the SFRC Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- Students in online courses: http://www.distance.ufl.edu/student-complaint-process
- Students in face-to-face courses: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/