MBF 571: Fisheries Ecosystems: Management and Conservation

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Instructor.
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Prerequisites: None.

Course Description

Fisheries provide an important source of income and food security, as well as recreational opportunities. At the same time, they have the potential to deplete fish populations and cause incidental damage to marine ecosystems. Fisheries management is the process that has evolved to ensure that fisheries operate in a manner that not only provides the immediate benefits but also does not result in excessive or irreversible damage to the exploited fish stocks or the diversity, integrity and structure of the ecosystem, so that the stock and ecosystem will continue to provide the full range of benefits in the future (Cochrane & Garcia, 2009). In this course students will learn how fisheries management works to achieve these objectives. The primary focus will be on how fisheries interact with marine ecosystems, including how particular fisheries management measures influence fishing mortality rates. Nevertheless, the ecosystem-based approach to fisheries management (Sinclair and Valdimarsson, 2002) requires seeing fisheries as integrated systems, so it will also be necessary to discuss social, economic and legal aspects of fisheries management. Case studies will be used to demonstrate why some fisheries management systems have succeeded while others have failed. The course work will include a mix of reading assignments from two books the peer reviewed literature, as well as case studies involving fisheries and management activities such as guest lectures from local experts on fishery management from Federal, State and local fisheries and environmental management agencies.

There will also be two field trips to observe fishery data collection and the fishery management process. Last year the field trips were a canoe trip to the ten thousand islands area of the Everglades National Park and a fishing trip to the Gulf Stream on board a sport fishing charter boat.
Lectures

1. Introduction (Reading: Cochrane & Garcia 2009, in Cochrane & Garcia, Chapter 1, FAO 1995) and Jan 17. Term paper assignment.
2. Biology and Ecology Considerations for the Fishery Manager (Reading: Sadovy de Mitcheson 2009 in Cochrane & Garcia, Chapter 2) Jan 19
3. The Functioning of Marine Ecosystems (Reading: Sinclair & Valdimarsson, Chapter 7, Thrush and Dayton 2010) Jan 24
5. Economic Principles: An Economic Perspective on Fishing (Reading: Eide 2009 in Cochrane & Garcia, Chapter 4; Smith 2010) Jan 31
6. Legal Aspects (Reading: Kuemlangan 2009, in Cochrane & Garcia, Chapter 5) F 2
7. U.S. Federal and state law (Prager and Shertzer 2010) F 7. IUCN assignment ( )
8. The Fishery Management Institutions (Reading: Feral 2009, in Cochrane & Garcia, Chapter 6; Berkes 2010) F 9
9. Guest lecture – Chris Liese NMFS - F 14
10. Area and Time Restrictions (Reading: Hall 2009, in Cochrane & Garcia, Chapter 8; Field et al. 2006) (F 16)
11. Case study visit for assignment #1 TBA F 21
12. Regulation of Fishing Gears and Methods (Reading: Bjordal 2009, in Cochrane & Garcia, Chapter 7; Jennings and Revill 2007) F 23
14. Rights-Based Fisheries Management: The Role of Use Rights (Reading: Charles 2009, in Cochrane & Garcia, Chapter 10; Branch 2009) Mar 1
15. Partnerships in Management (Reading: Pinkerton 2009, in Cochrane & Garcia, Chapter 11; Fujita et al. 2010) Mar 6
18. Galapagos Fishery case study. Mar 22
20. Field trip TBA. Mar 29
22. The Magnitude and Impact of By-Catch Mortality by Fishing Gear (Reading: Sinclair & Valdimarsson, Chapter 13) Apr 5
23. Guest Lecture: TBA Apr 10
24. The Effects of Fishing on Species and Genetic Diversity (Reading: Sinclair & Valdimarsson, Chapter 14) Apr 12
25. The Effects of Fishing on Non-Target Species and Ecosystem Structure and Function (Reading: Sinclair & Valdimarsson, Chapter 15, Rochet and Trenkel 2003, Worm et al. 2006) Apr 17
26. Student presentation of term papers and wrap-up discussion Apr 19
27. Protected species management (Wallace et al. 2010, other readings TBD) Apr 24
29. Final May 2.

Course assignments

1. Marine reserves and local fisheries simulator (http://ncep.amnh.org/marine_simulation/)
2. Attend a fishery management council or stock assessment meeting
3. Participate in scientific study of shark fisheries
4. Term paper: case study of a fishery

Course grading

Assignments 40%
Term paper 30%
Final exam 30%

Books:


Journal articles:
Ca y J.F. and Seijo J.C. 2005. This is more difficult than we thought! The responsibility of scientists, managers and stakeholders to mitigate the unsustainability of marine fisheries. Phil. Trans. R. Soc. B (2005) 360, 59–75.
Pitcher T.J. and M. E. Lam. 2010. Fishful Thinking: Rhetoric, Reality, and the Sea Before Us
Eco-logy and Society 15:12