

FAS 6355c Fisheries Management

Course Syllabus, Fall 2011, 4 Credits

Lectures: Monday and Wednesday 09:00 AM – 10:25 AM, 222 Newins-Ziegler Hall

Lab: Monday 3:00 - 5:30 PM, 104 Leigh Hall

Course Description

Fisheries are an important source of food and recreational opportunities, yet many are in poor shape due to overfishing and/or habitat degradation. Managing fisheries sustainably and restoring fisheries that have been degraded is a complex task that requires a broad set of competencies from fisheries professionals. The course aims to help students develop key competencies including knowledge of essential ecological, social, institutional, and economic dimensions of fisheries management; skills in resource assessment and modeling, interview and social survey techniques, institutional analysis, and participatory planning and to foster motivation for shared problem solving in an interdisciplinary and participatory manner, critical thinking and innovation. Lectures will be used to outline key concepts and approaches, and laboratories will provide experience in applying key methods. Students will reflect on the management context of their own research topic (or an issue of their choice) and conduct an integrative, interdisciplinary group project to explore options for improving the management of a Florida fisheries issue. This interdisciplinary course is intended for graduate students majoring in any subject relevant to fisheries management including fisheries/aquatic science, wildlife, resource economics, geography, and political science.

Course Objectives

The major objectives are for students to:

- 1) Appreciate the complex, multi-dimensional nature of fisheries management problems and the benefits of integrative-interdisciplinary approaches to addressing them
- 2) Understand key relevant concepts in the areas of fisheries ecology, stakeholder characteristics and behavior, governance systems, fisheries economics, and management and planning processes
- 3) Gain practical skills in fisheries assessment, interview techniques, institutional analysis, economic analysis, and participatory planning
- 4) Reflect on the wider management or conservation context of their research problem (or an issue of their choice)
- 5) Strengthen group work, communication, facilitation and reporting skills.

Instructor

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E-learning support

Sakai site available

Guest lecturers

Dr. Mike Allen, Fisheries and Aquatic Sciences, UF (black bass management plan)
Dr. Dan Canfield, Fisheries and Aquatic Sciences, UF (participatory lake management)
Shepherd Grimes, General Counsel, NOAA (fisheries law)
Dr. Sherry Larkin, Food and Resource Economics, UF (fisheries economics)
Dr. Martha Monroe, SFRC, UF (communication and education)
Dr. Taylor Stein, SFRC, UF (quantitative social surveys)
Dr. Juliane Struve, Fisheries and Aquatic Sciences, UF (habitat issues)

General Readings

There are no required text books, but students may refer to the following for many aspects of the course:

Charles, A.T. 2001. *Sustainable Fishery Systems*. Wiley-Blackwell, London.
Haddon, M. 2001. *Modelling and Quantitative Methods in Fisheries*. Chapman and Hall, London.

Assessment & Grading

A variety of different assessment approaches will be used, with emphasis on evaluating understanding of key concepts, development of core skills, critical thinking, and creative problem solving. The different assessments and their weighting are:

Lab reports (3)	15%
Essay on fisheries problem	20%
Report on integrative group project	45%
Take-home final exam	<u>20%</u>
Total	100%

The grading scale is as follows:

Letter Grade	Grade Points
A	4.0
A-	3.67
B+	3.33
B	3.0
B-	2.67
C+	2.33
C	2.0
C-	1.67

Lab reports

Three lab reports are required:

- 1) Fisheries assessment: biomass dynamics modeling. Due 09/14/2011.
- 2) Qualitative stakeholder interviews. Due 10/10/2011.
- 3) Bio-economic modeling. Due 10/31/2011.

Presentation and essay on the management context of the student's research problem or interest

Throughout the first half of the course, students will develop an essay on a fisheries problem of their choice – usually one related to your M.S. or Ph.D. research. Students will define the problem, set out its ecological and human dimensions, and identify promising approaches to addressing the problem including for example: focused research, education, changes in governance, etc. This exercise will help you reflect on the management or conservation context of their research and to integrate what they have learned in the course. Limit: 2000 words. Due 11/07/2011.

Integrative group project

In the integrative group project, students will work to provide a fresh, independent perspective on a current fisheries management problem. This will involve (1) identifying the problem and scoping the analysis; (2) in-depth analyses of the ecological, social, institutional and economic facets of the problem; and (3) proposing and evaluating possible solutions. Students will undertake integrative activities (1, 3) in a large group but split into sub-groups for in-depth

analyses (2) which will require modeling, stakeholder interviews, etc. The project will lead to a consultancy-style report that will be shared with participating stakeholders and made publicly available. The mark for the group project will comprise elements awarded for sub-group analytical chapters (30% of total course mark) and for whole-group integrative elements (15% of total course mark). Limit: 4000 words for sub-group chapters, 2000 words each for introduction and synthesis sections. Due 12/10/2011.

Take-home exam

There will be one open-book, take-home exam at the end of the course. The exam will test knowledge and skills acquired during the course and the student's ability to bring these to bear on a new problem.

Academic honesty

All students are required to abide by the Academic Honesty Guidelines which have been accepted by the University of Florida:

(<http://www.dso.ufl.edu/judicial/procedures/honestybrochure.html>).

Failure to comply strictly to these guidelines can result in failure of the course.

UF Counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals which interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual assault counseling; and
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Accommodations for Students with Disabilities

Students requesting classroom or laboratory 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.

Lecture and lab schedule

Week	Date	Topic	Required/recommended reading
1	8/22 Lecture	Fisheries in trouble: why, where, when?	Worm et al. 2009; Welcomme et al 2010; FAO 2010
	8/22 Lab	Introductions and discussion of student's interests and research topics	
	8/24 Lecture	Understanding fisheries systems	Lorenzen 2008; Garcia & Charles 2008; Daniels et al. 2009; Hilborn 2007(a)
2	8/29 Lecture	Fisheries assessment I (biomass dynamic models)	Cooper 2006; Hilborn & Walters 1992; Haddon 2001;
	8/29 Lab	Fisheries assessment exercises I	
	8/31 Lecture	Population and community ecology of fisheries resources	Jennings et al. 2001 Essington et al. 2006
3	9/05 Lecture	Labor Day – no lecture	
	9/05 Lab	Labor Day – no lab	
	9/07 Lecture	Fisheries habitat ecology (Juliane Struve)	Langton et al. 1996; Rice 2005
4	9/12 Lecture	Fisheries assessment II (age structured models)	Cooper 2006; Hilborn & Walters 1992; Haddon 2001
	9/12 Lab	Fisheries assessment exercises II	
	9/14 Lecture	Fisheries assessment III (Reference points and management procedures)	Gabriel & Mace 1999; Froese 2004
5	9/19 Lecture	Governance and management systems	Hilborn et al. 2005; Ostrom 2007; Pomeroy & Berkes 1997
	9/21 Lab	Presentations on management context of student's research topic or interest	
	9/21 Lecture	Stakeholders as individuals: values, attitudes and behaviors	Arlinghaus & Mehner 2006
6	9/26 Lecture	Qualitative interview studies	Weiss 1994
	9/26 Lab	Interviewing exercises	
	9/28 Lecture	Stakeholders in governance: characteristics, interests, influence	Grimble & Chan, 1995 Smith et al. 2005
7	10/03 Lecture	Quantitative surveys (Taylor Stein)	Dillman et al. 2009
	10/03 Lab	Quantitative survey exercises	
	10/05	The role of law in Federal fisheries	

	Lecture	management (Shepherd Grimes)	
8	10/10 Lecture	Economics of fisheries management (Sherry Larkin)	Conrad 1999 (Ch. 3)
	10/10 Lab	Discussion of background for Gulf Council SSC meeting	Documents will be on the FTP server at www.gulfcouncil.org
	10/12 Lecture	Gulf Council SSC Meeting (class will attend in person or via video link)	
9	10/17 Lecture	Reforming fisheries management: change, processes, and the role of fisheries professionals	Hilborn 2007(b)
	10/17 Lab	Bio-economic modeling exercise	
	10/19 Lecture	Communication strategies for working with stakeholders (Martha Monroe)	Kaplan & Kaplan 2009, Monroe et al. 2009
10	10/24 Lecture	Alternative fishing regulations and their biological, social and economic consequences	Sutinen 1999
	10/24 Lab	Group project (session 1)	
	10/26 Lecture	Uncertainty, precaution and adaptive management	Charles 2001 (Ch. 11), Walters 1996, 2007
11	10/31 Lecture	Ecosystem-based management: dealing with diversity and complexity	Francis et al. 2006
	10/31 Lab	Group project (session 2)	
	11/02 Lecture	Allocation of resources and conflicts in fisheries	Charles 2001 (Ch. 13), Edwards 1990
12	11/07 Lecture	Spatial fisheries management and marine spatial planning	Fogarty & Botsford 2007; Lorenzen et al. 2010(a)
	11/07 Lab	Group project (session 3)	
	11/09 Lecture	Recreational fisheries management	Arlinghaus et al. 2007
13	11/14 Lecture	Black bass management in Florida (Mike Allen)	FWC (2011)
	11/14 Lab	Group project (session 4)	
	11/16 Lecture	Dealing with external pressures: habitat, water allocation, pollution	Lorenzen et al. 2006
14	11/21 Lecture	Hatchery programs in fisheries enhancement and restoration	Lorenzen et al 2010(b)
	11/21 Lab	Group project (session 5)	
	11/23 Lecture	Where there is no data and no government: managing small-scale fisheries in developing countries	Allison & Ellis 2001; Smith et al. 2005; Prince 2010
15	11/28	Participatory appraisal, learning	Chambers 1993; Pido et al.

	Lecture	and action	1996
	11/28 Lab	Group project (session 6)	
	11/30 Lecture	Co-operative management of Florida lakes (Canfield)	Canfield & Canfield 1994
16	12/05 Lecture	Sustainability and resilience in fisheries systems	Charles 2001 (Ch. 10&15)
	12/05 Lab	Group project (session 7)	
	12/07 Lecture	Synthesis – ten commandments for integrative fisheries scientists	

Key readings

- Allison, E. H. & Ellis, F. (2001) The livelihoods approach and management of small-scale Fisheries. *Marine Policy* 25: 377-388.
- Arlinghaus, R. & Mehner, T. (2006) Determinants of management preferences of recreational anglers in Germany: Habitat management versus fish stocking. *Limnologica* 35: 2-17.
- Arlinghaus, R., S.J. Cooke, J. Lyman, D. Policansky, A. Schwab, C. Suski, S.G. Sutton, and E.B. Thorstad. (2007) Understanding the complexity of catch-and-release in recreational fishing: an integrative synthesis of global knowledge from historical, ethical, social, and biological perspectives. *Reviews in Fisheries Science* 15: 75-167.
- Canfield, S.L. & Canfield, D.E. (1994) The TEAM approach, "Together for Environmental Assessment and Management": a process for developing effective lake management plans or water resource policy. *Lake and Reservoir Management* 10: 203-202.
- Chambers, R. (1993) Rural Appraisal: Rapid, Relaxed and Participatory. *IDS Discussion Paper* 311.
- Charles, A. T. (2001) *Sustainable Fishery Systems*. Oxford: Blackwell Science.
- Conrad, J.M. (1999) *Resource Economics*. Cambridge University Press.
- Cooper, A. (2006) *Guide to Fisheries Stock Assessment: from Data to Recommendations*. University of New Hampshire/NH Sea Grant.
- Daniels, S., Emborg, J. & Walker, G. (2009) Unifying Negotiation Framework 1.0: An Organizing Metanarrative of Policy Discourse. UNF Research. Available at: http://works.bepress.com/steven_daniels/2
- Dillman, D.A., Smyth, J.D. & Christian, L.M. (2009) *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Wiley: Hoboken, N.J. 499 pp.
- Edwards, S.F. (1990) *An Economics Guide to Allocation of Fish Stocks between Commercial and Recreational Fisheries*. NOAA Technical Report NMFS 94
- Essington, T. E., A. H. Beaudreau, and J. Wiedenmann. (2006) Fishing through marine food webs. *Proceedings of the National Academy of Science* 103:3171-3175.
- FAO (2010) *State of World Fisheries and Aquaculture*. Rome, FAO.
<http://www.fao.org/docrep/013/i1820e/i1820e.pdf>
- Fogarty, M.J. & Botsford, L.W. (2007) Population connectivity and spatial management of marine fisheries. *Oceanography* 20: 112-123.

- Francis, R.C., Hixon, M.A., Clarke, M.E., Murawski, S.A. & Ralston, S. (2007) Ten commandments for ecosystem-based fisheries Scientists. *Fisheries* 32: 217-233.
- Froese, R.(2004) Keep it simple: three indicators to deal with overfishing. *Fish and Fisheries* 5: 86–91
- FWC (2011) Black bass management plan. Tallahassee, Florida Fish and Wildlife Conservation Commission. <http://myfwc.com/media/1384317/BlkBassFINAL.pdf>
- Gabriel, W.L. & Mace, P.M. (1999) A Review of Biological Reference Points in the Context of the Precautionary Approach. NOAA Tech. Memo. NMFS-F/SPO-40.
- Garcia, S.M. & Charles, A.T. (2007) Fishery systems and linkages: from clockwork to soft watches. *ICES Journal of Marine Science* 64, 580-587.
- Grimble, R. & Chan, M. K. (1995) Stakeholder analysis for natural resource management in developing countries. *Natural Resources Forum*, **19**: 113-124.
- Haddon, M. 2001. *Modelling and Quantitative Methods in Fisheries*. Chapman and Hall, London.
- Hilborn, R. (2007a) Defining success in fisheries and conflicts in objectives. *Marine Policy* 31: 153-158.
- Hilborn, R. (2007b) Moving to sustainability by learning from successful fisheries. *Ambio*, 36: 296-303.
- Hilborn, R. & Walters, C. (1992) *Quantitative Fisheries Stock Assessment*. New York: Chapman & Hall.
- Hilborn, R., Orensanz, J. M. & Parma, A. M. (2005) Institutions, incentives and the future of fisheries. *Philosophical Transactions of the Royal Society B*, **360**: 47-57.
- Kaplan, S. & Kaplan, R. (2009) Creating a larger role for environmental psychology: The Reasonable Person Model as an integrative framework. *Journal of Environmental Psychology* 29: 329-339.
- Langton, R.W., Steneck, R.S., Gotceitas, V., Juanes, F. & Lawton, P. (1996) The interface between fisheries research and habitat management. *North American Journal of Fisheries Management* 16: 1-7.
- Lorenzen, K. (2008) Understanding and managing enhancement fisheries systems. *Reviews in Fisheries Science* 16:10-23.
- Lorenzen, K., Steneck, R.S., Warner R.R., Parma, A.M., Coleman, F.C. & Leber, K.M. (2010a) The spatial dimensions of fisheries: putting it all in place. *Bulletin of Marine Science* 86: 169-177.
- Lorenzen, K., Leber, K.M. & Blankenship, H.L. (2010b) Responsible approach to marine stock enhancement: an update. *Reviews in Fisheries Science* 18: 189-210.
- Monroe, M.C., Oxarat, A., McDonell, L. & Plate, R. (2009) Using community forums to enhance public engagement in environmental issues. *Journal of Education for Sustainable Development* 3: 171-182.
- Ostrom, E. (2007) A diagnostic approach for going beyond panaceas. *Proceedings of the National Academy of Science* 104: 15181-15187.
- Pido, M. D., Pomeroy, R. S. Garces L. R. & Carlos, M. B. (1996) *A Handbook for Rapid Appraisal of Fisheries Management Systems*. Manila, ICLARM.
- Pomeroy, R. S. & Berkes, F. (1997) Two to tango: the role of government in fisheries co-management. *Marine Policy* **21**: 465-480.

- Prince, J. (2010) Rescaling fisheries assessment and management: a generic approach, access rights, change agents, and toolboxes. *Bulletin of Marine Science* 86: 197-220.
- Rice, J.C. (2005) Understanding fish habitat ecology to achieve conservation. *Journal of Fish Biology* 67(SB): 1-22.
- Smith L. E. D., Nguyen-Khoa, S. & Lorenzen, K.. (2005) Livelihood functions of inland fisheries: policy implications in developing countries. *Water Policy* 7: 359-383.
- Sutinen, J. G. (1999) What works well and why: evidence from fishery-management experiences in OECD countries. *ICES Journal of Marine Science* 56: 1051–1058.
- Walters, C. (1996) Challenges in adaptive management of riparian and coastal ecosystems. *Conservation Ecology* [online]1(2):1. Available from the Internet. URL: <http://www.consecol.org/vol1/iss2/art1/>.
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- Weiss, R.S. (1994) Learning from Strangers: *The Art and Method of Qualitative Interview Studies*. Simon & Schuster, New York.
- Welcomme, R.L., Cowx, I.G. Coates, D. Béné, C., Funge-Smith, S., Halls, A.S. & Lorenzen, K. (2010) Inland capture fisheries. *Philosophical Transactions of the Royal Society B* 365: 2881-2896.
- Worm, B. et al. (2009) Rebuilding global fisheries. *Science* 325: 578-585.