

FAS 6355c / FAS 4932 Fisheries Management

Course Syllabus, Fall 2014, 4/3 Credits

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

Lab (graduate only): Monday 1:00 - 3:30 PM, 3096 McCarthy B (on-campus);

Tuesday 8:00-10:00 PM, Sakai Meeting (distance students)

Tutorial (undergraduate only): Wednesday 08:30– 09:00 AM, 222 Newins-Ziegler Hall

Course Description

Integrating scientific, social, political and legal factors in fisheries management.

Overview

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 fisheries systems analysis, interview and social survey techniques, resource assessment and modeling, institutional analysis, participatory planning and reflection-in-action; and a repertoire of case studies. The course also aims 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 and homework assignments will provide experience in applying key methods. Throughout the course, all students will develop a case study on a fishery of their choice, applying what they have learned, providing concrete examples for class discussions, and eventually providing an independent review and recommendations for the further management of the fishery. Graduate students will also conduct a practicum: a service-oriented project aimed at addressing a current fisheries management issue through innovative science and/or professional practice. This interdisciplinary course is intended for graduate or undergraduate students majoring in any subject relevant to fisheries management including fisheries/aquatic science, wildlife, resource economics, geography, and political science.

Course Objectives

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- 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) Gain practical experience in analyzing fisheries management issues in a problem- and outcome-oriented, interdisciplinary manner.

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- 5) Reflect on the wider management or conservation context of their research problem (or another issue of their choice)
- 6) Strengthen group work, communication, facilitation and reporting skills.

Teaching and learning approach

The course is designed to foster multi-disciplinary and integrative problem-solving skills in fisheries management. It starts off with structured lectures and labs/homework assignments, but progresses towards more open-ended, student-driven and often group-based learning.

From you as a student, the course requires enthusiasm for grappling with complex and poorly defined real-world fisheries management issues (“messes”). From graduate students, it further requires initiative and a willingness and ability work in groups (you will receive a substantial share of your grade based on group work). Many students enjoy these challenges but some don’t. If you want to be told what to do at all times, are uncomfortable engaging with problems that don’t have a right or wrong answer, or dislike group work then this course may not be for you.

The course is taught in mixed mode for both on-campus and distance students. On-campus and distance students will interact directly through a variety of electronic means and work collaboratively throughout the course.

Instructor

Dr. Kai Lorenzen (Professor), Fisheries and Aquatic Sciences, SFRC, 7922 71st Street, Gainesville, FL 32653. Phone 352-273 3646, Email: klorenzen@ufl.edu, Skype: kailorenzenuf
Web Page: <http://www.aquaticresources.org>.
Office hours: Mondays 10:30-12:00 AM at the NOAA-RTR, McCarthy B (or by arrangement)

Teaching assistant

Chelsey Crandall, Fisheries and Aquatic Sciences, SFRC, 7922 71st Street, Gainesville, FL 32653. Email: kicksea@ufl.edu . Office hours: by arrangement.

Guest lecturers

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)

Mixed mode (on-campus and distance) delivery

The class will be offered in mixed on-campus/distance mode. Distance delivery is mostly asynchronous except for a lab session that will be arranged for mutual convenience (usually on Tuesday night).

All lectures and discussions will be automatically recorded by the UF Mediasite system. Recordings normally become available within 1-2 hours of each session.

All students must upload a personal introduction clip and an introduction clip about their case study fishery via the VoiceThread system. Distance students will also use voice thread to upload brief reflections on their case studies, presentations etc. throughout the course.

Arrangements for distance students for lab and discussion sessions will be discussed and agreed at the beginning of the course.

All participants are encouraged to maintain contact and discuss questions throughout the course using a suitable means agreed upon at the start of class (e.g. Sakai chat room, facebook, etc.).

E-learning and distance learning support

A Sakai site is available. Course material and interactive elements are organized as follows:

Announcements

- All important announcements are posted on the site and copied to your email.

Resources

- Access to resources such as lecture slides and key readings is via a Sakai web interface, organized by week. Lecture slides uploaded for sessions that have not yet been held are preliminary and are normally updated around the time a lecture is given (the course evolves constantly and so do the lectures!).
- Lecture recordings are automatically uploaded to the Mediasite catalog. We also make screen recordings as a backup and these will be made available via Sakai in cases where Mediasite recordings are unavailable.
- Coursework assignments are posted under *Assignments*. Please turn in your coursework through the *Assignments* functionality. (I will accept assignments submitted by email, but only under exceptional circumstances).
- You will receive feedback and grades through the same channel.

Voice Thread

- Use Voice Thread to upload and view clips, presentations etc.

Facebook group/chatroom

- Please use Sakai chat room to post questions and thoughts of general interest to the class.
- Post your questions for the discussion sessions here – by the previous day at the latest!

Assessment & Grading

Graduate

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:

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|--|------------|
| Lab reports (5) | 25% |
| Integrative review paper on case study | 20% |
| Summary presentation on case study | 10% |
| Fisheries management practicum | 30% |
| Participation in class | <u>15%</u> |
| Total | 100% |

Undergraduate

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:

| | |
|------------------------------------|------------|
| Homework exercises (5) | 40% |
| Policy paper on case study | 20% |
| Summary presentation on case study | 10% |
| Quizzes | 15% |
| Participation in class | <u>15%</u> |
| Total | 100% |

Grading information

Grades will be allocated as: A (93 - 100 %), A- (90 - 92 %), B+ (86 - 89 %), B (82 - 85 %), B- (78 - 81 %), C+ (74 - 77 %), C (67 - 73 %), C- (63 - 66 %), D+ (59 - 62 %), D (55 - 58 %), D- (51 - 54 %), E (< 50 %).

Click here for UF grading information for students: <http://www.registrar.ufl.edu/hubstudents.html>

Coursework requirements

Introductory clips

All students are required to upload introductory clips about themselves and their case study to Voice Threat.

Lab reports (graduate) /homework assignments (undergraduate)

Lab sessions (graduate) and homework assignments (undergraduate) are designed to help students exercise key skills in fisheries assessment, interviewing, and bio-economic analysis. The graduate labs and undergraduate assignments will cover similar ground and are due within 2 weeks of the assignment being given.

Five lab/assignment reports are required:

- 1) Qualitative stakeholder interviews (Group reports, 3 students per group).
- 2) Quantitative social surveys (Group reports by section: on-campus graduate, distance graduate, on-campus undergraduate).
- 3) Fisheries assessment I: biomass dynamics modeling (Individual reports).
- 4) Fisheries assessment II: dynamic pool models (Individual reports).
- 5) Bio-economic modeling (Group reports, two students per group).

Depending on the lab/assignment, students will work and submit reports either individually or in groups. Group work enhances learning and helps prepare for the practicum. Reports should concisely address the questions posed in the assignments in writing, supported by pertinent figures and/or tables. It is not necessary to provide introductory material or describe methods, though knowledge and understanding of both should be evident in the presentation and interpretation of results. Individual lab reports will normally be around 3-5 pages in length, group reports may be longer.

Grading criteria: The report answers all questions posed in the assignment in a clear and concise manner. Text is supported by key figures and/or tables, all of which are appropriately labeled, described in a legend and referenced in the text. Interpretation of results shows good understanding of the underlying concepts and methods.

Integrative fisheries case study

All students will develop an integrative case study on a fishery or a fisheries-related problem of their choice. Graduate students are encouraged to choose a cases study related to their research topic. The aim of the case study is to conduct and present and integrative-interdisciplinary analysis of the outcomes of a fishery, the factors that led to these outcomes, options for improving management (or sustaining positive outcomes), and generic lessons that can be learned from the case study.

In the spirit of reflective practice, students will develop initial case study presentations for discussion in class, update and modify their presentations in the light of discussions and feedback, and then upload final presentations for grading. Distance students upload initial presentations via VoiceThread for re-play in class. All students upload final presentations to VoiceThread.

Grading criteria: The presentations provide a clear, integrative and concise assessment of the fishery problem, possible management responses, and any generic lessons that can be learned from this specific case. Statements are appropriately supported by reference to publications, information from stakeholders, or personal observations. The presentation shows ability to synthesize and critically evaluate information. Initial presentations are due 11/16/2014, final presentations 11/30/2014.

Fisheries management practicum

The practicum is a service-oriented project in which students address a current fisheries management issue through innovative science and/or professional practice. The practicum is a student-led activity under faculty guidance and will normally involve some engagement with fisheries stakeholders. The practicum has three key components: (1) proposal (2) project activities and outputs; and (3) reflection on the effectiveness of the project activity.

(1) Proposal

The proposal should be about 3 pages in length and include: (a) background; (b) problem definition; (c) aims and objectives; (d) project activities; (e) timeline; (f) outputs (g) intended contributions of the project to addressing the problem identified.

(2) Practicum activities and outputs

Practicum activities may include, but are not limited to:

- Interview studies or social surveys
- Modeling studies involving interaction with stakeholders
- Writing of policy papers that synthesize information and provide novel perspectives
- Conducting stakeholder workshops
- Development of educational materials

Project outputs may vary in accordance with objectives and activities.

(3) Reflection on the effectiveness of the practicum activities

Students will present a reflection on the effectiveness of their practicum activities in class (uploaded to VoiceThread for distance groups).

The grade for the practicum will comprise elements awarded for background review, problem

definition and identification of the project activity (5% of course grade); the project activity and outputs (20% of course grade) and reflection on the project activity (5% of course grade). All project materials will be peer-reviewed within the class before final submission. Grading criteria: the management problem is clearly identified; the project activity is clearly described, of appropriate scope, and carried out to a high standard; and the efficacy of the approach taken is discussed critically in the post-project reflection. Due: All elements must be completed by the last day of class (12/10/14).

Participation in class

Students are expected to participate actively and constructively in class.

Grading criteria: On-campus students: Students make regular constructive contributions to class by asking pertinent questions, synthesizing knowledge and results, and taking on facilitation and leadership roles in class activities. Attendance in class is required for on-campus graduate and undergraduate students. Distance students: Students make regular constructive contributions in online discussions and lab meetings. Weight: 15 % of final grade.

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

Note: details of the schedule may change in response to external circumstances or pedagogical needs of the course.

| Week | Date | Topic | Recommended reading |
|------|-----------------|---|---|
| 1 | 8/25 Lecture | Introduction to the course. Introductions and discussion of student's interests and research topics. | |
| | 8/25 Lab | Practicum (Session 1) Initial discussion on possible topics, interests, tasks, timeline | |
| | 8/27 Lecture | Discussion I: Importance of fisheries, status and management challenges. | Gutierrez et al. 2011; Hilborn 2007b; Post et al. 2002; Welcomme et al 2010; Worm et al. 2009; |
| 2 | 9/01 Lecture | Labor Day – no lecture | |
| | 9/01 Lab | Labor Day – no lab | |
| | 9/03 Lecture | Understanding fisheries systems | Degnbol & McCay 2006; Garcia & Charles 2007; Lorenzen 2008 |
| 3 | 9/08 Lecture | Qualitative interview studies | Acheson 1982; Weiss 1994; Kuehn et al. 2006; Adkins 2010; Turner 2010; Guion et al. 2011 |
| | 9/08 Lab | Qualitative interviewing | |
| | 9/10 Lecture | Stakeholders as individuals: values, attitudes, assets and drivers of behavior | Salas & Gaertner 2004; Smith et al. 2005; Arlinghaus & Mehner 2006; Hutt & Bettoli 2007 |
| 4 | 9/15 Lecture | Quantitative social surveys (Taylor Stein) | Dillman et al. 2009 |
| | 9/15 Lab | Quantitative surveys Qualitative interviewing | |
| | 9/17 Lecture | Fisheries governance | Sutinen 1999; Hilborn et al. 2005; Ostrom 2007; Branch 2009; Fujita et al. 2010; Gutierrez et al. 2011, NOAA 2007 |
| 5 | 9/22 | Fisheries assessment I | Hilborn & Walters 1992 (Ch. |

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| | Lecture | Biomass dynamics models | 8); Haddon 2001 (Ch. 10); Cooper 2006; Edwards et al. 2012 |
| | 9/22 Lab | Fisheries assessment Quantitative surveys Practicum – firming up project | |
| | 9/24 Lecture | Fisheries Assessment II Dynamic pool models | Hilborn & Walters 1992 (Ch. 10); Haddon 2001 (Ch. 2, 11); Cooper 2006; Edwards et al. 2012 |
| 6 | 09/29 Lecture | Fisheries assessment III Reference points and management procedures Introduction to Gulf Council SSC materials | Charles 2001 (Ch. 11), Walters 2007; Hilborn 2007(a); Prager & Shertzer 2010; Edwards et al. 2012 |
| | 09/29 Lab | Fisheries assessment Practicum – review of proposals & IRB | |
| | 10/01 Lecture | Gulf Council SSC Meeting (class will attend in person or via video link) | Documents will be on the FTP server at www.gulfcouncil.org |
| 7 | 10/06 Lecture | Fisheries assessment III cont'd | |
| | 10/06 Lab | Fisheries assessment Practicum – finalizing proposals | |
| | 10/08 Lecture | Discussion on Gulf council SSC meeting | |
| 8 | 10/13 Lecture | Discussion on Gulf council SSC meeting | |
| | 10/13 Lab | Practicum | |
| | 10/15 Lecture | Natural sciences, social sciences, artistry and the practice of fisheries management | Schön 1983; Sarewitz 2004; Jentoft 2006 |
| 9 | 10/20 Lecture | Communication strategies for working with stakeholders (Martha Monroe) | Kaplan & Kaplan 2009, Monroe et al. 2009 |
| | 10/20 Lab | Fisheries assessment Practicum | |
| | 10/22 Lecture | Economics of fisheries management (Sherry Larkin) | Milon et al. 1999; Conrad 1999 (Ch. 3); Whitmarsh 2011 (Ch. 2) |
| 10 | 10/27 Lecture | Stakeholder engagement and workshop facilitation (Chelsey) | Tierny 2011 |

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| | | Crandall) | |
| | 10/27 Lab | Bio-economic modeling Practicum | |
| | 10/29 Lecture | Reforming fisheries management: change and processes | McCay (1989); Grimes (1996); Harris et al. (2007); Shelley (2012) |
| 11 | 11/03 Lecture | Managing fisheries conflicts (Chelsey Crandall) | Covey 1990; Fisher & Uri 1991, Pomeroy et al. 2007; Pomeroy & Rivera-Guieb 2006 |
| | 11/03 Lab | Bio-economic modeling Practicum | |
| | 11/05 Lecture | Habitat in fisheries management (Juliane Struve) | Langton et al. 1996; Levin & Stunz 2005 |
| 12 | 11/10 Lecture | Spatial fisheries management and marine spatial planning | Fogarty & Botsford 2007; Lorenzen et al. 2010 |
| | 11/10 Lab | Practicum | |
| | 11/12 Lecture | Ecosystem-based fisheries management | Francis et al. 2006; Hobday et al. 2011; Rice 2011 |
| 13 | 11/17 Lecture | Case study presentations and discussions (I) | |
| | 11/17 Lab | Practicum | |
| | 11/19 Lecture | Case study presentations and discussions (II) | |
| 14 | 11/24 Lecture | Law in Fisheries Management – Discussion (Shepherd Grimes, NOAA lawyer) | |
| | 11/24 Lab | Practicum – draft outputs due | |
| | 11/26 Lecture | Day before Thanksgiving – no class | |
| 15 | 12/01 Lecture | Managing recreational fisheries: do different principles apply? | Radomski 2001; Post et al. 2002; Arlinghaus et al. 2007; Johnston et al. 2014; TRCP 2014 |
| | 12/01 Lab | Practicum – review of draft outputs | |
| | 12/03 Lecture | Where there is no data and no government: managing small-scale fisheries in developing countries | Allison & Ellis 2001; Prince 2010; Cochrane et al. 2011. |
| 16 | 12/08 Lecture | TBD | |
| | 12/08 Lab | Practicum – review of final outputs | |

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| | | and reflection | |
| | 12/10 | Discussion IV/ Class synthesis | |

Textbooks

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. (Or more recent editions.)

Key readings

Acheson, J.M. (1975) Fisheries management and social context: the case of the Maine lobster fishery. *Transactions of the American Fisheries Society* 104: 653-668.

Adkins, T.J. (2010) Fishing for masculinity: recreational fishermen's performances of gender. M.A. Thesis, Kent State University. 64pp.

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.

Branch, T. (2009) How do individual transferable quotas affect marine ecosystems? *Fish and Fisheries* 10: 39-57.

Charles, A. T. (2001) *Sustainable Fishery Systems*. Oxford: Blackwell Science.

Cochrane, K.L., Andrew, N.L. & Parma, A.M. (2011) Primary fisheries management: a minimum requirement for provision of sustainable human benefits in small-scale fisheries. *Fish & Fisheries* 12: 275-288.

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.

Covey, S.R. 1990. Principles of Empathic Communication. In *The seven habits of highly effective people*. New York: Simon and Schuster.

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.

Degnbol, P., & McCay, B. J. 2006. Unintended and perverse consequences of ignoring linkages in fisheries systems. *ICES Journal of Marine Science*, 64: 793-797.

- Edwards C. T. T., Hillary R. M., Levontin P., Blanchard J. & Lorenzen K. (2012) Fisheries assessment and management: a synthesis of common approaches with special reference to deepwater and data-poor stocks. *Reviews in Fisheries Science* 20: 126-153.
- Essington, T. E., A. H. Beaudreau, & 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>
- Fisher, R. and W. Ury. 1991. *Getting to yes: negotiating agreement without giving in*. Chapters 1 and 3.
- 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.
- Fujita, R.M., Honey, K.T., Morris, A., Wilson, J.R. & Russell, H. (2010) Cooperative strategies in fisheries management: integration across scales. *Bulletin of Marine Science* 86: 251-271.
- Garcia, S.M. & Charles, A.T. (2008) Fishery systems and linkages: implications for science and governance. *Ocean and Coastal Management* 51: 505-527.
- Garcia, S. & Rosenberg, A. (2010) Food security and marine capture fisheries: characteristics, trends, drivers and future perspectives. *Philosophical Transactions of the Royal Society B* 365: 2881-2896.
- Grimble, R. & Wellard, K. (1997) Stakeholder methodologies in natural resource management: a review of principles, contexts, experiences and opportunities *Agricultural Systems* 55: 173-193
- Grimes, S.R. (1996) The 1994 net ban constitutional amendment: A case study of fisheries management in Florida. M.S. Thesis, Texas A&M University.
- Gutierrez, N.L., Hilborn, R. & Defeo, O. (2011) Leadership, social capital and incentives promote successful fisheries. *Nature* 470: 386-389.
- Haddon, M. 2001. *Modelling and Quantitative Methods in Fisheries*. Chapman and Hall, London.
- Harris, J.M. et al. (2008) Redressing access inequities and implementing formal management systems for marine and estuarine subsistence fisheries in South Africa. In: *Fisheries Management: Progress Towards Sustainability* (Ed. T.R. McClanahan & J.C. Castilla). Wiley.
- 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.
- Hobday et al. (2011) Ecological risk assessment for the effects of fishing. *Fisheries Research* 108: 372-384.

- Hutt, C.P. & Bettoli, P.W (2007) Preferences, Specialization, and Management Attitudes of Trout Anglers Fishing in Tennessee Tailwaters. *North American Journal of Fisheries Management* 27: 1257-1267.
- Irwin, E.R., and M.C. Freeman. 2002. Proposal for adaptive management to conserve biotic integrity in a regulated segment of the Tallapoosa River, Alabama, U.S.A. *Conservation Biology* 16:1,212–1,222.
- Irwin, E.R. & Mickett Kennedy, K.D. (2008) Engaging Stakeholders for Adaptive Management Using Structured Decision Analysis. The Third Interagency Conference on Research in the Watersheds, 8-11 September 2008, Estes Park, CO
- Jentoft, S. (2006) Beyond fisheries management: The *Phronetic* dimension. *Marine Policy* 30: 671-680.
- Johnston, F.D., Arlinghaus, R. & Diekmann, U. (in press) Fish life history, angler behaviour and optimal management of recreational fisheries. *Fish and Fisheries*.
- 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.
- Kuehn, D.M., Dawson, C.P. & Hoffman, R. (2006): Exploring fishing socialization among male and female anglers in New York's Eastern Lake Ontario area. *Human Dimensions of Wildlife: An International Journal* 11: 115-127
- 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.
- Levin, P. S. & Stunz, G.W. (2005) Habitat triage for exploited fishes: Can we identify “essential fish habitat?” *Estuarine, Coastal and Shelf Science* 64, 70-84.
- 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.
- McCay, B.J. (1989) Co-management of a clam revitalization project: the New Jersey "spawner sanctuary" project. In: *Co-operative Management of Local Fisheries* (Ed. E. Pinkerton). UBC Press.
- Milon, W.J., Larkin, S.L. & Erhardt, N.M. (1999) Bioeconomic models of the Florida commercial spiny lobster fishery. Sea Grant Report Number 117, Florida Sea Grant College Program, Gainesville, Florida.
- 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.
- NOAA (2007) Magnuson-Stevens Fishery Conservation and Management Act. Public Law 94-265.
- 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.
- Pomeroy, R.S. & Rivera-Guieb, R. (2006) *Fishery Co-Management: A Practical Handbook*. Wallingford, CABI Publishing.
- Pomeroy, R. et al. 2007. Fish wars: conflict and collaboration in fisheries management in Southeast Asia. *Marine Policy* **31**: 645-656.
- Post, J.R. et al. (2002): Canada's recreational fisheries: the invisible collapse? *Fisheries* **27**: 6-17
- Prager, M.H. & Shertzer, K.W. (2010) Deriving acceptable biological catch from the overfishing limit: implications for assessment models. *North American Journal of Fisheries Management* **30**: 289-294.
- Prince, J. (2010) Rescaling fisheries assessment and management: a generic approach, access rights, change agents, and toolboxes. *Bulletin of Marine Science* **86**: 197-220.
- Radomski, P. J., Grant, G. C., Jacobson, P. C. & Cook, M. F. (2001). Visions for recreational fishing regulations. *Fisheries* **26**: 7-18.
- Rice, J.C. (2005) Understanding fish habitat ecology to achieve conservation. *Journal of Fish Biology* **67**(SB): 1-22.
- Rice, J. (2011) Managing fisheries well: delivering the promises of an ecosystem approach. *Fish and Fisheries* **12**, 209-231.
- Salas, S. & Gaertner, D. (2004) The behavioural dynamics of fishers: management implications. *Fish and Fisheries* **5**: 153-167
- Sarewitz, D. (2004) How science makes environmental controversies worse. *Environmental Science & Policy* **7**: 385-403.
- Schön, D.A. (1983) *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books. 374 pp.
- Shelley, P. (2012) Have the managers finally gotten it right? Federal groundfish management in New England. *HeinOnline - 17 Roger Williams U. L. Rev.* **21**.
- 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.
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