Ecosystem-Based Fisheries Science & Management

AFS/OCG 560
3 credits
Spring 2019

Instructors

Dr. Austin Humphries, Kingston Campus, Center for Biotechnology and Life Sciences (CBLS), Room 187, 401.874.9839, humphries@uri.edu, office hours by appointment

Dr. Jeremy Collie, Narragansett Bay Campus, Coastal Institute Building, Room 237A, 401.874.6859, jcollie@uri.edu, office hours by appointment

Meeting Time and Location

Tuesday and Thursday, 9:30 - 10:45am, Washburn Hall, Room 308, Kingston Campus

Catalog Description

The scientific components of ecosystem-based fisheries management: climate variation, trophic interactions, habitat, bycatch, and human dimensions. Classes emphasize problem-solving through case studies of domestic and international fisheries. Prerequisites: Graduate standing, Fisheries Science (AFS 415), or permission of instructors.

Course Details

Ecosystem-based fisheries science and management considers the relationships among all ecosystem components, including humans and other species, and the environments in which they live. While several countries, including the U.S., have adopted the principle of ecosystem-based fisheries management, fishery organizations now face the challenge of implementing an ecosystem approach. To work and succeed in this developing field, students require a broad education in fisheries, oceanography, ecology, social sciences, and economics, as well as an ability to synthesize data into a common modeling and assessment framework.

The objective of this course is to consider fisheries in an ecosystem context, thinking about the relative importance of biogeophysical forcings, species interactions, habitats, socioeconomic drivers, and cultural histories. The course objective is met through a combination of lectures, readings, discussions, homework, and individual or group problem-solving using computer modeling software. Case studies will be drawn from local, regional, and international examples, which change each time the course is offered depending on student interests. As a (graduate) student, you will take an active role in this course which means you will be expected to come to class ready to engage in discussion and inquiry.

Learning Outcomes

By the end of the course, you will be able to:
(1) Describe the main components of an ecosystem-based fisheries management system;
(2) Develop skills for critically evaluating scientific literature and discussing it among peers;
(3) Use computer modeling software and risk assessment to explore interactions between organisms.

EXPECTATIONS & REQUIREMENTS

This course is composed of three main elements: homework readings/assignments, two exams, and in-class discussion. Grading will be based on a mid-term and final exam (45%), homework readings/assignments (30%), participation in in-class discussions (25%).

Homework readings/assignments: Readings will be on peer-reviewed articles and assignments will focus on quantitative exercises using risk assessment and ecosystem modeling software such as Ecopath. You can work

with classmates on these assignments. We will also assign readings throughout the course associated with student led discussion (see below).

Exams: A mid-term exam is scheduled for Thursday, March 7. The final exam date and time is Tuesday, May 7 at 8-11am. These will be a combination of short- and long-answer questions, as well as some basic calculations. Please bring a simple calculator.

Student led discussion: We will identify a set of key papers that pertain to ecosystem-based fisheries science and management. You and your partners will be responsible for leading a 45-minute discussion and exercise. Expect to meet with one of us prior to your discussion to talk about the papers and how you might engage the class. You will be graded not only on papers you present, but also on your participation in discussions led by other students.

Textbook: No textbook is required for this course; however, some useful references books are:

Link, J. (2010). *Ecosystem-based fisheries management: confronting tradeoffs*. Cambridge University Press.

The following books are available at the Carruthers Library (Kingston Campus) and the Pell Library (Bay Campus):

Fogarty, M.J. and J.J. McCarthy (2014) *Marine ecosystem-based management. The Sea, Volume 16*. Harvard University Press. (QH541.5 S3 M273 2014)

McLeod, K. and H. Leslie (2009) *Ecosystem-Based Management for the Oceans*. Island Press. (QH541.5 S3 M374 2009)

Sakai: The Sakai site for this course will contain the syllabus, all lecture presentations given in class, homework, readings, and any other course materials. Any announcements for the course will also be posted on the site, so please be sure that you check your associated email. It is your responsibility to check Sakai before emailing instructors about assignments.

Late assignments and grading: Late homework will be accepted and read but for each calendar day they are late, your grade will be reduced by 10%.

Email: Please feel free to email us with any questions, thoughts, comments, or concerns. Messages will be responded to within 48 hours of being received (not including weekend hours). When relevant, questions about similar topics/concerns may be answered in one group message (e.g., via Sakai). You can email us directly or use the Sakai messaging portal.

Attendance: Attendance is mandatory. You are allowed only 3 absences during the semester. Please arrive to class on time. If you arrive to class more than 10 minutes late, you will be marked absent for that meeting. Missing class will negatively affect your grade.

Technology: We request that you turn off / silent mode your cell phones and place them out of view – this means in your bag and off your desk. Proper laptop usage includes closing all non-course related pages and tabs, viewing only the course readings/lecture slides, and using the laptop as a tool to guide learning as opposed to distraction.

Week	Date	Topic	Lead Instructor
1	Jan 22	Advising day – no classes yet	
	Jan 24	Overview of class; Introduction to EBFM	JC (no AH)
2	Jan 29	Network diagrams; Introduction to food webs	JC (no AH)
	Jan 31	Single-species vs. multi-species management exercise	JC (no AH)
3	Feb 5	Essential Fish Habitat (EFH)	AH
	Feb 7	Student led discussion of literature	AH
4	Feb 12	Introduction to mass-balance, surplus-production models	JC
	Feb 14	Trophic ecosystem modeling; Design exercise	JC
5	Feb 19	Ecopath modeling	AH (no JC)
	Feb 21	Ecopath modeling exercise (assignment)	AH (no JC)
6	Feb 26	Bycatch and mixed-stock fishing	JC
	Feb 28	Multi-species modeling exercise	JC
7	Mar 5	Fishing fleet behavior	AH
	Mar 7	**Mid-term Exam**	-
-	Mar 12	No class – Spring Break	-
	Mar 14	No class – Spring Break	-
8	Mar 19	Climate change and fish distributions	JC
	Mar 21	Student led discussion of literature	JC
9	Mar 26	Loop analysis of qualitative models	JC (no AH)
	Mar 28	Loop analysis of network model from 29 January	JC (no AH)
10	Apr 2	Human dimensions (social wellbeing)	AH
	Apr 4	Student led discussion of literature	AH
11	Apr 9	Ecopath modeling exercise (assignment)	AH (no JC)
	Apr 11	Student led discussion of literature	AH (no JC)
12	Apr 16	Fisheries economics catch shares exercise	HU (no JC)
	Apr 18	Fisheries economics and catch shares	HU (no JC)
13	Apr 23	Qualitative risk assessment	JC
	Apr 25	Risk assessment exercise (assignment)	JC
14	Apr 30	Course wrap up lecture and discussion	AH + JC
	May 7	**Final Exam from 8-11am**	AH + JC

*** schedule subject to change**

Total student led discussion sessions: 4
Total in-class exercises: 7

AH = Austin Humphries
JC = Jeremy Collie
HU = Hiro Uchida