UNIVERSITY OF SOUTHERN CALIFORNIA
Environmental Studies Program

ENST 310: Sustainable Fisheries Management

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Office hours: TBA   WPH 203

Course Overview: This course integrates scientific, social, political, and economic factors of fisheries management, engaging students in key issues of coastal and marine sustainability. Fisheries are an important source of food and livelihood for societies across the planet. Yet many fisheries are in decline or collapse due to overfishing and/or habitat degradation. This course will present the historical and modern significance of fishing to society, the causes and implications of fisheries decline, and current and proposed strategies for achieving more sustainable fisheries. Students will be exposed to the fundamental ecological, social, political, and economic dimensions of fisheries management from local to international scales, with case studies focusing on Southern California fisheries and marine protected areas. This course is designed for hands-on learning and includes quantitative components that allow students to evaluate ecological data and perform analyses related to stock assessment, game theory, and stakeholder analysis. Such learning objectives are aligned with those of the ENST Program, as a whole (for details, see: https://dornsife.usc.edu/ environmental-studies/learning-objectives/). Ultimately, students will learn about some of our most important global resources, and why achieving sustainable fisheries will be essential to the future well being of humans and the environment.

Course Texts
1. *Marine Fisheries Ecology* (abbreviated MFE below) by Simon Jennings, Michel J. Kaiser and John D. Reynolds
2. *An Unnatural History of the Sea* by Callum Roberts (abbreviated UHS below; *Note: available online by USC Library*)

Course Requirements: Routine attendance and active participation are an important part of each class session. For the best learning experience, you are expected to have read the course materials (see below) by the date it is discussed in class. Roll will be taken periodically in the form of thought exercises, reading assignments, and in-class questions. You are responsible for information, announcements, date changes, and any other course material presented, regardless of your participation in the classroom.

Course Grading: You will be graded on the basis of your performance on exams, data assignments, reading guides, presentations, and class participation. Course materials will be posted on Blackboard for download, subsequent study, and analysis. Note: Data Assignments and Reading Guides will be submitted via Blackboard (see Bb for specific deadlines and grading rubrics). Exam questions will be drawn from course readings and material discussed in lecture, and will include both multiple choice and essay questions. The Final Exam is partially cumulative and will include ~20% of material covered in the first two-thirds of the course; the remaining ~80% of the Final Exam will include only material covered after Exam 2 (i.e., the last third of the course). ***No make-up midterms or final exams will be allowed without explicit permission.*** If for any reason a student misses an exam or other course requirement, they will be given a zero for that assignment.

Below is a list of the graded assignments and their point value:

Midterm 1	100 pts	16%
Midterm 2	100 pts	16%
Final Exam	125 pts	21%
Group Data Project & Presentation	100 pts	16%
Data Assignments (7 total)	126 pts	21%
Reading Guides & Discussions (6 total)	60 pts	10%
TOTAL POINTS	**611 pts**	**100%**

Assignments & Group Project: Students will learn to use R-Studio, an open source, statistical programming and graphics program, and become proficient in the use of Microsoft Excel, a spreadsheet application used for data management. Using these software packages, students will analyze a series of datasets (7 total; provided by the instructor) and look for trends that support their hypotheses. Each data assignment (n=6) will require an

individual student to organize and quantitatively evaluate a relatively simple dataset (e.g., single parameter such as fish size), as well as provide a 2-3 page written report (single-spaced) on the results. The final data assignment is a group project (2 students per group) and will require students to analyze a more complicated set of data (e.g., multiple parameters such as fish size and biomass). Final projects will include a written (4-5 pages, single-spaced) and oral presentation where students will showcase their research question and findings based on their analysis of the relevant data. Each data assignment (including the final project) will be evaluated for originality, accuracy and thoroughness of research, attention to detail, and quality of finished project.

Academic Conduct: USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus contains the University Student Conduct Code (see University Governance, Section 11.00), while the recommended sanctions are located in Appendix A.

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards (https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct (http://policy.usc.edu/scientific-misconduct/).

Discrimination, sexual assault, and harassment are not tolerated by USC. You are encouraged to report any incidents to either the Office of Equity and Diversity http://equity.usc.edu or the Department of Public Safety http://adminopsnet.usc.edu/department/department-public-safety. This is important for the safety of the whole USC community. Another member of the university community, such as a friend, classmate, advisor, or faculty member, can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men (http://www.usc.edu/student-affairs/cwm/) provides 24/7 confidential support, and the sexual assault resource center (http://sarc.usc.edu) describes reporting options and other resources.

Support Systems: A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute (http://dornsife.usc.edu/ali), which sponsors courses and workshops specifically for international graduate students.

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester (http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html). A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 am to 5:00 pm, Monday through Friday. DSP contact information: Ph: (213) 740-0776, TDD: (213) 740-6948, Fax: (213) 740-8216, email: ability@usc.edu.

In the case of a declared emergency and/or if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies. For details, see: http://emergency.usc.edu/

Statement on Religious Observation Accommodations: USC policy grants students excused absences from class for observance of religious activities. Students may be given an opportunity to make up work missed because of religious observance. I am very responsive to requests for an excused absence when made in advance. Please note that this applies only to religious activities that necessitate a student's absence from class and/or a conflict with a specific aspect of the course.

Course Schedule: For the best learning experience, you are expected to have read the assigned material by the date it is discussed in class. Chapter and article readings will be posted online. The readings and schedule of topics may be adjusted throughout the semester depending on the progress of the class.

Week	Date	Topic	Readings
1	Jan 10, 12	Fisheries Ecology: Methods & Management; **Data Assignments (Excel & R-Studio) & Group Project Review**	MFE: Ch. 1; UHS: Ch. 1-3
2	Jan 17, 19	Overfishing & Shifting Baselines; **Reading Guide 1; Data Assignment 1**	MFE: Ch. 5-6; UHS: Ch. 11, 12, **Pauly & Watson 2003**
3	Jan 24, 26	Tragedy of the Commons, Cod Case Study; **Data Assignment 2**	MFE: Ch. 11; UHS: 15, 18, **Frank et al. 2005**
4	Jan 31, Feb 2	Primary Production & Fisheries; **Reading Guide 2; R-Studio Review**	MFE: Ch. 2, 3, **Jackson et al. 2001**
5	Feb 2	Case Studies Local Fisheries; **Data Assignment 3**	MFE: Ch. 9, 10, **Chavez et al. 2003**
6	Feb 7, 9	**MIDTERM 1**; Population Dynamics & Stock Assessments	MFE: Ch. 4, 7, **Pauly 1998**
7	Feb 14, 16	Fisheries Management: Impacts; **Data Assignment 4**	MFE: Ch. 14, 15; UHS: Ch. 17, **Fogarty & Murawski 1998**
8	Feb 21, 23	Marine Governance & Policy; **Reading Guide 3**	MFE: Ch. 17; UHS: CH. 22-24, **Alexander 1993**
9	Feb 28, Mar 2	California Fisheries Management; **Data Assignment 5**	**Claisse et al. 2014**
	Mar 7, 9		
10	*Mar 13-17*	*SPRING BREAK NO CLASS*	
11	Mar 21, 23	Aquaculture & Sustainable Fisheries; **Reading Guide 4**	MFE: Ch. 16, **Bush et al. 2014**
12	Mar 28, 30	**MIDTERM 2**; Fisheries Management (Solutions); **Data Assignment 6**	**Roberts & Polunin 1993**
13	Apr 4, 6	Marine Reserves and Ecosystem-Based Management I; **Reading Guide 5**	**Ruckelshaus et al. 2008**
14	Apr 11, 13	Marine Reserves and Ecosystem-Based Management II; **Data Assignment 7**	**Pikitch et al. 2003**
15	Apr 18, 20	Resilience & Sust. Seafood for Future; **Reading Guide 6**	UHS: Ch. 25, 26 **Micheli et al. 2014 Hughes et al. 2005**
16	Apr 25, 27	Final Data Review; **Data Assignment 8** (Group Project)	
	May 9	**FINAL EXAM, Tuesday 8:00-10:00 AM, WPH 203**	