

Ecosystems and Fisheries - SIO 137

Fall 2023

Instructor: Dr. Colleen Petrik

Email: cpetrik@ucsd.edu

Time: Tue, Thu 10:30 AM – 11:50 AM

Place: MCTF 210, SIO campus

Discussion Sections: Tue 12:00-12:50 PM and Thu 3:00-3:50 PM, MCTF 210.

Instructor Office Hours: Available upon request, generally Thursday afternoons on Zoom.

Teaching Assistant (TA): Annie Effinger, aeffinge@ucsd.edu

TA Student Office Hours: TBD.

Course Description: Marine ecosystems are undergoing unprecedented changes due to exploitation and environmental shifts. Fisheries oceanography is the “study of oceanic processes affecting the abundance and availability of commercial fishes” (Wooster 1961). Fish stocks were historically managed as a single species in relation to “highly variable natural conditions” (Hjort 1914). There is a growing push to manage resources within the context of the ecosystem. Complex interactions between species must be considered against the backdrop of a dynamic, shifting physical environment. This course introduces the broad ecological processes and approaches fundamental to studying the dynamics of populations, food webs, and ecosystems. The basics of fisheries oceanography will be covered, along with the ecosystem models utilized to understand long-term ecosystem changes. While a diversity of species and ecosystems will be covered, the focus will be on offshore and deep-water habitats, which fill Earth's dominant living space.

Pre-requisites: SIO 134 (Biological Oceanography) and upper-division standing (or instructor consent).

Course Structure: Lectures, by Dr. Petrik and guests, will present the fundamentals of each topic. Lectures include interactive and reflective content and activities, as possible. I have carefully curated guest lecturers with diverse backgrounds and experiences, to enhance your learning and exposure to the discipline. There will be 3 in-class quizzes, spread evenly throughout the course. In lieu of a “traditional” course format focusing on arduous exams, I will facilitate learning through regular activities, presentations, and critical thinking exercises. Grading templates describing evaluation criteria are distributed on Canvas. Students who do not attend classes in Week 1 are subject to being dropped from the course.

Lectures: Lectures will be offered synchronously and all students are expected to participate synchronously during the set course time outlined in the official UCSD Schedule of Classes. This will help to facilitate collective and interactive learning. Guidance for remote instruction can change throughout the term and all changes will be announced on Canvas, with as much time in advance as is possible. Under current UCSD guidelines, up to half of a course's instruction can be delivered remotely.

Quizzes: Short tests (20-30 mins) will consist of short answers and multiple-choice questions, focusing primarily on scientific concepts, ecological theory, lecture material, and assigned readings. Quizzes will only be available synchronously during the official course meeting time(s).

Group Presentations (GPs): Scientific knowledge is anchored in the peer-reviewed literature. Students will gain experience in reading and interpreting the literature and effectively

orally communicating it with 2-4 assigned readings per week. Students will work in assigned groups to present a brief synopsis of the readings (peer-reviewed journal articles). Presentations will occur during the first 15 mins of the class. Groups will communicate a clear synopsis of the questions, approach, findings, and implications. Students present twice per quarter to allow for feedback and improvement. The TA will lead mandatory discussion sections to help students prepare their presentations. The use of AI presentation generation is discouraged.

Lecture Reflection Abstracts (LRAs): Clarity in learning and thought are critically expressed in clear, concise writing. For 10 out of the 18 lectures, students will write brief (150 words max) abstracts reflecting on core scientific concepts, messages, and delivery. These abstracts must be grammatically correct (proofread them!) and absent of spelling or punctuation errors. Abstracts must be content-based and may not comment on the physical appearance or personal qualities of the lecturer but focus instead on what you have learned and how it might impact your life or thinking. These will be shared with the guest lecturers as a thank you for their time. The use of AI text generation (e.g. ChatGPT) is discouraged.

Science Communication Assignment: Increasingly, the ability to clearly communicate science is necessary in our changing world. Students will be challenged to develop creative and effective ways to communicate fisheries and ecosystem science to diverse audiences. This assignment requires you to creatively convey one or more key fisheries/ecosystem concepts (and corresponding message/issue) derived from a class lecture. For example, this can take the form of a poem, a song, an art piece or info-graphic, a short story, a short audio or video podcast/blog/TikTok, or a Twitter/Instagram thread. Your piece must be scientifically accurate. To effectively carry out this assignment, you should work to clearly ascertain main take-home messages from lectures, which can be pursued with your classmates or with the TA/instructor. This assignment is due by **December 7th**, the last day of instruction.

Assigned Readings and Resources: Readings and resources will be regularly provided to supplement lecture material. These will be posted on Canvas under the appropriate lecture module (organized sequentially by lecture number). Readings reinforce and complement the material covered in lectures and may provide you with additional perspective(s) for understanding material. There is no assigned textbook for the course, but the following two textbooks will be useful in framing and supplementing lecture material: Marine Fisheries Ecology by Simon Jennings, Michel J. Kaiser, John D. Reynolds (2001, John Wiley and Sons); Fishery Ecosystem Dynamics by Michael J. Fogarty and Jeremy S. Collie (2020, Oxford University Press). Both texts are freely available electronically through the UC San Diego library website.

Grading: Evaluation is by letter grade only and is based on the following proportional breakdown:

Quizzes	150 points (50 points each, 3 total)
Lecture Reflection Abstracts	100 points (10 points, 10 total)
Weekly Presentations of Assigned Papers	100 points (50 points each, 2 total)
Science Communication Assignment	50 points
TOTAL	400 points

Grading Scale: I will use the following grading scale this quarter:

A+ (100-98%)	A (<98-92%)	A- (<92-90%)
B+ (<90-88%)	B (<88-82%)	B- (<82-80%)
C+ (<80-78%)	C (<78-72%)	C- (<72-65%)
D (< 65-60 %)	F (< 60 %)	

Class schedule (Subject to change. Check Canvas for updates)

Lect	Date	Lecture Topic	Activity or Due Date	Lecturer
0	9/28 Th	<i>No class</i> ; Video lecture on Course Overview		
1	10/3 Tu	Ichthyology 101; Fish Diversity		Frable
2	10/5 Th	Intro to Ecosystems Oceanography & Fisheries; Global Issues	LRA 1 - Frable	Petrik
3	10/10 Tu	Fundamentals of Ocean Ecology & Ecosystem Dynamics; Fishing Gears & Techniques	GP 1	Petrik
4	10/12 Th	Adults, Spawning, and Connectivity of Populations	GP 2	Petrik
5	10/17 Tu	Early Life History, Recruitment Variability	GP 3	Thompson
6	10/19 Th	Highly-Migratory Species; High-Seas Fisheries	<i>QUIZ 1</i>	Petrik
7	10/24 Tu	Spatial Patterns in Pelagic Communities	GP 4; LRA 2 - Thompson	Petrik
8	10/26 Th	Temporal Patterns in Pelagic Communities; CalCOFI	GP 5	Bowlin
9	10/31 Tu	Food Webs — Bottom-Up vs. Top-Down Controls & Trophic Cascades	GP 6; LRA 3 - Bowlin	Portner
10	11/2 Th	Fish Production - Bioenergetics, Trophodynamics, Estimation Approaches	LRA 4 - Portner	Petrik
11	11/7 Tu	Computer Models, Part 1: Incorporating the Environment	<i>QUIZ 2</i>	Barton
12	11/9 Th	Computer Models, Part 2: Incorporating the Ecosystem	LRA 5 - Barton	Petrik
13	11/14 Tu	Deep-Sea and Benthic Fisheries; Whaling	GP 7; LRA 6 - Petrik	Petrik
14	11/16 Th	Ecosystem Monitoring Programs	GP 8	Petrik
15	11/21 Tu	Fisheries Regulation & Management Strategies	LRA 7 - Petrik	Kuriyama
	11/23 Th	<i>No class</i>	<i>Thanksgiving</i>	
16	11/28 Tu	Small-Scale Fisheries	GP 9; LRA 8 - Kuriyama	Ferrer
17	11/30 Th	Fishery Impacts: Protected Species and By-catch	GP 10; LRA 9 - Ferrer	Hetherington
18	12/5 Tu	Global Issues - Aquaculture, Climate Change, Consumer Perspectives	LRA 10 - Hetherington; <i>QUIZ 3</i>	Petrik
19	12/7 Th	Last Day of Instruction - Fall 2023	<i>Science Communication Assignment</i>	Petrik

Academic Integrity: Academic Integrity is expected of everyone at UC San Diego. You must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating, or any other forms of dishonesty will not be tolerated as they undermine learning and the University's ability to certify students' knowledge and abilities. Any attempt to get, or help another get, a grade by cheating, lying or being dishonest will be reported to the Academic Integrity Office and will result in sanctions. Sanctions can include an F in this class and suspension or dismissal from the University. Sanctions can leave a permanent mark on your record. Think carefully before you act – ask yourself: Is what I'm about to do or submit an honest, fair, respectful, responsible, trustworthy representation of my knowledge and abilities at this time? Would my instructor unequivocally approve of my action? Please read UCSD's [Policy on Integrity of Scholarship](#) and take the [integrity pledge](#)!

Accommodations for Students with Disabilities: Students requesting accommodations due to a disability need to provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD). Students are required to present their AFA letters to Faculty (make arrangements to contact an instructor privately) and to the OSD Liaison in the Department in advance so that accommodations may be arranged. Contact the OSD for further information: (858) 534-4382, osd@ucsd.edu.

Inclusive Classroom Ecosystem: I strive to create an inclusive learning environment, supportive of students from different backgrounds and identities, experiences, and learning styles. I will endeavor to teach in a manner that is respectful of many forms of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. If you have a preferred name and/or pronouns that differ from your UCSD record, please let us know. Respectful and inclusive behavior is expected from all students at all times. We will be regularly conducting classroom discussions and group work, as well as engaging with guest speakers. I expect us all to work together to foster an environment in which we can all learn, openly and safely ask questions, and contribute opinions and perspectives while being respected and valued. Honesty, listening for understanding, a willingness to share your ideas, and respect for self and others are some basic guidelines that will sustain a positive learning environment.

Late Policy and Make-Up Policy: Please note that there will be no make-up quizzes. If you miss a quiz, you will be assigned zero points for that assessment. If you miss a quiz because of a serious illness or emergency, you must submit official documentation of said illness, emergency, or unavoidable absence, within 5 days of the assessment date, in order to make up the quiz. Make-up assessments may be given orally by the instructor or TA. Assignments that are late will incur a -10% per day penalty, unless formally excused by an official doctor's note, and with advanced notice having been given.

Attendance Policy: Attendance to and active participation in all course lectures is mandatory and required for you to do well in this course. If you are unable to attend for an acceptable reason, please notify Dr. Petrik and the TA directly and in advance.

What You Can Expect of Your Instructors and TA: First and foremost, we are here to support your learning and overall success in this course. Please courteously remember that your instructor and TA have multiple responsibilities here at SIO. For questions received during weekdays (Monday-Friday, excluding University Holidays) you can expect a 24-48 hour response time on Canvas.

Technology Requirements: Canvas is the course communication hub and where you can expect weekly updates on meetings, readings, and assignments. Please use Canvas for

communication with the instructors and TA – email is likely to be lost or buried. Technology may be used for notetaking or group work, as appropriate. I respect you as thoughtful adults and trust in your ability to monitor your own laptop/tablet usage. Please do not abuse this trust by checking emails, scrolling through social media, or partaking in alternative forms of distraction during class. I ask that you keep your phones in your bags and out of sight for the duration of the course meeting period. The sight of phones is known to fragment focus and reduce learning in all settings, and this practice will provide the best learning environment for yourself and your classmates.

The Ongoing COVID-19 Global Pandemic: Students must be in full compliance with UC San Diego's Student Conduct and COVID-19 policies/procedures. Communicate any restrictive struggles that may be uniquely impacting your course performance so we can aim to identify reasonable solutions that are within the University's COVID-19 guidelines, <https://vcsa.ucsd.edu/news/covid-19>

Campus Policies

- [UC San Diego Principles of Community](#)
- [UC San Diego Policy on Integrity of Scholarship](#)
- [Religious Accommodation](#)
- [Nondiscrimination and Harassment](#)
- [UC San Diego Student Conduct Code](#)

Learning and Academic Support

- [Ask a Librarian: Library Support:](#) Chat or make an appointment with a librarian to focus on your research needs
- [Course Reserves, Connecting from Off-Campus and Research Support:](#) Find supplemental course materials
- [First Gen Student Success Coaching Program:](#) Peer mentor program that provides students with information, resources, and support in meeting their goals
- [Office of Academic Support & Instructional Services \(OASIS\):](#) Intellectual and personal development support
- [Writing Hub Services in the Teaching + Learning Commons:](#) One-on-one online writing tutoring and workshops on key writing topics
- [Supplemental Instruction:](#) Peer-assisted study sessions through the Academic Achievement Hub to improve success in historically challenging courses
- [Tutoring – Content:](#) Drop-in and online tutoring through the Academic Achievement Hub
- [Tutoring – Learning Strategies:](#) Address learning challenges with a metacognitive approach

Support for Well-being and Inclusion

- [Basic Needs at UCSD:](#) Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live is encouraged to contact: foodpantry@ucsd.edu | basicneeds@ucsd.edu | (858) 246-2632
- [Counseling and Psychological Services:](#) Confidential counseling and consultations for psychiatric service and mental health programming
- [Triton Concern Line:](#) Report students of concern: (858) 246-1111
- [Office for Students with Disabilities \(OSD\):](#) Supports students with disabilities and accessibility across campus

- Community and Resource Centers Office of Equity, Diversity, and Inclusion: As part of the Office of Equity, Diversity, and Inclusion the campus community centers provide programs and resources for students and contribute toward the evolution of a socially just campus (858).822-.3542 | diversity@ucsd.edu
- Get Involved: Student organizations, clubs, service opportunities, and many other ways to connect with others on campus
- Undocumented Student Services: Programs and services are designed to help students overcome obstacles that arise from their immigration status and support them through personal and academic excellence