

SYLLABUS – BIOE/ENVS 125: Ecosystems of California (Summer 2018)

This course will survey the diversity, structure and functioning of California's ecosystems through time and the ways they have influenced and responded to human activities and stewardship. Topics will include ecosystem drivers such as climate, soils, and land use history; human and ecological prehistory of the state; comparative marine, freshwater, and terrestrial ecosystem dynamics; and managed ecosystems such as range, fisheries and agriculture in California. The course will also emphasize important skills to understand as a scientist or consumer of scientific information, including data collection, exploration and analysis; library-based research on ecological topics; and scientific and science writing.

The course prerequisite for UCSC students is ENVS 100 (ENVS 125) or BIO 20C (EEB), but students in other majors can enroll by contacting the instructor with a transcript screenshot. Cross-campus and non-ENVS students need one course each in statistics, ecology (e.g. ENVS 25 or BIO 20C) and writing, and can request a permission code by e-mail. This course serves as one upper-division (natural science) course in the UCSC ENVS and EEB majors.

Teaching staff

Instructor: Erika Zavaleta, Zavaleta@ucsc.edu

Teaching assistants: Daniel Hastings, dhasting@ucsc.edu; Tony Kovach, tokovach@gmail.com

Online office hours: Daniel or Tony will be available each week on Wednesday 11am-noon on Zoom for office hour drop in sessions. We are happy to provide additional offer meetings by appointment. To schedule time to go over course material, discuss careers/ internships/ other opportunities, or just connect to talk, send an email **to all of us** indicating desired length (10 or 20 min.) and giving us at least 3 options that are *at least 24 hours out*.

Course website and components

Course Website: Enrolled students can begin the class on 6/25/18. Login at <https://canvas.ucsc.edu/courses/15446>.

This course consists of (1) content materials (video field trips and narrated slide lectures) organized into 30 topic units, each with a quiz and one or more short writing prompts; (2) two laboratory exercises designed to be done on your own – one a statistics tutorial, one a field lab followed by data-sharing, a data analysis and writing, a writing assignment designed to help you develop your scientific writing and data reporting skills; and (3) a final exam.

Readings

The readings for the class will be drawn mainly from *Ecosystems of California*, edited by Harold Mooney and Erika Zavaleta. You should purchase the book in the format you prefer, either hard copy or as an e-book (<http://www.ucpress.edu/book.php?isbn=9780520278806>). Additional readings and resources will be provided in the form of online documents and/or sites.

Student Grading and Evaluation

Students' achievements will be evaluated through (1) participation in video field trips and lectures, via responses to writing prompts in each video and slide lecture, (2) participation in lab

discussion sessions and performance on the written lab assignments; (3) quizzes focused on informational content from the lectures and readings (one for each unit; and (4) a final exam.

Grading Breakdown

Lecture/ video field trip written responses	50%
Unit quizzes	30%
Final exam	20%

Interacting with Teaching Staff

Most of your work in this course will be independent, but staff are available in a variety of ways to support you. You'll first meet us during an online welcome session at the beginning of the quarter, where we'll tell you a little about ourselves and give you time to ask questions. A discussion forum will run all quarter, a place where you can both ask and answer questions and which course staff will follow and chime in on when helpful. You will also interact with staff during workshops for research laboratory exercises, in which the course staff will help you navigate data exploration, analysis, and formal reporting from the field projects. Finally, we will always be available by regular UCSC e-mail, Canvas email, or Piazza (discussion software within the course interface) and will aim to respond to you within 24 hours, or by the other side of the weekend or holiday.

Course schedule

The course includes 30 units organized into 5 modules, and with an introductory research lab and a field exercise tailored to the locations of enrolled students. The table on the next page gives you a course schedule overview with reading assignments and due dates for assignments. Although the online structure is set up to allow work at your own pace, you must complete modules by the deadlines. Each module becomes available *after* you have completed the previous ones.

We recommend that you tackle the unit contents in the following order: field trip(s) first, to get a look at the ecosystem in question and a sense of key characteristics and features, followed by the lecture – to guide you to the main points, then the reading – to reinforce the main points from lecture and delve into more detail – then the unit quiz.

The units need to be completed in order. Do not open the quiz before completing the other unit contents! The quiz within each unit, once opened, will only remain open for 40 minutes. All quizzes and the final exam are open-book, open-note, but they are too long in relation to the time available for you to look up every answer – you will want to review the material so that you are ready to deliver it mainly on your own. Quizzes, NOT the final, can be repeated once each for a new grade.

Academic integrity

In this course, all written work submitted is expected to be your own work, in your own words. Ideas, facts, paraphrased text or quotations taken from other sources next to be cited and referenced as they would in any academic research assignment. For the written responses to questions in each unit, we expect you to use your own words, not those from the readings or videos. All quizzes and the final are open-book, open-note in the course, but you are expected to

complete them on your own, without help from others. Violations of these expectations will result in penalties starting with loss of credit for the assignment in question. Please ask us if you have any questions about this, or refer to pages 1-3 and 18 of the UCSC Code of Student Conduct (<http://deanofstudents.ucsc.edu/student-conduct/student-handbook/pdf/100.0-code-of-student-conduct.pdf>)

Late assignments: late module syntheses and research lab assignments will be penalized 10%/day unless you obtain an extension in writing from the instructor or TA.

TOPIC	READINGS	Deadline
Live introduction (online meeting room)	Course syllabus	June 26, 5-5:30 p.m. PST
Module 0: INTRODUCTION	*M&Z = Mooney & Zavaleta	July 2
Unit 1: Introduction to California's ecosystems and this course	M&Z Ch. 1	
Module 1: ECOLOGICAL DRIVERS		July 10
Unit 2, Climate and Atmosphere	M&Z Ch. 2; Ch. 7 pp. 107-117; Ch. 14	
Unit 3, Fire as an Ecosystem Process	M&Z Ch. 3	
Unit 4, Geomorphology and Soils	M&Z Ch. 4; McPhee, " <u>Los Angeles Against the Mountains</u> " (reading avail. in Canvas)	
Unit 5, Population and Land Use	M&Z Ch. 5; Ch. 10 pp. 169-177	
Unit 6, Oceanographic Drivers	M&Z Ch. 6	
Unit 7, Biological Diversity and Invasions	M&Z Ch. 11, 13	
Module 2: MARINE ECOSYSTEMS		July 20
Unit 8, The Offshore Ecosystem	M&Z Ch. 16	
Unit 9, Shallow Rocky Reefs and Kelp Forests	M&Z Ch. 17	
Unit 10, Intertidal	M&Z Ch. 18	
Unit 11, Estuaries	M&Z Ch. 19	
Unit 12, Sandy Beaches	M&Z Ch. 20	
Unit 13, Coastal Dunes	M&Z Ch. 21	
Module 3: AQUATIC AND MONTANE		July 28
Unit 14, Wetlands	M&Z Ch. 31	
Unit 15, Lakes	M&Z Ch. 32	
Unit 16, Rivers	M&Z Ch. 33	
Unit 17, Montane Forests	M&Z Ch. 27	
Unit 18, Subalpine Forests	M&Z Ch. 28	
Unit 19, Alpine Ecosystems	M&Z Ch. 29	
Module 4: LOWLAND TERRESTRIAL ECOSYSTEMS		August 5
Unit 20, Coastal Sage Scrub	M&Z Ch. 22	
Unit 21, Grasslands	M&Z Ch. 23	
Unit 22, Chaparral	M&Z Ch. 24	
Unit 23, Oak Woodlands	M&Z Ch. 25	
Unit 24, Coast Redwood Forests	M&Z Ch. 26	
Unit 25, Deserts	M&Z Ch. 30	

Module 5: MANAGED SYSTEMS AND STEWARDSHIP		August 14
Unit 26, Marine Fisheries	M&Z Ch. 35	
Unit 27, Forestry	M&Z Ch. 36	
Unit 28, Range Ecosystems	M&Z Ch. 37	
Unit 29, Agriculture	M&Z Ch. 38	
Unit 30, Urban Ecosystems	M&Z Ch. 39	
Final exam available to take		August 16-17

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first week of the Summer quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu

Computers and Data Analysis

For this class you will need:

- Reliable computer
- Reliable internet connection
- Webcam and a microphone (built-in or peripheral)
- Modern web browser (Firefox, Safari, or Chrome)
- Word or similar word processing software
- Excel or similar data entry and manipulation software
- Google Drive to share data and documents
- Other required software will be available on the course website

Course Accommodations to Ensure Access for All Students

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your [“Accommodation Authorization Letter”](#) from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, as soon as possible in the academic quarter, preferably within 1 week. I also am open to and want to encourage you to discuss with me ways I/we can ensure your full participation in this course. If you have not already done so, I encourage you to learn more about the many services offered by the DRC. You can visit their website (<http://drc.ucsc.edu/index.html>), make an appointment, and meet in-person with a DRC staff member. The phone number is [831-459-2089](tel:831-459-2089) or email drc@ucsc.edu.

Learning Objectives for the Course

Students will be able to describe the interacting forces that underlie the evolution and maintenance of California's exceptional diversity of ecosystems. Students will be able to describe the characteristic components of California's major ecosystems and the processes that give rise to and maintain this character. Students will be able to compare the relative contributions of these processes to shaping different ecosystem types and to describe how research in California's ecosystems has contributed to general ecological theory. Students will be able to critically evaluate management, restoration and conservation approaches proposed for California's diverse ecosystems. Students will be able to research, individually and collaboratively, specific topics in the ecology and stewardship of California's ecosystems in greater depth. Finally, students will be able to analyze and evaluate tradeoffs between the human benefits derived from California's ecosystems and their degradation.

Major-specific Learning Outcomes Addressed

This course addresses the following learning outcomes of the Environmental Studies major at UCSC:

2. Describe the structure and functioning of major physical and ecological components of the earth's systems.
3. Access and analyze a complex literature addressing specific topics in environmental studies, and evaluate the usefulness and limitations of individual sources of information.
4. Demonstrate effective oral and written communication skills.

This course addresses the following learning outcomes of the Ecology and Evolutionary Biology major at UCSC:

1. Students will demonstrate broad-based knowledge of the fundamentals of Ecology, Behavior, Evolution and Physiology and the relationships among these disciplines.
3. Students will demonstrate skills in identifying, accessing, comprehending and synthesizing scientific information, including interpretation of the primary scientific literature. This includes understanding key questions and hypotheses, interpreting results and conclusions, and evaluating quality through critique.
5. Students will demonstrate an ability to understand and apply fundamental quantitative skills, including models and statistical analyses, so as to properly interpret published research and apply such skills in their own research.
6. Students will demonstrate the ability to communicate original scientific work in the form of a scientific paper, as well as in oral or poster presentations.