

ESM 260 APPLIED MARINE ECOLOGY - Winter 2025

Lectures: Monday & Wednesday: 8:00 – 9:15 AM, 1424 Bren Hall

Instructor

Hunter S. Lenihan

Office Hours

3428 Bren Hall; W; 9:15-10:15 AM.

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The major objectives of the course are to learn ecological field assessments used to detect the impacts of human activities in the marine environment, to explore ideas and case studies in marine restoration and resource management, and to learn key research skills. The course is structured around lectures, discussions, readings, quantitative problem sets, and the crafting of a research proposal. Lectures will be focused on case studies involving the application of ecology in marine environmental problem solving, particularly those related to impact assessment and restoration. Discussions will explore our collective understanding of major issues in marine management and ideas for problem solving. And we have a great group of guest lecturers.

Students have the choice of working on one of two course projects. The first choice is three quantitative problem sets designed to formulate and address research questions, display, analyze, and interpret ecological data, and report findings in writing. This project alternative helps you improve your skills in recognizing and interpreting patterns in ecological data collected from the marine environment. The second project choice is to craft and draft a research proposal. This project alternative provides the opportunity dive deeply into a subject matter, for example Carbon Dioxide Reduction (CDR), by generating a research question(s), and designing research to address the question, in the form of an 8-page research proposal, as well as the presentation of the proposal in a 10 min talk. Students will work with me to develop their idea for a proposal, as well as explore potential proposal topics in an open discussion with peers during a class meeting. Proposals are due at the end of the last week of classes. There are no exams in the course.

Textbook: Schmitt, R.J. & C.W. Osenberg (eds). 1996. Detecting Ecological Impacts: Concepts & Applications in Coastal Habitats. Academic Press. *Provided free online.*

Lecture / Reading Assignment Schedule

<u>Week</u>	<u>Date</u>	<u>Lecture Topic</u>	<u>Reading</u>
1	Jan 6	Introduction/Ecological dynamics 1	Textbook- Ch. 1
1	Jan 8	Ecological dynamics 2	
2	Jan 13	Field impact assessments: BACIPS	Textbook- Ch. 3
2	Jan 15	Field impact assessments: Other strategies	Textbook- Ch. 6
3	Jan 20	Holiday	
3	Jan 22	Kelp forest restoration (<i>Dr. Dan Reed</i>)	
4	Jan 27	Discussion – Ocean management challenges	Textbook- Ch. 10
4	Jan 29	Management experiments: oyster reef restoration	
5	Feb 3	Coral reef disturbance and resilience	Textbook- Ch. 14
5	Feb 5	Eco-technology for restoration (<i>Dr. Andrew Brooks</i>)	
6	Feb 10	Ecological role of parasites (<i>Dr. Kevin Lafferty</i>)	
6	Feb 12	Ecological impacts of fishing	Worm and Lenihan (2014)
7	Feb 17	Holiday	
7	Feb 19	Small-scale fishery management	Video: Dr. Ray Hilborn
8	Feb 24	Marine reserves as conservation and fisheries tools	Paper TBA
8	Feb 26	Rahui in Tahiti: Community-based management	Paper TBA
9	Mar 3	Beach ecology in a changing climate (<i>Dr. J. Dugan</i>)	Paper TBA
9	Mar 5	Aquaculture and CDR	Paper TBA
10	Mar 10	<u>Student proposal presentations</u>	
10	Mar 12	<u>Student proposal presentations</u>	

Quantitative Problem sets

Set 1: Identifying patterns in nature

Due end of week 3

Set 2: Hypothesis formulation

Due end of week 5

Set 3: Tests of hypotheses & management actions

Due end of week 7

Written research proposal and oral presentations

Students to begin working with Hunter to develop idea as soon as possible, and have their proposal idea set by the end of week 4.