

ESM 237 - Climate Change Impacts and Adaptation Winter 2024

Instructor: Samantha Stevenson, sstevenson@ucsb.edu

Course Lecture Times: Tuesday/Thursday 9:30-10:45am

Office Hours: By appointment, email to arrange

Course Objectives

- To provide an understanding of the expected impacts of climate change as a function of spatial and temporal scale
- To become familiar with the techniques used in generating future projections on both global and regional scales, and to understand the limitations of these datasets
- To understand the process of generating climate adaptation plans, and the costs and benefits associated with these plans in different stakeholder groups

My goal for this course is to provide you with the tools necessary to create your own assessments of climate change impacts for a system of your choice, and to understand the tradeoffs involved in the creation and implementation of climate adaptation plans.

Course Content Areas

- Climate change projections and future scenarios
- Impact assessments
- Techniques for downscaling climate datasets
- Applying climate projection data to real-world systems through empirical modeling
- Climate adaptation plans

Skill Areas

- Applying systems science approaches to conceptualize the processes by which climate change will affect a given sector/region/environmental problem
- The ability to choose the appropriate type of model (conceptual, empirical, numerical) to represent a system of interest, and to use it to generate useful quantitative information on climate change impacts
- An understanding of the properties and limitations of global climate models and future climate scenarios, as well as the ability to use their output to estimate climate change impacts
- The capacity to effectively critique existing adaptation plans based on scientific principles, as well as creating the broad outlines of new adaptation plans.

Course Assessment

Your performance in this course will depend on four homework assignments and a final project/presentation illustrating an adaptation plan developed by your group.

Component	% Total
Homework assignments (4 in total)	55
Participation in in-class discussion activities	10
Adaptation Project Presentation	10
Adaptation Project Report	25

Course Schedule (subject to change)

See Canvas for specific lecture topics each week, reading materials/slides, assignments, and due dates.

Weeks 1-2: Climate Change and Global/Regional Trends

Weeks 2-4: Models, Climate Models, and Downscaling

Weeks 5-6: Adaptation Planning Fundamentals

Weeks 7-8: Case Studies in Climate Adaptation Across Sectors

Weeks 9-10: Student Presentations of Final Projects