

**BISC 499: Coastal Biodiversity,
 Sustainability & Conservation**
4-Units
USC Molecular and Computational Biology
Dornsife Maymester Program
Wrigley Marine Science Center, Catalina
Island
National Taiwan University, Taipei, Taiwan

Instructors and Guest Lecturers:			
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Course Overview

In every known place on earth, ecosystems have shifted and altered over geologic time to accommodate an ever-changing climate and now, a swiftly burgeoning human population. New and intense anthropogenic pressure has ushered in an era characterized by warming ocean temperatures, habitat loss, and extinction events to name only a few. Such deleterious events in our history necessitate a new wave of scientific, social, and political progress characterized by cognizance of environmental conservation including current global conservation initiatives, national policy-driven acts protecting fragile ecosystems, and sanctions placed on threatened and endangered species. BISC 499 will cover introductory topics in marine coastal conservation initiatives, including topics in fisheries biology and the history of aquaculture, conservation biology, and biodiversity.

The first two weeks of this four-week course will take place at the USC Wrigley Marine Science Center where students will balance lab-work with conservation-based lecture topics and daily field-work assignments. Due to the proximity of WMSC to two marine protected areas, students will be encouraged to explore topics in coastal ecosystem management. Lecture topics will cover the historical development of aquaculture, current case studies of how it is practiced across the globe, and how various approaches to managing it sustainably are being developed. A global outlook

in aquaculture and conservation biology will be reinforced through the structure of this course being divided between National Taiwan University (NTU) in Taipei, Taiwan and USC's Wrigley Marine Science Center (WMSC) in Los Angeles, CA. The two-week portion of the course in Taipei will include lectures encompassing diverse topics in urban ecology, conservation biology and biodiversity and will also have a field component. Students will explore these topics *in situ* through trips to intertidal zones and subtropical forests such as the Lienhuachi Experimental Forest (LEF).

The overarching focus of this course will be to ensure students understand the basic tenets of conservation biology as well as how to design and conduct field experiments. Data aggregation and analysis skills will also be introduced and honed. At the end of the course, students will be required to present on their topic. Further, due to the international component of this course, students will be provided with an amazing opportunity for cultural exchange.

Course Learning Objectives

- To be able to demonstrate, through written and oral presentations, written exams, as well as analytical reports based on field data, the impacts of anthropogenic stressors on coastal ecosystems.
- Examine current and past sustainability initiatives and review effectiveness as well as determine what is meant by “sustainability” from a policy perspective
- To demonstrate an understanding of the history of aquaculture, its current practice, and how historical and scientific knowledge has been synthesized to develop sustainable aquaculture.

Prerequisites

This course has no formal pre-requisites, but students should have had an introductory course in biology.

Course reading & supplementary materials

Prior to the start of the course, all assigned reading including book chapters, scientific papers, and case studies will be announced as well as posted on Blackboard. Lecture materials will be made available via blackboard before each lecture session. As an upper division, 4-credit course, in-depth analysis of scientific literature is required in addition to the ability to communicate concepts critical to the main themes of the course.

Course format

Weeks 1-2: Wrigley Marine Science Center (Last Two Weeks of May)

- Students will be introduced to the concept of conservation biology and coastal ecosystem sustainability
- Students will be introduced to the concept of coastal ecosystem sustainability initiatives on Catalina, including topics surrounding two marine protected areas proximal to Two Harbors

- Students will be trained in the scientific field methodology necessary, and will be provided resources, to research their own chosen topics in coastal habitat conservation
- Contemporary and past aquaculture initiatives will be taught as a way to introduce global conservation initiatives through growing fishing industries. Case studies will include aquaculture start-ups in coastal California as well as historical aquaculture initiatives in Taiwan

Weeks 2-4: NTU, Taipei, Taiwan (First Two Weeks of June)

- Students will travel to various sites within Taiwan to further explore concepts of ecosystem sustainability and anthropogenic impacts
- Interact with researchers and lecturers from NTU to broaden understanding of biodiversity and conservation initiatives
- Develop oral and written presentations on a topic of their choice to demonstrate an understanding of coastal biodiversity and sustainability within historical and global contexts

Course grading & breakdown

Daily attendance and participation are required. Participation in group discussions, field work assignments, lab experiments, and all related work will be included in the final grade.

Grading Breakdown	Percentage
Readings and Discussion (group and individual work)	15%
Data Collection and Field-Exercises (group and individual work)	15%
Oral presentation 1 (Individual)	20%
Written Field Reports and Data Analysis	20%
Oral Presentation 2 (Individual)	30%
	Total 100%

Readings and Discussions

Groups of students will have the option to choose their own or be assigned pertinent case studies. Case studies will serve as guides to introduce students into the world of conservation biology and will serve as guides for students as they design their own field-research project. Each group will be tasked with thoroughly understanding their case study as well as the eventual outcome and scientific methods used in each. A final class discussion will see all groups discussing their case studies in a free-exchange of information and applied knowledge. Students are individually responsible for their final oral presentation as well as written field reports and data aggregation.

Field Exercises

Students will be responsible for designing their own field exercise for the two-weeks spent on Catalina. Data collection and field reports will be graded for each student individually. Standard scientific format will be expected for field reports i.e. Abstract, introduction, methods, discussion, literature cited (Case studies?), tables and figures. Field trips will be coordinated for each group and will be pertinent to their specific field exercise.

Final write up:

The final writeup will be a ~10 page (not including bibliography) paper written in scientific format. Final presentations will be a ~20 minute oral presentation based on the paper. (Note that final presentations during week 16 will be scheduled flexibly to avoid interfering with your finals). Your professors are most interested in the hypothesis (or hypotheses) addressed, the data and analyses used to test that hypothesis, and the rigor of the scientific conclusions drawn.

Presentations: Students are expected to submit their presentations to the faculty for review and discussion prior to the course meeting. The presentation will include several components:

- A description of the state of the field prior to the paper,
- The question(s) addressed by the paper
- Experimental methodology, data, and conclusions,
- A critique: what are the strengths and weaknesses of the paper, what questions remain, and how would they be addressed by contemporary scientists?

Independent research project

In the fourth week of the class the students will be asked to design, plan and prepare their own research project based on skills they have learned in the class. During the 4th week the students will analyze the samples, process the data and prepare a final report on their research project. Results will also be presented in the form of a public symposium on Friday, June 13, which is open to all staff and faculty, as well as to family and friends.

Additional course information & policies

Missed Exams: Missed exams will automatically receive a grade of zero unless the student has an excused absence. Missed exams may be re-taken at the discretion of the instructor.

Late Assignments: As this class is taught within an expedited time-frame, students are encouraged to complete all assignments in a timely and efficient manner so that they are fully-present and involved at each class discussion and field day. To help sustain this effort, late assignments will be downgraded 15% each day that the assignment is overdue.

Course Costs, Travel Information and Housing

Tuition & Fees: \$2,000 USD

Students will be provided a detailed breakdown of course costs before enrollment for the 2020 Spring Maymester Session begins.

Students will be responsible for their own airfare (See below) at an estimated cost of \$1,200.

Students will be responsible for breakfast and lunch for one week in Taipei and SOME dinners at an average cost of \$5-10 USD/meal.

Travel information:

Most international flights land at Taoyuan International Airport (TPE). The journey from Taoyuan International Airport to central Taipei is about 40 kilometers. If USC students can travel together, transportation will be arranged from the airport to NTU's campus

Prior to traveling outside of the US, the class will first visit the [USC Wrigley Marine Science Center \(WMSC\)](#) on Catalina Island for 7 days. At the WMSC, students will be housed in dormitory facilities.

Next, the class will travel to Taipei, Taiwan, where we will stay at the [Hsiu Chi House](#) during the first week. Students are responsible for coordinating their arrival and departure plans to and from Catalina and Taipei, Taiwan.

All USC students are required to have sufficient health and accident insurance protection during their study abroad program. To ensure proper coverage, all students going abroad must enroll in either USC Overseas Policy or the USC Student Health Insurance Plan for the term they are abroad (see the USC [Student Affairs website](#) for more information).

All U.S. citizens are required to travel with a U.S. passport. You must have at least 6 months valid on your passport, from your return destination date. Please refer to the [U.S. Department of State website](#) for more information. Before visiting Taiwan, you may need specific vaccinations and medications for vaccine-preventable diseases and other diseases you might be at risk for at your destination. Consult with your health-care provider to determine what you will need, depending on factors such as your health and immunization history, areas of the country you will be visiting, and planned activities. Please refer to the [Centers for Disease Control and Prevention website](#) for details. The instructors will also keep you updated based on current information available to them.

Finally, all students must sign and/or complete specific documents (e.g., Travel Release Form, Medical Treatment Authorization Form, Roster Spreadsheet) that are required by the USC Student Affairs Office at least 7 days before departing overseas. The course instructors will distribute, review and complete these documents with each student during an orientation session before the start of the Spring Maymester session.

Course Schedule: A Daily Breakdown for Catalina & Taipei

Catalina:

Tentative Schedule (color codes: lectures; labs; field projects; field trips; discussions)			
Day, Date	Morning	Afternoon	Readings
M 18-May	Lecture: Introduction to Conservation Science	Lecture: Coastal Ecosystem Management and Protected Areas	TBD
T 19-May	Lecture: Introduce & Invasive Species, 1 Lecture: How Pollution Affects Activity, data gathering	Field Trip: Catalina MPAs Field Project: Transect & Quadrat Surveys	TBD
W 20-May	Lecture: Policies to Protect Biodiversity Lecture: How Pollution Affects Activity, data analysis	Field Project: Transect & Quadrat Surveys, MPAs	TBD
Th 21-May	Lecture: Protected Areas Lecture: Biodiversity	Quantitative Data Analysis Lab	TBD
F 22-May	Lecture: Ecosystem Services and Coastal Ecosystem Management	Quantitative Data Analysis Lab	TBD
Final Field Report Due Friday, May 22			
M 25-May	Lecture: Climate and Ocean Change Lecture: History of U.S. Fisheries Management	Discussion: Aquaculture Initiatives	TBD
T 26-May	Lecture: Magnuson Stevens Fisheries Act	Discussion: Sustainable Fisheries Management	TBD
W 27-May	Lecture: Consercation	Discussion: Sustainable Fisheries Management	TBD
Th 28-May	Lecture: Magnuson Stevens Fisheries Act	Discussion: Coastal Marine Resources, Nationally & Globally	TBD
F 29-May	9:30am: Oral Presentations		TBD

Taipei:

*Day 0, International students arrive and check-in Hsiu Chi House			
Day, Date	Morning	Afternoon	Readings
M 1-Jun		Orientation; NTU Museums; Welcome Dinner	TBD
T 2-Jun	Lecture 1: Urban Ecology	Lecture 2: Biodiversity on Campus Campus Tour	TBD
W 3-Jun	Field Trip: Taipei Zoo/MaoKong District		TBD
Th 4-Jun	Lecture 3: Water: The most Precious Resource	Field Trip: Taipei Feitsui Reservoir/Taipei Water Park	TBD
F 5-Jun	Lecture 4: Conservation: Education Programs	Field Trip: Taipei Zoo	TBD
Final Field Report Due Friday, May 22			
M 8-Jun	Field Trip: Lienhuachih Experimental Forest (LEF)	Introduction to Fushan Botanical Garden & Walk in the Woods	TBD
T 9-Jun	Field Trip: Lienhuachih Experimental Forest (LEF)	Bird Watching Tour: Optional Lecture 5: Plant Diversity & Lecture 6: Long-Term Ecological Studies & Lecture 7: Insect Diversity After Dinner Talk: Busy Nightlife for Animals I	TBD
W 10-Jun	Field Trip: Lienhuachih Experimental Forest (LEF)	Lecture 8-10: Global Warming; Population Genomics; Plant/Insect Interactions After Dinner Talk: Busy Nightlife for Animals II	TBD
Th 11-Jun	Departure for I-Lan	Marine Field Station Field Trip: Intertidal Zone Diversity Diversity on the Dining Tble, Bus to Taipei	TBD
F 12-Jun	Field Trip: Yang-Ming-Shan National Park	Lecture 11: Citizen Scientist Programs Field Trip: Taipei Museum Final Presentations & Farewell Party	TBD

Statement on Academic Conduct and Support Systems

Academic Conduct:

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 Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. 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>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student. Ex: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu

Application Checklist

- Application form
- Stars Report (Accessible on OASIS)
- Acknowledgment that you have reviewed the syllabus for the course
- If possible, please scan documents into one PDF file and email to mharden@usc.edu.