

Oregon State University Department of Fisheries and Wildlife

FW 499: Ecology and Conservation of Hawaiian Coral Reefs




Dr. Susie Dunham and Dr. Jason Dunham

Earn credit on the Big Island in our new Summer Course!

This course is an exploration of the ecology of marine ecosystems in the Hawaiian islands. Using ecology, evolution and conservation biology as organizing themes this course will investigate the structure of coral reef communities and ecosystems then focus on the unique characteristics of these ecosystems that make them vulnerable to disturbance.



The course will be offered in Session 3 of Summer 2017 and combines approximately 180 hours of instruction, online activities and assignments for 6 credits. Through field experiences, lectures by faculty & guests, and class discussions students will learn about:

-  the dynamic interactions between marine organisms in relation to biotic and abiotic environments,
-  the life histories of marine organisms and interrelationships within coral reef communities,
-  the role of coral reef communities in marine ecosystems, and conservation issues relevant to coral reef ecosystems in Hawaii.

Fisheries and Wildlife Majors can use this course to fulfill the Habitats and Ecosystems requirement or as part of their Specialization.

Application Deadline: March 15th, 2017!

Apply online:

tinyurl.com/FWHawaii2017

Contact Program Leaders Dr. Susie Dunham or Dr. Jason Dunham for more information:

susie.dunham@oregonstate.edu

dunhamja01@gmail.com

Class Dates:

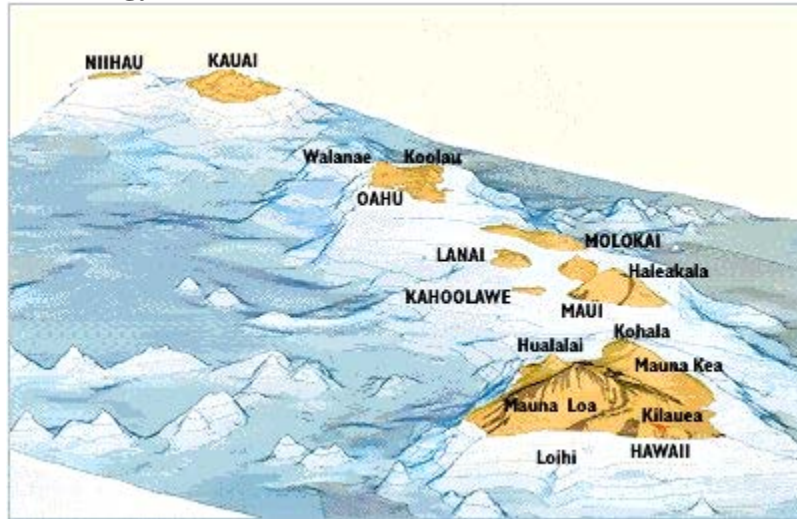
June 26 - August 18

July 22-August 05 in Hawaii (Big Island)

Students will be doing online coursework during periods when they are not in Hawaii.



FW 499: Ecology and Conservation of Hawaiian Coral Reefs (6 credits)



Professors:

- Dr. Susie Dunham: Nash 104G, 541-737- 2642, Susie.dunham@oregonstate.edu
- Dr. Jason Dunham: dunhamja01@gmail.com

Office Hours:

- June 26- August 18: By appointment
- July 22 - August 5: Professors will be available 24 hours/day; 7 days/week

Prerequisites:

- Required/Enforced - BI 211/ 212/ 213 or BI 204/205/206.
- Recommended – BI 370
- Ability to swim 200 meters continuously, without resting and without aids such as fins, hand paddles, or any type of flotation device.

Texts:

- Gulko, D. 1999. Hawaiian Coral Reef Ecology. Mutual Publishing, Honolulu, HI
- Randall, JE. 2010. Shore Fishes of Hawaii. UH Sea Grant, Honolulu, HI
- Additional readings will be made available via the course Canvas site

Required supplies: See Hawaii 2016 Packing List on course Pre-departure Studio Site

Course Description:

This course is an exploration of the ecology of marine ecosystems in the Hawaiian islands. Using ecology, evolution and conservation biology as organizing themes this course will investigate the structure of coral reef communities and ecosystems then focus on the unique characteristics of these ecosystems that make them vulnerable to disturbance. The course will be conducted over an eight-week period including six weeks for online instruction and two weeks carrying out field studies in Hawaii (Big Island). This course combines approximately 180 hours of instruction, online activities and assignments for 6 credits. Through field experiences, lectures by faculty & guests, and class discussions students will learn about the dynamic interactions between marine organisms in relation to biotic and

abiotic environments, the life histories of marine organisms and interrelationships within coral reef communities, the role of coral reef communities in marine ecosystems, and conservation issues relevant to coral reef ecosystems in Hawaii. Short lectures will be given by faculty to introduce key concepts. In addition to lectures, we will use a discussion-based format to explore the assigned readings. During these discussions we will highlight key concepts, relate concepts to one another, and relate field experiences to the topic at hand. This course will also cover methods of description and analysis of ecological communities. Students will conduct observational research during frequent field excursions to reef ecosystems and analyze data from several instructor-designed research projects and one student-designed project.

Student Learning Outcomes:

- i. Identify connections between the fields of evolution, ecology and conservation biology
- ii. Identify conservation issues relevant to coral reef ecosystems
- iii. Identify the common fish species associated with Hawaiian Coral Reefs
- iv. Describe the ecological and evolutionary processes that control species diversity present in coral reef ecosystems
- v. Use observational sampling techniques to collect data in aquatic ecosystems
- vi. Summarize field data in graphical, tabular and written formats
- vii. Evaluate field observations using ecological and evolutionary contexts
- viii. Apply investigative research methods to study organisms in marine environments
- ix. Communicate scientific research findings to peers using conventions appropriate for the Fisheries and Wildlife discipline.

Academic Evaluation (Online Component):

Literature Notebook (will start online and continue in Hawaii):

During both the online and off-campus portions of the course we will read several primary literature articles that emphasize selected lecture topics and prepare you for our time in Hawaii. Your literature notebooks should contain two short entries for ten of the assigned articles. The first entry should be a summary of your thoughts while reading the article, including questions to bring to the discussion board or on-site class meetings. The second entry should summarize the class discussion of the article. For papers discussed via the online discussion board, this second entry should be written after the due date for making new posts to the discussion board has closed – that way you can capture the complete discussion in your summary. Class discussions will be held online in the first two weeks of the class and in person while we're in Hawaii. I expect that you'll make hand written notes while reading the papers and either reading discussion board posts or listening to in-class discussions. Please keep your literature notebook in electronic form using Word (so you'll use your hand written notes to produce the final assignment). Entry length should be kept to 250-300 words – so 500-600 words per assigned paper.

Paper Presentation & Discussion:

For eight of the assigned primary literature articles, ALL students will be assigned the following tasks (so basically what you need to do for the literature notebook assignment).

- 1) Reading the paper!

- 2) Writing a short summary that outlines the paper you were assigned and raises 2 to 3 questions for discussion.
- 3) Writing a short summary of your thoughts about the online discussion

Each student will be 'in charge' of moderating the discussion for one paper (so you should know your assigned paper quite well). I will make these assignments on the first day of class in an announcement. Your literature notebook should indicate the article you were assigned to present to the class. For the student leading the discussion, there will be an additional 50 points assigned for the discussion of this paper (in addition to what is already assigned for the literature notebook). For this one paper you must:

- a. Before the day assigned to the discussion of the paper you should make a discussion board post summarizing the major take-home points from the article.
- b. Before the day assigned to the discussion of the paper you should draft 2 to 3 discussion board prompts and send them to Susie (Susie.dunham@oregonstate.edu) for final approval for final approval and posting. I must have your draft discussion board prompts before the day that the assigned reading is due.
- c. Moderate the discussion of your assigned article – this means you should be checking and contributing to this particular discussion board throughout the day. You don't need to be glued to your computer all day – but you should be checking in and contributing in a way that keeps the discussion lively every few hours.
- d. Write a summary of the associated discussion board after the final posts have been made. This summary can be duplicated in your literature notebook entry for the paper you were assigned. This summary will also be posted to the course Canvas site for all students to read.

Taxonomic Preparation Presentation:

You need to have some familiarity with reef fish identification before we get to Hawaii. I will divide you into groups of two students (8 students = 4 groups) and each group will be responsible for becoming 'taxonomic experts' on a family of reef fish (the four most diverse that are easily seen anyway – others you'll pick up in the field). It will be your responsibility to educate all the other students about how to recognize common species in that family while snorkeling. During the online portion of the course these groups will be responsible for preparing a presentation about their group of fish that includes i) description of characteristic behaviors, some details on their feeding ecology, and tips on identifying at least 5-10 common species. This presentation is worth 50 points. Your primary reference for building your presentation is Randall (Shore Fishes of Hawaii), other resources posted on the Canvas site, and various internet sites. After your presentation is made available to the class, group members will be responsible for moderating a discussion board where students are able to provide feedback on the presentation, ask clarifying questions and supply additional ID tips that they may have encountered in their own reading.

Your presentation should be constructed using PowerPoint (available in Microsoft Office). You can create an animated slide show with enough text support to walk other students through the basics of identifying the fish in your group. If you want to get into some new technology, you can also create a video lecture using a video capture tool like Kaltura (I'll post resources about this tool and some tips for using PowerPoint on the Canvas website). Students should be able to read through (or listen to) your presentation in a 15 minute period (so no more than 30 slides). I expect this to be a collaborative process with your assigned partner. Both students will receive the same grade on the presentation. Your role as

'taxonomic expert' for your assigned group of fish will continue once were in the field – so make sure you're working as a team!!

Regardless of how you prepare your presentation, you need to submit the power point or video link to Susie via email (Susie.dunham@oregonstate.edu) the day before your discussion is assigned.

Discussion Boards:

This is a senior-level ecology course. As such, I expect you to make significant contributions to each of the assigned discussion boards. At a minimum you must respond to the discussion board prompt set by the student who was in charge of leading the discussion and respond to posts made by at least two other students. I also expect you to follow up by reading responses made to your posts and answering any questions posted to you by other students. Discussion boards will open on the day the paper is assigned and you'll have 48 hours to complete each assignment. In the case when discussion board assignments run up against a weekend – I'll give you the entire weekend to complete the assignments. There will be 12 assigned discussion boards during the online section of the course. Participation is worth 10 points per discussion board for 120 points total.

This is also a 6-credit course crunched into an 8-week summer session. That means that we'll have discussion board assignments regularly. You're going to need a way to track what you've already done and what is still due.

Quizzes:

There will be two short, 40-point quizzes administered during the online weeks. All content covered in lectures, assigned readings, and discussion boards that have been fully completed prior to the quiz will be considered examinable. Quizzes will be open book and open note and you will have 24 hours to complete them once they are made available on Canvas. I'll set Canvas so that each quiz becomes available at 12:00 AM on the day it is assigned and closes at 11:59 PM on that same day. Questions will be short essay in format and will require you to integrate content from multiple sources. If you have kept up and are well prepared for the quiz it should only take you an hour to complete these assignments. Please complete each quiz using Microsoft Word and upload to Canvas.

Academic Evaluation (Hawaii Component):

Field Notebooks:

Natural history is the study of organisms in their natural environments. The discipline emphasizes interpretation of field observations of form, function, behavior, life history, and interactions. Literally, the goal is to reconstruct the history of biological phenomena observed in the field. What is the context in which a particular behavior or interaction evolved? Natural history is generally not an experimental discipline. It relies on objective and unbiased observation. In this course we will devote considerable attention to observation and discussion of diverse taxa. Most of our focus will be on fish and invertebrates associated with corals. Whenever you observe an organism in its natural environment you should be concerned with three levels of detail:

- a. Objective description of the organism, phenomenon, or event (what, when, where)
- b. Interpretation of biological, ecological or evolutionary context (how, why)

- c. Your thoughts as a naturalist (what did you learn, how does it connect to things that you have learned in other settings outside of this class)

Information compiled in your field notebook will complement many other class assignments. As a result, the quality of your field notebook will be a primary instrument for evaluation on its own and will influence your performance on other assignments. Field notebooks will be graded at the end of the course. You should check in with us regularly during the trip to get feedback on your notebooks rather than waiting to cram in all together at the end. To receive full credit your field notebook must contain a minimum of twelve (12) daily entries. This should not be difficult as you should make all field notebook entries while we are *in the field*. If you are fastidious about recording all data and observations throughout the course of each day you should not have to do much on this assignment in the evenings. It is critical that you take the time to keep your handwriting neat and clear at all times. ***We cannot and will not grade entries that we cannot read!!!***

Field notebook entries are to be made on a daily basis. You should structure your notebook by leaving 2-3 pages in the front for a table of contents that will be updated at the end of each day. The table of contents should include both the name of the daily activity, the date of the activity and corresponding page numbers. Pages in the rest of the notebook should be numbered consecutively. In general, field notebook entries should contain a heading that includes a brief title or description of the activity, the date, location (site name and general directions), weather conditions and other students involved. Following this heading you should produce a short paragraph or list of objectives for work completed that day. Your instructors will clarify these objectives on a daily basis. The remainder of each entry should at a minimum include (but is not limited to):

- ✓ a list of new species seen that day (you'll gradually build a species list for the trip)
- ✓ notes on key identifying characteristics of new species (seen for the first time on that day) - include sketches when appropriate or as time allows
- ✓ notes on the relative abundances of recorded species
- ✓ notes on observed habitat or species assemblage associations for observed species
- ✓ notes on intra- or inter-specific interactions (when observed)
- ✓ sketched maps of the study area when relevant
- ✓ Data collected for field labs research projects (transcribed from your dive slate)

In describing structures, associations or behaviors, attempt to be unbiased: i.e., describe the structure or behavior without interpreting its use or purpose. When you add thoughts and interpretations identify them as such and then speculate, propose hypotheses, or discuss your ideas.

The directions provided above are intended to give you a general framework for what we will be looking for in field notebook entries. On many days your instructors will identify areas that require more or less focus within this framework. **It is your responsibility to be sure you are clear on what we expect at the start of each day.**

Field Labs:

You will be investigating different aspects of coral reef ecology via a set of directed field assignments while we are in Hawaii. These projects will involve making observations and collecting data as a class and will be evaluated by means of quizzes or short written research reports (usually a graph, table, and statement of research findings). You will work with a partner during field activities but the written

report you turn in should be your original work. The topic and grading criteria for each of these reports will be provided with each assignment.

Class Project:

We will complete one project as a class that will address the measurement and comparison of reef fish diversity. This class project is intended to provide you with experience in experimental design and statistical data analysis. Your work on the class project will be evaluated using three short assignments similar to what you'll turn in for field labs but different in that they are interconnected and build on each other. Although we will collect the data for this project as a group, all class project reports will be completed individually and must be computer generated. Each final report will consist of:

- A statement of project objectives, hypotheses and predictions
- A description of the study area and all methods used to collect data
- Project results
- A brief discussion that relates project results to proposed hypotheses and predictions

Participation:

Full participation by all class members is critical to the success of experiential field courses. Because of its importance, participation will constitute 10% of your grade. Participation will be evaluated at two levels (academic and logistical) each worth 5% of your total grade each.

Academic:

Attendance is required for all activities. All field trips are absolutely required. *Involuntary* debilitating illness is the only allowable excuse for not participating in daily academic activities. Your presence alone is not enough to garner you academic participation points. We also expect you to be 'academically engaged' in all activities. This means that you are taking notes, asking questions, and are actively participating in group discussions. It also means that you are focused on tasks assigned to you during class activities. This is not intended to be punitive. This sort of evaluation will keep you from getting behind on daily assignments during the trip and eliminate the need for cramming to complete assignments.

Logistical:

You represent yourself and Oregon State University while we are in Hawaii. You should show consideration for others at all times and refrain from behavior that may reflect badly on our group. Poor performance in any one of the listed items below will result in substantial loss of participation points.

Logistical participation includes the following:

- 1) Being prepared and ready to load up on time each day
- 2) Assistance with scheduled shopping and other logistical activities
- 3) Courtesy toward others / Team player
- 4) Compliance with reasonable requests for assistance
- 5) Condition-free positive attitude (we are in Hawaii after all)
- 6) Financial responsibility
- 7) Appropriate personal hygiene
- 8) Proper care of materials and equipment (your own and others)
- 9) Enthusiastic participation in all activities

Kapu (Translation = Forbidden):

Again, you need to remember at all times that we represent Oregon State University on this trip. We recognize that you are all adults, but the instructors of this course are responsible and held legally accountable for your safety 24/7 regardless of whether we are actively engaged in academic activities or not. Obviously, you must obey local laws. However, if at any time your behavior exceeds the bounds of civility or decency, or otherwise infringes on the rights of others, you will be excused from the group, sent home on the next available flight and given a failing grade in this course. These are the things that will result in your expulsion from the course. If you participate in any of the activities listed below you will be immediately transported to the nearest airport and asked to depart at your expense.

- 1) SAFETY (Our #1 Priority!!!)
 - a. Endangering the safety of yourself or any other person purposefully or through negligence
 - b. Willful disregard for safety policies required by course instructors (e.g., signing in & out during free time; swimming alone)
- 2) Abuse of drugs or alcohol – this is a dry course – no drinking for the duration for students or instructors.
- 3) Academic dishonesty
- 4) Unprofessional, inappropriate or illegal activities
- 5) Repeated nonparticipation in academic or logistical activities

Grading: Grades and credit will be awarded as follows:

Assessment Tool	Breakdown	Total Points (1000)
<u>Online:</u>		
Paper Presentation	One per student (individual work)	50
Taxonomic Prep	One per student (work in pairs)	50
Literature Notebook	Per assigned paper	100
Discussion Boards	As assigned	120
Quizzes	2 Quizzes X 40 pts	80
<u>In Hawaii:</u>		
Field Notebook	Daily entries (in Hawaii)	150
Class Project	6 analyses X 25 pts	150
Field Labs	4 labs X 50 pts	200
Participation	Academic X 50 pts Logistical X 50 pts	100

Grading Scale:

93-100%	A	80-82	B-	68-69	D+
90-92	A-	78-79	C+	63-67	D
88-89	B+	73-77	C	60-62	D-
83-87	B	70-71	C-	<60	F

Academic Honesty: <http://studentlife.oregonstate.edu/studentconduct/offenses-0>

Honesty is essential in all academic endeavors. A scientist must recognize what he/she has done and what was done by others. When ideas or data are borrowed from another source, that source must be cited whether it is a published scientific paper or another student. Much of the work in this course is collaborative but all assignments must be completed individually. Avoid plagiarism by completing all written assignments independently and by scrupulously giving credit to your sources. Students found plagiarizing their reports (by directly copying the work of other students or assigned reading material)

will receive a zero for that assignment. Repeated offenses will result in an F for the class. If you are uncertain about how or when to use work completed by others ask me for clarification prior to turning in assignments.

Students with Disabilities:

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

<http://ds.oregonstate.edu/facultyguidelines#before>