

SPECIAL TOPICS IN MARINE BIOLOGY
(MARS 6920)
Marine Megavertebrate Ecology & Conservation

HAWAII PACIFIC UNIVERSITY
OCEANIC INSTITUTE (OI)
SPRING SEMESTER, 2008

TIME: -----13.15 – 14:35
DAY: ----- Monday / Wednesday
ROOM: ----- OI

INSTRUCTOR

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OFFICE HOURS

@ OI: M, W 14:35 - 15:00
@ HL: Tu, Th 11:00 - 12.30
Other times as available, or by appointment

Text

There is no text book for this course. We will read papers from the literature and chapters from various ecology and conservation books.

Scope

Marine Science 6920 is a new course for advanced undergraduates and starting graduate students in ecology and marine science. This is a lecture and discussion course, designed to provide an overview of the ecology and behavior of large marine vertebrates, including bony fishes, sharks, sea turtles, seabirds, and marine mammals. This course will explore the response of these predators to oceanographic variability, their role in oceanic food webs, and the challenges associated with their management and conservation.

This course focuses on the importance of critically reading the original scientific literature, evaluating and synthesizing conflicting results and presenting information via oral and written using the standard scientific format. Science is a public enterprise; if you cannot effectively communicate your results to your colleagues and the public, you will be unable to make scientific contributions. Effective scientific writing not only requires good grammar and use of the scientific writing format, but the ability to find and comprehend published manuscripts by other scientists.

We will discuss papers from the original ecological literature (journal articles) and will examine their assumptions, contrast their conclusions and management implications, and evaluate how different results and perspectives can be reconciled.

We will also review management plans for endangered species and will debate how to address their effective conservation. Because we will explore unresolved issues, often there will not be a single answer or a best way forward. In these cases, we will discuss what types of information we would need as managers to answer these pressing questions and what would be the most efficient way to proceed, given the uncertainties we are faced with. This is the way science often has to proceed, and the way contrasting results and management recommendations are reconciled.

Student Learning Outcomes: By the end of this course students are expected to:

- Critically read and relate information verbally from papers published in the scientific literature. In a scientific seminar environment students will verbally present assigned papers to the class with the assumption that the audience is not familiar with the material. Presentations will include a synopsis of background materials, descriptions of methods, explanation and critical analysis of results, and synopsis and critical analysis of conclusions.
- Critically discuss assigned papers from the scientific literature. Following seminar presentations of papers the class will discuss the appropriateness of methods, data analysis, data presentation, conclusions, and management implications of the research.
- Use basic ecological principals taught in the class to interpret and explain patterns of species distributions. These skills will be evaluated with a homework set and a “knowledge” exam.
- Perform simple demographic analyses, using Leslie Matrix methods and interpret the results of these analyses. These skills will be evaluated using a homework set and a “knowledge” exam.
- Find and use published information from a variety of printed and electronic sources. This skill will be evaluated with a take-home final exam.
- Students will be able to evaluate published scientific information concerning the distribution and status of populations and the impacts/threats affecting them. These skills will be evaluated with a take home exam, an oral presentation and a question/answer session at a mock scientific panel.

Academic Honesty

Directly quoting others, even with proper attribution of the source, is almost never done in scientific writing, so **there are no circumstances in which including someone else’s writing in your papers will be acceptable in this course.** Particularly, it is academically dishonest to **plagiarize**: to try to pass off someone else's intellectual work as your own. Any single occurrence of academic dishonesty in any form whatsoever may result in a grade of FD for the course. The grade of FD represents an F for academic dishonesty and it will remain a permanent part of your academic record, not subject to HPU’s normal retake policy. Students are expected to comply with HPU’s academic honesty policies. All major writing assignments will be analyzed at Turnitin.com. For homework problems and any other take-home assignment, students may work with each other but must turn in their own answers to assigned problems. For additional information on plagiarism see the links in Campus Pipeline under the Libraries folder. Another excellent site explaining plagiarism (and how to avoid committing it) can be found at the Purdue University’s Online Writing Lab at: http://owl.english.purdue.edu/handouts/research/r_plagiar.html

GRADING: Grades are based on the following criteria:

Homework	10%	(Hw1: Demography, Hw2: Albatross Petition)
Discussions	10%	(Group discussions, Class participation)
Mid-term Exam	20%	
Debates	10%	
Oral Presentations	20%	(Speaker evaluations, Proposal presentation / Panel)
Research Proposal	20%	(Written proposal)
Take-home Final	10%	

Note: You must select a proposal topic different from your senior seminar course or ecology lab paper.

Total points: 100

90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
>60%	F

Note: I will use a system of plusses and minuses to fill in the gaps.

Participation points will be evaluated on the basis of your effort and commitment to learning. Evidence of this includes promptness and attendance in class, participating in discussions (and showing evidence of having carefully done the assigned reading) and seeking extra help when needed. You are expected to read any assigned chapters from your laboratory textbook and/or assigned papers prior to coming to class. Failure to do so may lead to some of your participation points being docked.

Absence due to documented medical emergencies (showing a note from your physician indicating that you are too ill to attend classes) will be partially (no points for participation) excused if you complete a make-up assignment (normally a 4-6 page paper). Students with more than three absences, documented or undocumented, will be dropped from the course.

Written Assignments and Presentations.

You will turn in:

- 1) A demographic analysis homework set (individual)
- 2) An albatross petition homework set (individual)
- 3) Evaluations of guest lecturers (individual)
- 4) Research Proposal (individual)
- 5) Take-home write-up (individual)

You will also give the following presentations:

- 1) Two debates discussing assigned papers from the primary literature (group project)
- 2) A research proposal on a topic of your choice (individual project)

Carefully use the *Instructions for Written Projects*, below -- this gives specifications for the 3 papers. My criteria for evaluating your papers include, but are not limited to: Appropriate structure for a scientific paper, originality of the research questions, clear statement of questions (hypotheses and predictions), use of reference material, clarity of presentation, grammar and spelling. In most cases late papers will not be accepted. In rare instances in which they are accepted, there will be a 10% deduction for each day they are late. Computer crashes are no excuse for not turning in papers on time. Back up your data each time you add to or modify your paper!

Analysis and Discussion of Papers from the Literature

Each day that we discuss scientific papers the class will be split into three groups: One group will introduce the paper, one will criticize it, and the third will support it against this criticism.

The introduction should take about 25 minutes, and should concisely state: 1) why the study was initiated, 2) what hypotheses were being evaluated, 3) how those hypotheses were tested, 4) what was learned (the results), and 5) how the results met with expectations, how they compare to the results from other studies, and how are they significant to the field of ecology. You should have all of these questions answered in your notebook prior to class.

STUDENTS INTRODUCING THE PAPERS WILL NOT BE ALLOWED TO REFER TO THE TEXT OF THE PAPER. YOU CAN ONLY USE NOTES (typed or handwritten) AND FIGURES AND TABLES FROM THE PAPERS.

After the synopsis, the "critic" group will provide comments on the paper. For example: Were there any problems with the methods used? Are the results accurately and properly presented? Do the results support the conclusions? Was the proper format followed for writing a scientific paper? The "supporter" group will then answer these criticisms and defend the authors.

An hour and a half is not enough time to thoroughly read all the assigned material, so it's crucial that you read the papers in advance of the class meetings. You will be given a "C" in participation for showing up and going through the motions. To earn a "B" or an "A" you will have to make significant contributions to the discussions.

Scientific Debates

Each day that we discuss scientific papers the class will be split into two groups, taking opposing stances on either side of a management dispute. The groups will be assigned to one side of the argument randomly at the beginning of the class. The 80-minute debate will follow the following format:

- Introductions (Team A and B): 10 mins for each team
- Rebuttal (Team A and B): 10 mins for each team
- Questions (Team A and B): 10 mins for each team
- Concluding Statements (Team A): 10 mins for each team

THE STUDENTS WILL BE ALLOWED TO REFER TO THE TEXT OF THE PAPER.

Because an hour and a half is not enough time to thoroughly read all the assigned material, it is crucial that you read the papers in advance of the class meetings. These are team activities (2 groups of three students), so make sure you organize yourselves so each person takes one job: intro / questions / concluding remarks. You will be given a "C" in participation for showing up and going through the motions. To earn a "B" or an "A" you will have to make significant contributions to the discussions.

Research Proposal

The *minimum* acceptable section lengths are:

justification	500 words.	Must address research needs and end with null / alternate hypotheses Contains at least 6 citations (4 of which are not in discussion)
objectives	200 words.	In bullet form, list objectives and products of the proposed research (i.e., for each activity, list the project output and contribution)
methods	500 words.	Be sure to include enough details to allow anyone to re-do the work
results	500 words.	Describe criteria used to evaluate results. No limit on figures / tables
contributions	500 words.	Discuss anticipated results and their broader management implications Contains at least 8 citations (6 of which are not cited in introduction)

Instructions for Written Reports / Papers

- Must include a cover page, typed double spaced, with 1 inch top margins, 1.25 inch side margins. Use standard 12-point font. Use sections listed above and provide word count for each section.
- Papers are late if they are not turned in both via email (word file) and in hard-copy (either stapled or in a binder) prior to class. A copy will be submitted to Turnitin.com, a plagiarism detection service.
- Avoid excessive verbiage! 1000 words of fluff are worth **less** than 500 words of concise exposition.
- There will be a 1 point deduction for each typographical error. Proofread your work carefully!
- **Note:** For reference, submit a copy of the first page of every paper cited.
- Acceptable Citation Format:

Grassle JF, Morse-Porteous LS (1987) Macrofaunal colonization of disturbed deep-sea benthic communities. *Deep-Sea Res* 34: 1911-1950

Josselyn MN, Cailliet GM, Niesen TM, Cowen R, Hurley AC, Connor J, and Hawes S (1983) Composition, export and faunal utilization of drift vegetation in the Salt River submarine canyon. *Estuarine, Coastal and Shelf Sciences* 17: 447-465

Kemp PF (1986) Direct uptake of detrital carbon by the deposit-feeding polychaete *Euzonus mucronata* (Treadwell). *J Exp Mar Biol Ecol* 99: 49-61

- In-text citations:
Single author: (Kemp 1986); Two authors: (Grassle and Morse-Porteous 1987);
More than two authors: (Josselyn et al. 1983)

Research Proposal Presentations

Presentations will take place during the last week of the course (before final's week). They must include a PowerPoint presentation and will last up to 12 minutes (10 for presentation + 2 for questions / answers). Students are to select a management question and devise a research program to address it. Background information must be presented to explain why the question is of interest and to give the current state of knowledge on the issue. Detailed research methods, justification for those methods, and methods of analysis must also be given. At the end of the period students will vote on the best proposal.

Tentative Schedule

- 1/23 Lecture: Introduction to the Class
1/28 Lecture: Living in the Sea
1/30 Lecture: Physiological Adaptations of Marine Vertebrates
2/4 Lecture: Sensory Biology of Marine Vertebrates
2/6 Lecture: Life-History Constraints
2/11 Lecture: Species Distributions I - Pelagic Biogeography
2/13 Lecture: Species Distributions II - Oceanographic Habitats
- 2/18 ***HOLIDAY: Presidents' Day***
- 2/20 Lecture: Anthropogenic Threats
2/25 Lecture: Living in the slow lane - Modeling for Conservation
2/27 Lecture: Managing exploitation - the International Whaling Commission
3/3 Lecture: Food Web Links
3/5 Lecture: Responses to Climatic Variability
- 3/10 Lecture and Group Discussion: Marine Protected Areas**
3/12 Lecture and Group Discussion: Dolphin-Safe Tuna
- 3/17 **Debate 1:** Compensatory Mortality
3/19 **Debate 2:** Depletion of Tuna Stocks
- 3/23 – 3/30 *Spring Break***
3/28 Homework 1 Due (via email)
- 3/31 Review Lecture
4/2 **Exam of Background Knowledge**
- 4/7 Homework 2 Due**
4/7 Guest Lecture: Monk Seals 1 – DLNR * **Student evaluation**
4/9 Guest Lecture: Monk Seals 2 – NOAA * **Student evaluation**
- 4/14 Guest Lecture: Fisheries Bycatch Mitigation * **Student evaluation**
4/16 Group Discussion: Fisheries Bycatch Case Study (**readings TBA**)
4/16 **Progress Report on Research Paper Due**
- 4/21 Guest Lecture: Tuna and Shark Movements and Behavior * **Student evaluation**
4/23 Group Discussion: Predatory Fish Behavior (**readings TBA**)
4/23 **Research Papers Due**
- 4/28 Student Presentations
4/30 Review Panel and Conclusions
4/30 Pick up Take Home (Due 5/7)

There will be no meeting during Finals Week.

Tentative Readings

(Read these materials before class meetings)

- 1/28 Review Basic Concepts of Light / Sound / Temperature in Sea Water
- 1/30 Steele 1985, Myers and Ottensmeyer 2005
- 2/4 Strathmann 1990, Hamner 1995
- 2/6 Costa 1991, Wilson et al. 1992
- 2/11 Fager & McGowan 1963, Brodeur et al. 1999
- 2/13 Hyrenbach et al. 2006, Polovina et al. 2004
- 2/20 Safina 1993, Polovina et al. 2001
- 2/25 Heppell et al. 2005, Clinton and Le Boeuf 1993
- 2/27 Gerber et al. 2005, Morishita 2006 + Clapham et al. 2007
- 3/3 Nowlis and Friedlander 2005, Filkenstein et al. 2006
- 3/5 Fields et al. 1993, Baker et al. 2007
- 3/10 Boersma and Parrish 1999, Alpine and Hobday 2007
- 3/12 Hall 1998, Norris and Hall 2002
- 3/17 Donlan and Wilcox 2007, Doak et al. 2007, Priddle 2007, Wilcox and Donlan 2007a, b
- 3/19 Myers and Worm 2003, Hampton et al. 2005, Myers et al. 2005
- 4/7 TBD by guest speaker
- 4/9 TBD by guest speaker
- 4/14 TBD by guest speaker
- 4/16 TBD by guest speaker
- 4/21 TBD by guest speaker
- 4/23 TBD by guest speaker
- 4/30 Dallmeyer 2005, Norse 2005

Note: Reserve copies of this book will be available at the Atherton Library

Marine conservation biology : the science of maintaining the sea's biodiversity /
edited by Elliott A. Norse and Larry B. Crowder ; foreword by Michael E. Soule.

Reference List

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