

Syllabus

CSUF Biology 317

Field Marine Biology

Spring, 2009 Schedule # 18834 (&18835)

Lecture MH217: W 1:00-2:50

Lab Scheduled Field Site or MH217: F 12:00-5:50

Prof.: Douglas J. Eernisse

Phone: 278-3749 (x 3749)

Email: deernisse@fullerton.edu

Office: MH217C (enter MH207 after calling x3749 outside door)

Office Hrs.: T 2:00-5:00 p.m. W 3:00-4:00 p.m.

Course Web Home Page: <http://biology.fullerton.edu/biol317>

(We will not use the course Blackboard site except as announced)

Prerequisites: Completion of the lower-division core (Biol. 171, 172, 273, 274) or equivalent courses with a passing grade or permission of the instructor. Prerequisites will be checked and enrolled students lacking them could be administratively dropped. You are responsible for providing documentation to Prof. Eernisse if you have taken the equivalent of these courses at another institution. This course is most appropriate for Biology majors who are either seeking a “kick-off” course that will lead into 400-level courses related to marine biology (419, 419L, 422, 446, 461, 475) or those who wish to take a single marine biology field course. It might not be appropriate for those who have already taken one or more of these 400-level courses related to marine biology.

Objectives: To gain appreciation and familiarity with the field biology and natural history of local marine plants and animals and the scientific basis for their study. Emphasis will be on the identification of common species and the factors determining their distribution and abundance in marine habitats. Also emphasized are the real and potential effects of human activities on marine organisms.

Required Materials: The textbook, *Marine Life and the Sea* (David H. Milne) and *Beachcomber's Guide to Seashore Life of California* (J. Duane Sept) are required. The latter is back-ordered by is expected soon in the Titan Shops bookstore. *Between Pacific Tides* (Edward F. Ricketts et al., 6th or any older edition) is an excellent book and is highly recommended. There are several other guides that are also recommended, and these are best found in used bookstores, at amazon.com, or on eBay.com, and selected recommended titles are provided later in this syllabus. Additional reading could be provided as handouts. Electronic projects might need to be turned in on a flash or zip disk or burned to a CD-R. It is required that you purchase a sturdy and reasonably waterproof notebook suitable as a field journal. A hand lens is extremely helpful. A camera is also highly recommended but please be advised that it could get splashed with seawater or dropped in a tidepool if you are not extremely careful. You will **REQUIRED** to purchase footwear and clothing suitable for rocky intertidal beachwear. This includes purchase of rugged wetsuit booties or other equivalent footwear. I prefer Merrill water shoes. Sandals such as Tevas are OK if you are used to wearing them in outdoor conditions. Any sandals that do not

strap down to your feet or that lack decent non-slip treads are dangerous and will not be allowed. If you show up with inappropriate footwear when we are scheduled to visit the intertidal I will not allow you to join us for the trip until you return with acceptable footwear. You will be expected to get your feet wet every intertidal trip. There is one optional opportunity to go snorkeling when we visit Wrigley Marine Institute on Catalina Island. Of the several options to rent gear, the most convenient and inexpensive option is to do so at Wrigley after we arrive. For this trip or the earlier boat trip on Feb. 13th off San Pedro, you are not allowed to wear open-toed sandals (including Tevas) while on the boat. The boat captain will likely ask you to stay on the dock if you do not have appropriate footwear. There is one required overnight field trip on the March 5 weekend that will necessitate bringing a warm sleeping bag and other camping gear, and some food for sharing in a class potluck. I anticipate at least one optional overnight non-camping fieldtrip to Landels-Hill Big Creek Reserve south of Big Sur (Monterey Co.), as listed on the class schedule. If you choose to attend such a trip you will need to bring appropriate intertidal and hiking gear as well as some cash to help cover group food expenses.

Evaluation Mechanisms: Your final grade will be based on approximately the following distribution of points, adjusted somewhat depending on the number of quizzes and field trip write-ups required:

Assignment	Points
Field Trip Write-ups; Evidence for Regular Note-taking in Field Journal	150 pts
Project Oral Presentations (Mini and Final)	50 pts
Web Assignment 1 and Other Brief Organism Written Assignments	30 pts
Final Organism Electronic Project	50 pts
Attendance/Regular 5 pt Quizzes	100 pts
Two Lab/Field Exams: Identification of Marine Organisms (50 pts. each)	100 pts
Three Lecture Exams (100 pts. each)	300 pts
Total	780 pts

Assessment of field Journal and other written assignments will be based on rubrics, distributed in advance, or guidelines discussed in class. You should especially strive to incorporate suggestions for improvement into subsequent write-ups. The “lecture and activities” part of the course is more precisely a combination of lecture and discussion activities. It is largely independent of the field component and is heavily focused on the material covered in the primary text by Milne. Expect to read most of this text during this semester. In particular, it is crucial that you come to class having studied the material scheduled for discussion that week. Regular weekly quizzes are intended to help provide incentive for you to do so. Like the exam questions, they will be based on questions similar to those “review questions” (“RQs”) provided on a course web page corresponding to each assigned text chapter, and these web pages are linked to the lecture schedule posted on-line: <http://biology.fullerton.edu/biol317/lecture.html> Consider these review questions to also be your best study guide for the mid-term exams. I generally do not give you additional study guides because this would require more work for you and would dilute my emphasis on these RQs. Because we meet for “lecture and activities” only once each week, attendance is very important and will be recorded. Those missing class regularly without a valid medical excuse will not only lose quiz points but can also lose attendance points. No make-up quizzes will be given. The points for quizzes and attendance will account for approximately 25% of the “lecture” points possible, with the remaining 75% divided equally among three non-cumulative midterms.

The most effective way to do well on the lab portion of the course are to be actively engaged on field trips and to turn in thoughtful and complete field trip write-ups. In general, each field trip write up will be turned in at the beginning of the next field trip, unless otherwise announced. You will be encouraged to take as many notes as possible in an appropriate field journal while in the field, but consider this your first draft. Your write-up will normally be a more polished written report. However, we would love to have you include any original or photocopied sketches that you complete in the field as figures in your report. Photographic images from our field trips are also encouraged but should be accompanied by an informative legend. You will be given a preliminary guide to expectations for these write-ups during the first lecture and additional rubrics as the semester progresses. The assessment of field trip write-ups will be based on how well you are observing physical and biotic factors important to the particular marine organisms we see first-hand in the field, and how effectively you are able to compare and contrast the sites we visit. We want to see evidence that you are improving your observational skills while in the field. We will not reward write-ups that strictly emphasize post-field trip research, although a certain amount of the latter will certainly help you to learn the plants and animals we expect to see. I will also be assigning a “specialty” group to individual or pairs of students early in the semester. You will be expected to give a “mini” (5 minute) oral presentation to the class on April 10, and a final (but still informal) presentation during one of our last two field trips, May 8 or 15. These oral presentations will be related to a final written “electronic” assignment in the form of a web page on your specialty group, due no later than May 18, unless otherwise announced. The lab component of the course will also emphasize learning to recognize, by sight, specific animals and plants that we see on required field trips. These skills will be assessed with two “lab practicum” exams, as on the schedule. In general, we encourage you to learn the Latin genus and species scientific names but “official” common names are acceptable alternatives. In order to qualify as “official” a common name should be listed on a hand out from me or be found in the “Beachcomber’s Guide” or another legitimate text, such as those recommended books listed near the end of this syllabus.

Grades:

This course will use a +/- grading scale. Please note that the Department of Biological Science requires a “C” or better grade (not “C-”) for any Biology course satisfying requirements for graduation. The following +/- grading scale will be used in this course:

A	92-100	C	69-71
A-	88-91	C-	66-68
B+	85-87	D+	60-65
B	80-85	D	55-59
B-	77-79	F	0-54
C+	72-76		

These cut-off levels are based on my experience in how students perform in this particular class and they will never be raised but they might be lowered in your favor. Lowering the cut-off scores on the point distributions in the class would depend on my own assessment of how the final scores reflect the overall performance of students in the class. In general, I prefer to adjust individual exams instead of the final cut-off scores if I find that the exam was more difficult than intend it to be.

Required Attendance to Field Trips:

You are expected to complete each of the scheduled field trips. In addition, some field trips require extra time spent out of the normal course meeting times, especially the single required overnight field trip (Friday March 6 to Saturday March 7) to the Kenneth Norris Rancho Marino Ecological Reserve in the Cambria area (San Mateo Co.). There is also a tentatively scheduled required all-day Saturday trip to Wrigley Marine Institute on Catalina Id. The Catalina Island trip is normally scheduled for a Saturday because, from experience, I have found that fewer students have conflicts than they would if we scheduled the trip for all day Friday. If you need a letter from me for the required weekend field trips (Cambria) or the Catalina Id. trip, in order to convince your boss that this is a legitimate excuse to miss or reschedule work, I am happy to do so, but please give me at least a week's advance notice before you need it. There is also a possible optional camping trip planned to the Landels-Hill Big Creek Reserve near Big Sur over the first part of Spring Break (Saturday March 28 to W April 1). Attending this trip, if it does occur, will certainly add to your enjoyment of this course but this is strictly an "optional" trip with no "extra credit" points attached. Allow approximately eight hours driving time each way. Work done during field trips is extremely difficult to make up and alternative assignments will be made only for the case of documented emergencies. Unexcused absences from field trips will result in the deduction of 25 pts per trip and will adversely affect your final grade. You will be responsible for getting to the announced field trip locations, which will often be between Palos Verdes and Dana Pt. but see schedule for exceptions. There will be one University vehicle (usually a white van or a white Ford Expedition) available for many of the trips, including those to destinations nearby in Orange Co., but you must arrange this in advance with me and you must be prompt, in order for the rest of us to arrive on time at the field trip destination. In general, rides should be arranged by Wednesday if you expect to go with me in the University vehicle. Your help in providing carpool transportation with your vehicle will be encouraged and appreciated. Cell phones are extremely helpful so that no one gets lost but should be turned off once we are in the field. I plan to compile a list of names and contact info for distribution to students; please let me know if you do not want me to share such information. You will be required to sign a fieldtrip waiver form before you can participate in the fieldtrips for this course (available first day). Note that, due to early low tides on certain field trips, it would be ideal if you could make it to such field trip sites by noon although we understand that you cannot leave campus until noon if you have a class until 11:50.

Email and Phone Logistics:

Due to the increase in SPAM email, please ALWAYS put "BIOL317" or something similar in the subject of your email. Also, please remember to end your email with your name and current email address. It is my policy to respond to email questions or comments that meet these criteria within 48 hours. Under most circumstances, I will reply even sooner. Alternatively, feel free to call my office at extension 3749. I depend heavily on having you check your email, especially on Friday mornings before field trips, in order to update you about last minute details. Please make sure that I know the best way to get in touch with you. If you are not very good about checking your email and would rather have me call you on your cell phone, please let me know this. I am not very good about calling cell phones but I might do this if there is an urgent need to contact you. If you do not want me to distribute some of your contact information, please let me know which contact info is or is not OK to distribute. In this course, it really is valuable to be able to contact each other. In the event of inclement weather that might force us to change field

trip details, I need to be able to contact each of you by email, most likely by late Thursday night. If weather conditions are questionable, please check your email Friday a.m.

Office Hour Logistics:

Many students are confused on their first to my office. In order to get to my office (MH217C) you must first gain access to the outside door (MH207) by calling me on the campus phone (extension 3749) just outside that door. I will announce office hours because I still do not know when I will need to meet for regular lab group and Departmental committee meetings.

Adds/Drops:

Important dates concerning registration or drops are on the inside cover of the CSUF Class Schedule. You can add (if course is not full) or drop the class without penalty through Titan registration during the first week of classes. Adding the course during the second week requires a department issued registration permit from the Biology office (MH282). Because of the anticipated high demand for this course, I will be unlikely to grant instructor permission after the first week and will be likely to administratively drop students who do not show up to the first class meeting. CSUF has a policy (UPS 300.016) regarding withdrawal from classes. After the first census date, students may be granted withdrawal without receiving a "W" grade only by presentation of documentation outlining a physical, medical or emotional condition that prevents completion of the course. Poor academic performance is not evidence of a serious reason for withdrawal. Students unable to produce official documentation will be required to take the grade they have earned in the class.

Accommodations for Special Needs:

Students with documented learning disabilities should make me aware of the need for accommodations. I will work with you to ensure that you have the best possible learning experience.

Extra Credit:

There will be an opportunity to earn up to 10 points extra credit for up to two activities. Activities will include selected Biology Department or other seminars, as announced in class or on the course home page under the announcements link. The Departmental Seminar schedule is linked from the Biology website or at: <http://biology.fullerton.edu/events/semS09.html> and starts the second week of classes in MH513, 4 p.m. to 5 p.m. There will also be other occasional seminars that will qualify for extra credit if so announced. Activities could also include seminars or presentations at other locations, as announced by me. If you find a potential activity that you feel will enhance your knowledge of marine biology, email or otherwise provide me with details in advance of the potential activity, or take a chance and do it and I may or may not approve it. In general, I will want you to provide a written account of the following: 1) What was the main take-home message of the presentation? 2) What questions do you have for the speaker or as a result of your experience? 3) How can you suggest extending the research or other activities presented? I will assign 0-5 points per activity, depending on the quality of your write-up.

Academic Integrity:

I assume that by remaining enrolled in this class your intentions are HONORABLE, and that you accept responsibility for dutiful attendance, earnest effort toward understanding the subject and pledge that you will not cheat on exams.

- Plagiarism is the unacknowledged use of another's words or ideas as your own. Use your own words when writing. Use quotation marks and cite the source of any phrase that you "use". Changing one or two words in a sentence is still plagiarism. You must put the information into your own words.
- Cheating is the use of another's work as your own. Copying another student's homework, looking at another student's exam, and using information from another student to enhance your performance on a task are all examples of cheating.

The only exception to these definitions is if I have specifically allowed you to work together to complete an assignment. For example, I generally encourage you to help each other compile a species listing, but I want you to write up each field trip report using your own words. Use online or library sources of information and work together but when you write your answers, your work must reflect your own independent thinking. When you use information from sources external to yourself, you need to reference the source appropriately (literature citation, URL for web-derived material). Repeating, just because you referenced a source does not give you the right to insert segments, verbatim, into papers you write.

Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. University policies are strictly enforced in this course. Please familiarize yourself with the academic integrity guidelines found in the current student handbook.

Texting, Facebooking, Ringing Cell Phones, Web Surfing:

Please! Not in class!

Classroom Safety Briefing:

- In the event of an emergency such as earthquake or fire:
 - Take all your personal belongings and leave the classroom (or lab). Use the stairways located at the east, west, or center of the building.
 - Do not use the elevator. They may not be working once the alarm sounds.
 - Go to the lawn area towards Nutwood Avenue. Stay with class members for further instruction.
 - For additional information on exits, fire alarms and telephones, **Building Evacuation Maps** are located near each elevator.
 - Anyone who may have difficulty evacuating the building, please see me after class.
- Dial 911 on any campus phone, pay phone, or blue emergency phones to connect directly to University Police. Dialing 911 on your cell phone will connect with the Highway Patrol. Tell CHP dispatcher that CSUF Police is the responding agency. Stay on the line until asked to hang up.
- If you want to bring visitors to the classroom, you must obtain permission from the instructor in advance and must sign a volunteer form.
- Visitors to the lab must obtain permission from the Chair and must sign a volunteer form.

- There is no smoking within 20 feet of every campus building. This includes the MH balcony and top of stairwells in SLC.
- **IN THE LAB:** Specific hazards or risks in the lab will be discussed prior to each experiment. If you have any questions about the safety of an experiment, please contact me (or the GA).
 - If there is a spill of a hazardous chemical, notify me (or your GA) immediately.
 - Report all injuries to me (or the GA) immediately.
 - All students must read and sign the departmental, “Laboratory Safety Procedures” form at the beginning of each semester.
- **FOR FIELD TRIPS:**
 - Make sure you submit an Academic Field Trip Waiver for the semester and sign the Participant List, which will be duplicated and resubmitted for each field trip. If emergency contact information changes, you must tell me in advance of a field trip so I can make appropriate changes.
 - Students must comply with all State laws regarding possession, sale and use of alcohol or controlled substances while participating in CSUF related activities.

Major Fields Test in Biology:

IF YOU ARE A SENIOR BIOLOGICAL SCIENCE MAJOR WHO IS PLANNING TO GRADUATE IN JUNE, AUGUST, or DECEMBER 2008/January 2010: You are required to take the Major Fields Test in Biology in order to graduate. There is no cost to you to take the exam, which is paid for by the Department of Biological Science. The exam can be signed up for in the Biology office but please sign up early so you can get the Thursday time that does not conflict with our Friday field trip. If you have not already signed up to take the exam please go to the Biology Office (MH 282) and sign up!

Texts:

Required

Milne, D.H. 1995. Marine life and the sea. Wadsworth Publ. Co., Belmont, CA 459 pp.

Sept, J.D. 2002. The Beachcomber’s Guide to Seashore Life of California. Harbour Publ.. Madeira Park, BC Canada (<http://www.harbourpublishing.com>), 312 pp. [Note: Be sure you are not buying a similar title by this author on “the Pacific Northwest”]

Recommended books (Keep an eye out for the following in used book stores):

- (Recommended) Ricketts, E.F., Calvin, J., and Hedgpeth, J.W., revised by Phillips, D.W. 1985. *Between Pacific tides*, 5th Ed. Stanford University Press, Stanford, CA, 652 pp.
- (Recommended) Denny, M. W., and S. D. Gaines (Eds.) 2007. *Encyclopedia of Tidepools and Rocky Shores*. Univ. of California Press, Berkeley, California.
- (Recommended) Carlton, J.T. (Ed.) 2007. *The Light and Smith Manual: Intertidal Invertebrates from Central California to Oregon*. Fourth Edition. Univ. of California Press, Berkeley, California.
- Abbott, I.A. and Hollenberg, G.H. 1976. *Marine algae of California*. Stanford University Press, California, 827 pp.
- Allen, R.K. 1976. *Common intertidal invertebrates of southern California*, Revised Edition. Peek Publications, Palo Alto, Calif. [Out-of-print; good keys]
- Carefoot, T. 1977. *Pacific Seashores: A guide to intertidal ecology*. Univ. Washington Press, Seattle, WA, 208 pp. [Out-of-print but highly recommended.]
- Dawson, E.Y. and Foster M.S. 1982. *Seashore plants of California*. California Natural History Guides: 47. University of California Press, Berkeley, CA, 226 pp.
- Farrand, J., jr. 1988. *Western birds*. McGraw-Hill, Co., New York, New York, 496 pp. (or any other field guide to West Coast/North American birds)
- Gotshall, D.W. 1994. *Guide to marine invertebrates. Alaska to Baja California*. Sea Challengers, Monterey, CA, 105 pp. (or their books on Baja fauna)
- Hinton, S. 1988. *Seashore life of southern California*, Revised Edition. University of California Press, Berkeley, CA, 256 pp.
- McLean, J.H. 1978. *Marine shells of southern California*. Natural History Museum of Los Angeles County, Science Series 24, Revised Edition, 104 pp. [out-of print but highly recommended guide for local molluscs]
- McConnaughey, B.H. and McConnaughey, E.M. 1985. *Pacific Coast*. National Audubon Society Nature Guides. Alfred A. Knopf, New York, New York, 633 pp. [The bookstore could not get enough of these for our course, so it is no longer required.]
- Miller, D.J. and Lea, R.N. 1972. *Guide to the coastal marine fishes of California*. State of California. Department of Fish and Game. California Fish Bulletin Number 157, 149 pp.
- Morris, R.H. 1980. *Intertidal invertebrates of California*. Stanford Univ. Press, Palo Alto, CA, 690 pp. [A classic; typically sells for over \$200 if you can find it.]
- National Geographic Society. 1987. *Field guide to the birds of North America*. Second edition. National Geographic Society, Washington, D.C., 464 pp.
- Niesen, T.M. 2000. *The Marine Biology Coloring Book*. 2nd Edition. HarperResource, New York. [Full of well-illustrated and described examples of marine ecological associations; older 1982 edition is good as well.]
- Reish, D.J. 1972. *Marine life of southern California*. Kendall/Hunt, Dubuque, IA, 164 pp. [out-of-print]
- Sibley, D.A. *The Sibley field guide to birds of western North America*. Alfred A Knopf, New York, 473 pp.
- Smith, R.I. and Carlton, J.T. 1975. *Light's manual: intertidal invertebrates of the central California coast*. 3rd Ed. University of California Press, Berkeley, CA, 721 pp. [This is still useful but has been replaced by the new 2007 Light and Smith Manual, 4th ed., see above.]
- Snyderman, M. 1998. *California marine life: An identification and field guide to common marine species*. Roberts Rinehart Publishers, Boulder, CO, 192 pp.

Tway, L.E. 1991. Tidepools of southern California: an illustrated guide to where they are. Capra Press, Santa Barbara, CA, 176 pp. [Out-of-print so buy it if you find it – includes highly useful maps and site descriptions.]

Don't forget that there are also many excellent (and many bogus) on-line websites. I maintain a web page of "Links for the Study of Marine Biology" including a handy link to tide schedules:

http://biology.fullerton.edu/biol317/marine_bio.html

Lecture/Field Trip Schedules:

The official lecture and field trip (lab) schedules for this course are on-line as linked from the course website home page: <http://biology.fullerton.edu/biol317/>. These schedules will be maintained and updated when necessary. The schedules attached to this syllabus on the next pages are tentative schedules only and details are subject to update. The other reason to regularly check the on-line field trip schedule is that I have provided links to directions and other important information related to our field trips directly on the field trip schedule.



**Field Marine Biology
Biol. 317 - Prof. Eernisse
California State University, Fullerton
Spring, 2009**

Lecture: W 1-2:50 in MH217
 Lab (Field Trips): F 12-6 p.m. MH217 or [as announced](#)
 Schedule # 18834 (& 18835)
 Office Hours: Tues 2-5 p.m., Wed. 3-4 p.m.
 Office: MH217C (enter MH207 after calling x3749)

Provisional Lecture and Readings Outline
 Pages refer to [Marine Life and the Sea](#) (MLATS) by Milne

WEEK	DATE	LECTURE TOPIC	ASSIGNMENT
1	Jan 28	Course Intro Oceans of Planet Earth	(others as announced)
2	Feb 4	Oceans of Planet Earth (Web assignment 1 due)	pp. 1-21 Ch. 1
3	Feb 11	Ocean currents and tides	pp. 22-50 Ch. 2
4	Feb 18	Water, salt, temperature, & gases Uses of Underwater Light and Sound	pp. 51-79 Ch. 3 pp. 80-105 Ch. 4
5	Feb 25	Adaptations to the Weight and Density of Water	pp. 105-125 Ch. 5
6	Mar 4	Exam 1 (and planning for weekend field trip to central California)	Chapters 1-5
7	Mar 11	Small organisms and plants in the sea RQs 6.3. 6.6-6.11	pp. 129-152 Ch. 6
8	Mar 18	Animals without backbones RQs 7.1-7.6	pp. 153-184 Ch. 7
9	Mar 25	Fishes: hagfish, sharks, and salmon	pp. 185-207 Ch. 8
10	Mar 30 ->	Spring Break!	
11	Apr 8	Marine birds, mammals and turtles RQs 9.2-9.17 & Populations, communities, ecosystems RQs 10.3-10.8	pp. 208-238 Ch. 9 pp. 240-256 Ch. 10
12	Apr 15	Populations, communities, ecosystems RQs 10.9 -> Offshore communities & deep sea	pp. 240-256 Ch. 10 pp. 293-312 Ch. 13
13	Apr 22	Exam 2	Chapters 6-10, 13
14	Apr 29	Stability and change in communities	pp. 347-370 Ch. 15
15	May 6	Harvesting marine life & Long-term change in communities	pp. 419-434 Ch. 18 pp. 373-395 Ch. 16
16	May 13	Human impacts	pp. 400-416 Ch. 17
Finals	May 18	Exam 3 (Chs. 15-18 only; see here for some review notes) Last date to Turn in Assignments (or to MH282 by 5 p.m.)	MH217 2:30-4:20

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Last revised Jan. 28, 2009 - dje



Field Marine Biology
Biol. 317 - Prof. Eernisse
California State University, Fullerton
Spring, 2009 TENTATIVE
Lecture/Activity: W 1-2:50 MH217
Lab (Field Trips): F 12-6 p.m. As Scheduled or in MH217

Field Trip Schedule

WEEK	DATE	ACTIVITY	TIDES/TIME
1	Jan 30	Cabrillo Aquarium visit, and (weather dependent) Cabrillo Beach or White Pt. (map) or Royal Palms S.P. (map or map2) @ 13:00 - allow 1 hour travel time	17:22 / 0.64 ft
2	Feb 6	Intertidal Abalone Cove , Palos Verdes, Parking Lot @ 13:00 - allow 1 hour travel time - Directions Here Sat. Feb. 7 - Possible optional field trip (great low tides!)	13:30 / -1.29 ft
3	Feb 13	Black Abalone Day! <i>R/V Vantuna</i> Cruise off Long Beach (Meet 13:00 sharp @ SCMI, San Pedro Harbor ; boat leaves at 13:15 - satellite view)	17:29 / 0.89 ft
4	Feb 20	Dana Pt. Marine Life Refuge, Dana Point , Intertidal - Meet @ 14:30 near the <i>Pilgrim</i> (Ocean Institute has directions , this map and this webcam . USGS has this geological map in pdf format)	13:32 / -0.27 ft
5	Feb 27	In class activities, DBH248 at 12:00, then possible field trip TBA	16:15 / 0.60 ft
6	Mar 6	Rancho Marino Reserve (Overnight camping near Cambria - Special Time: Leave Friday 9 a.m., return Sat./Sun. evening) – Directions are here (Sa. and Su. tides based on Monterey, CA)	F: 13:03 / -0.79 ft Sa: 13:48 / -0.98 ft Su: 15:28 / -0.98 ft (San Simeon)
7	Mar 13	Meet at Noon, DBH 248 , for Lab Exam 1; then intertidal visit to Dana Pt. Marine Life Refuge, Dana Point , Intertidal - Meet @ 14:30 near the <i>Pilgrim</i> (Ocean Institute has directions , this map and this webcam . USGS has this geological map in pdf format)	17:13 / 0.89 ft
8	Mar 20	Intertidal Abalone Cove , Palos Verdes, Parking Lot @ 13:00 (or make arrangements to meet in intertidal) - allow 1 hour travel time - Directions Here	13:16 / 0.20 ft
9	Mar 27	Crystal Cove State Park Meet at Reef Pt. Parking Lot @ 13:00	16:12 / 0.79 ft
11	Mar 30->	Spring Break! (Optional Field Trip to Big Sur, March 28-April 1, TBA)	Sa: 11:59 / +0.5 ft Su: 12:57 / +0.3 ft Mo: 13:42 / +0.1 ft Tu: 14:20 / +0.1 ft
10	Apr 10	allow 1 hour travel time Bolsa Chica , Meet @ 13:00 (Guest Leader: Dr. Joel Weintraub - To Prepare See Links for Ch. 9) (Driving Directions ; Birder's Guide Species List)	16:05 / 1.17 ft
12	Apr 17	Project Mini-Presentations at Cabrillo Aquarium (1:15 p.m.)	11:22 / 0.56 ft
13	Apr 24	Upper Newport Bay - Ecol. Res. , kayaking – Directions @ 13:00 (no FT writeup)	15:05 / 1.16 ft
14	May 2 Sat.	Yellowfin to Wrigley Marine Sci. Ctr., Catalina Id. (Meet 7:00! Special Time Saturday @ San Pedro Harbor - satellite view) -- TRIP DATE IS UNCONFIRMED	10:14 / -0.30 ft
15	May 8	Crystal Cove State Park Meet at Reef Pt. Parking Lot @ 13:00; Brief update presentations on your progress for final project in the field @ ~ 14:30 (no FT writeup)	14:59 / 1.62 ft
16	May 15	San Onofre State Park (directions! - map - surfcam) - Meet at 8 a.m. if possible (no FT writeup)	09:00 / 0.43 ft
Finals	May 18	Final Exam and Final Date to Turn in Assignments (or in MH282 by 5 p.m.)	MH217 2:30-4:20