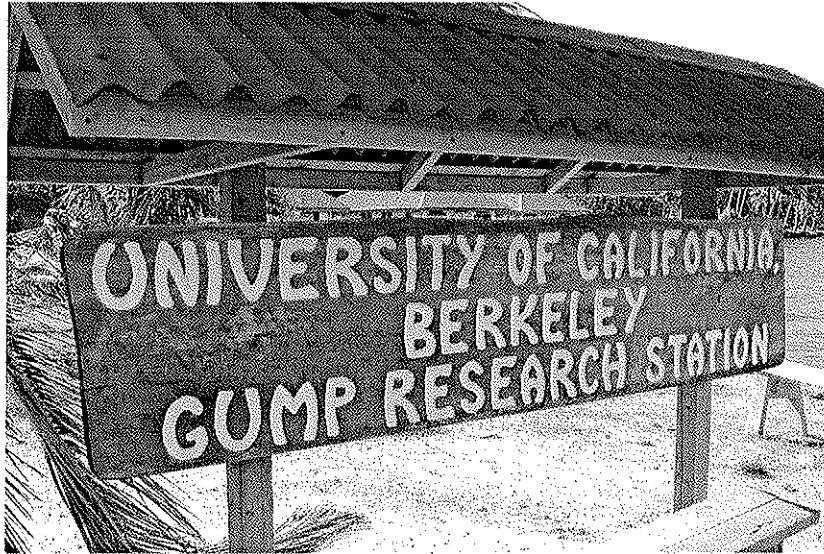


Biology and Geomorphology of Tropical Islands
ESPM C107 = IB C158



Syllabus—THIS IS AN EVOLVING DOCUMENT—PLEASE CHECK WEBSITE FREQUENTLY FOR UP-DATES AT <http://bSpace.berkeley.edu> .
THE KEY TO SUCCESS IS FLEXIBILITY!

Professors:

Jere Lipps (organizer), IB
 Jaime Bartolome, ESPM
 Roy Caldwell, IB
 Carole Hickman, IB
 Brent Mishler, IB
 Vincent Resh, ESPM

GSIs:

Liz Perotti, IB
 Alison Purcell, ESPM
 Erica Spotswood, ESPM

Gump Lab Management

Neil Davies, Executive Director
 Frank Murphy, General Manager

At UC Berkeley (28 Aug – 14 Sept.): LECTURES, WORKSHOPS, AND PREPARATION. WE WILL MEET FORMALLY EACH WEEKDAY, MORNINGS 9-12, IN 3059 VLSB. WE HAVE ONLY A SHORT TIME ON CAMPUS, AND THIS INTRODUCTORY MATERIAL IS VERY IMPORTANT, SO STUDENTS ARE EXPECTED TO ATTEND EACH CLASS, AND BE ON TIME (BEFORE 9:10 PLEASE) UNLESS NOTED. THE AFTERNOONS WILL BE USED FOR WORKSHOPS, LIBRARY WORK, AND THE LIKE. EACH MEETING IS IMPORTANT, SO WE EXPECT FULL ATTENDANCE. PLEASE CHECK THE WEBSITE DAILY FOR UPDATES: <http://bSpace.berkeley.edu> .

Aug 28: Introductions (Instructors, GSIs). Questions and answers from students and for students. Learn the general features of Tahiti/Moorea because we will have an oral “learning quiz” about the Society Islands, the Pacific Ocean, Tahiti, and Moorea.. Document check: passports, visas, tutorials, tickets, etc. Course and travel details. Introduction to Gump Station. (Lipps, Mishler, Resh, Bartolome). Project review from previous years, discuss what makes a good project, and suggest future potential topics (Instructors, GSIs).

Aug 29: Remainder of class fees due, **\$3,300**. Total you paid = \$3800.

Geology meets biology on tropical oceanic islands: tectonics, structural geology, geophysics, geomorphology, paleoceanography, climatology, reef structure, and reef evolution (Lipps)

PM: What to bring to Moorea. Cooking groups. Bodega weekend details, car pools, etc.

Aug 30: 9:10. Introduction to scientific thinking and communication in science (Mishler and Lipps).

10:15: Principles of phylogenetics & biogeography (Mishler).

PM: Workshop on taking notes for biological and geological field work (GSIs) Sampling equipment and quadrat construction.

Aug 31: Methods for characterizing and studying behavior. Opportunities for behavioral study on Mo`orea. Dangerous marine animals (Caldwell).

PM: 2:00–4:00: Introduction to library and resources (Norma Kobzina in BioSci Lib. Computer room on the left side as you enter the library on the 2d floor of VLSB).

Sept 1: Island freshwater biology, biogeography and evolution (Vince Resh, ESPM). Last minute update on Bodega field trip Saturday through Monday.

PM: Introduction to statistics and experimental design (Mishler, Bartolome)

Sept. 2-4: BODEGA BAY FIELD TRIP, BODEGA MARINE LAB. BE FLEXIBLE.

([HTTP://WWW.BML.UCDAVIS.EDU/](http://www.bml.ucdavis.edu/)), **3 DAYS, 2 NIGHTS. ALL EXPENSES EXCEPT CAR POOLING ARE PAID FOR—ROOM, BREAKFAST, LUNCH AND DINNER.**

Sept. 2 (Sat): 8:30 AM: LEAVE CAMPUS FROM PARKING LOT (DWINELLE LOT)

SOUTH OF VLSB. See map in classroom.

Morning: Biology and geology of the coast range cross-section (Lipps, Mishler, Bartolome). Stops at Marin Headlands, Lucas Valley Rd, Pillow Basalts, Tomales Bay overlooks.

Mid-afternoon: Lunch at Millerton Point, Tomales Bay.. Examination of local marsh, beaches, geology, paleontology. The tides will be high, and you will likely get wet below the knees. No waves or surge will be involved, so we can wade safely around Millerton Point to see everything. Wear shoes or booties that can stand getting wet but that will also give you secure footing. Flip-flops will cause you a lot of trouble on the rocks. We'll be there at low tide, but that is a very high-low tide. Head to Bodega Marine Lab via Walker Creek (stop for look at marsh), Tomales, Valley Ford (stop for look at headwaters of Estero Americano), and Bodega Bay.

TIDES

Low 1:18 AM 0.6

High 9:01 AM 3.9

Low 12:50 PM 3.7

High 6:35 PM 5.6

5:30 PM: Arrive at BML Dorms for room assignments and settling in.

6:00 PM: Dinner in dining hall.

Evening: Name recognition? Spider and insect hunt.

Sept. 3: AM: Breakfast at 9:00 AM. Tour of facilities and reserve. Hike to Mussel Point, view exposed rocky intertidal, examine exposed beach, and return to lab through the dune habitat past the pond (Hickman, Lipps, Mishler, Bartolome).

Lunch: make your lunch after breakfast and bring it to eat on the patio, the beach at the Lab, or on Mussel Point trail.

Afternoon: Terrestrial vegetation and field sampling (Bartolome).

Evening: Dinner at 6:00 PM. Discussion and data session (Bartolome, Hickman, Lipps, Mishler).



Sept. 4: AM: : Breakfast at 9:00 AM. Check out Horseshoe Cove for intertidal work. Are the tide, surge or waves too high for safety? If so, divert to beach or elsewhere for work there. Take notes on what you can see on the rocky intertidal.

Lunch: Bag lunch provided after breakfast. About noon after the morning field work, check out of your room by clearing and cleaning it, and giving the keys to Prof. Lipps in the dining hall. You can eat your lunch at the dorms or take it with you as you return to Campus at your leisure in the afternoon.

Lectures back in Berkeley as usual.

Sept. 5: 9:10 AM. Peopling of the Pacific. (Pat Kirsch)

PM: Plants of Moorea (including marine algae): systematics, evolution, and ecology (Mishler).

Sept. 6: Culture of Tahiti (Resh); A Brief History of French Polynesia (Lipps).

PM: Library research on Moorea and your own interests there.

6:00 – 9:00 PM: REQUIRED SNORKELING AND WATER SAFETY, SWIMMING TEST, RSF or Haas (Jim Hayward, UC Scientific Diving Officer)

Sept. 7: 9:45: GIS/GPS Workshop, 124 Mulford Hall (Guest: Maggi Kelly, ESPM)

PM: Workshop continues.

Sept. 8: Terrestrial evolutionary and ecological processes on islands – Colonization, equilibrium theory, species turnover, adaptive radiation (Hickman).

PM: Language workshop, French, Tahitian. (Purcell and Spotswood).

Sept. 11: Tree snail case study -- endemism, evolutionary radiations, introduced species, biological control, and ex-situ conservation plus the 55-minute BBC video and a discussion (Hickman)

PM: Museum resources workshop: collection, identification and preparation of voucher specimens I – Invertebrates (Hickman in UCMP, Guests: Pete Oboyski and Staff in Essig)

Sept. 12: Ethnobotany of Polynesia, (Guest: Thomas Carlson).
Research in Library on research topics.

Sept. 13: Invasive plants including grasses (Bartolome).

2 PM: Museum resources. Workshop: collection, identification and preparation of voucher specimens II - Plants (Mishler, Guest: Herbarium Staff).

4 PM: Dune projects due, email to: mishler@berkeley.edu in Word or PDF format.

Sept. 14: *Exam on lecture & workshop material*, 9:10-12, open book, open library.

PM: Packing group items, pick up your carry along items, leave for LA, if you wish.

Sept. 15 – Sept 17: TRAVEL DAYS TO MOOREA. NO INSTRUCTION. YOU MUST ARRANGE YOUR OWN TRAVEL TO ARRIVE AND CHECK IN TO THE GUMP STATION ON MOOREA BY 5 PM, SEPT. 17.

17 Sept. – 19 Nov. MOOREA, FRENCH POLYNESIA. FIELD INSTRUCTION AND INDIVIDUAL RESEARCH PROJECTS.

Sept. 16 and 17: Arrive at Gump Station, Moorea; Meals can be prepared by individuals or food groups as follows: 16 Sept. dinner; 17 Sept. Breakfast & Lunch. Welcome BBQ at Gump House (up the hill across from the dorms) on Sunday, 17 Sept. It will begin at 6 PM and you must be there.

Week 1 (18-23 Sept.): Field trips, Moorea and Tahiti. Class exercises begin. Evening lectures/discussions. (Bartolome, Lipps, Mishler).

Sept. 18: Briefing on Lab, Safety Issues, etc (Davies and Murphy, Gump Sta.).

Circum-Island Trip and Introduction to environments—Belvedere, coastal habitats, mangroves, muddy lagoon, patch reefs, barrier reef, human impacts, view to Tahiti with discussion of hot spot island formation, freshwater streams, invasive plants, trees of Moorea, Polynesian temples and terraces. (Bartolome, Lipps, Mishler).

Sept. 19: Motus. Formation, geology and geomorphology of barrier reef islands (motus), motu/strand vegetation in extreme environments, motu marine fauna and flora, marine biology of lagoon, Polynesian use of motus in the past. (Bartolome, Lipps, Mishler, Murphy)

Sept. 20: Stream transect at Afariatu. Sample the stream from its outflow into the lagoon upstream to the cascade. Count fish, gastropods, shrimp, etc., for later statistical analyses (but not to be written up); Plant communities and habitats along transect.

Sept. 21: 6 am: Reef transect at Tamae and microbial mats at Tamae.

Afternoon: Transect of vegetation and associated animals from the marae to the Belvedere.

Sept. 22: Cross island trek (Vaiare-Paopao) to examine uplands vegetation and arthropods.

Week 2 (Sept. 24-30): Short visits to Mari Mari's. Pilot projects underway. Proposals due at end of week. Individual meetings with teaching staff to evaluate proposal. (Bartolome, Lipps, Mishler).

Sept. 25: AM: Marine sampling and identification of marine invertebrates, algae, seagrass, and zooplankton, Gump Reef. Introduction to some sampling techniques (plankton tows, defaunation of marine algae, etc.)

PM: Work on developing your project.

Sept. 26: All day: Discuss and consult on research ideas informally with staff. Work in field or on logistics of your proposed project.

Sept. 27: Field work on project. Consult with staff, if desired.

Sept. 28: Project development.

Sept. 29: FIRST PROJECT PROPOSAL DUE ON OR BEFORE 5 PM. ALSO, SIGN UP BY 6PM IN DORMS FOR AN APPOINTMENT ON SATURDAY SEPT 30 TO REVIEW YOUR PROJECT PROPOSAL WITH THE FACULTY AND GSIs. YOU MUST GET APPROVAL TO CONTINUE YOUR PROJECT.

Sept 30 (Sat): PRESENT PROJECT IDEAS INDIVIDUALLY TO FACULTY AT APPOINTED TIME (SEE SIGN UP SHEET IN DORMS THAT YOU SIGNED IN ON LAST NIGHT). (Note Mishler leaves today, so last chance to talk to him).

Week 3 (Oct. 2-6): Faculty and GSIs assist getting projects started. Pilot studies. Revised project proposal due. (Bartolome, Lipps). Short trip to French Station and Agricultural Research Station will be arranged in this week.

Oct. 2: Work on projects. Staff available for consultation at Lab.

Oct. 3: Work on projects. Staff available for field consultation.

Oct. 4: Work on projects. Staff available for consultation in the lab and field.

Oct. 5: Work on projects. Staff available for consultation in the lab and field.

Oct 6: REVISED PROJECT PROPOSALS DUE AT 10AM. You can discuss your projects, if necessary with faculty and GSIs, who will be available at the Station either outside or in the labs/dorms.

Week 4 (Oct. 9-13): Projects, with assistance of GSIs and instructors. Emphasis on data to be collected and how it will be analyzed (Bartolome & Lipps will leave on Oct. 14)

~~**Week 5 (Oct. 16-20):** Projects, with assistance of GSIs and instructors; possible trip to Tetiaroa (Caldwell, Hickman arrive).~~

Week 6 (Oct. 23-27): Projects, with assistance of GSIs and instructors (Caldwell leaves at end of week, Hickman).

Week 7 (Oct. 30-Nov. 3): Projects, with assistance of GSIs and instructors. Begin to analyze data and writing drafts (Hickman).

Week 8 (Nov. 6-9; 10 is an academic holiday): Projects, with assistance of GSIs and instructors. Emphasis on data and writing; draft of introduction due (Hickman leaves at end of week, Resh arrives at first of week)

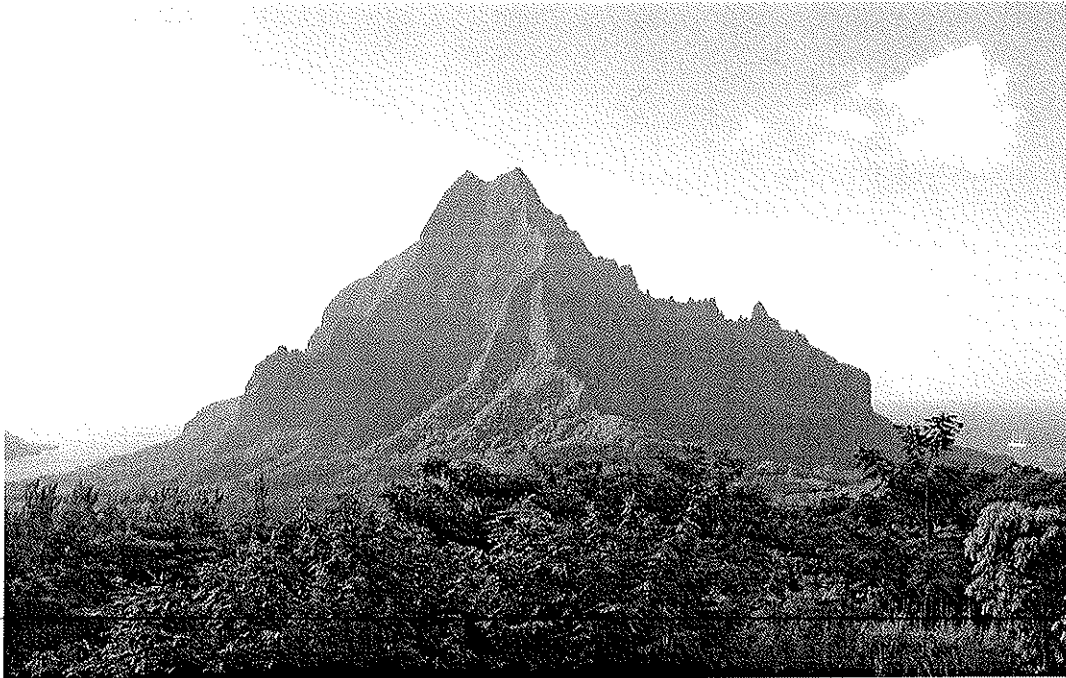
Week 9 (Nov. 13-17): Complete projects, organize research findings, work on preliminary drafts, final report outlines due (Resh). Clean rooms and prepare to leave Gump Station.

Nov. 13-16: Last chance to get more field data, collections and images; work up your drafts of your paper.

Nov. 17: Friday: Clean-up party for dorms and grounds; Formal Moorea component of the class ends. (Resh)

Nov. 18: Saturday. YOU MUST MOVE OUT OF STATION BY 12 NOON.

Nov. 18 – Nov. 27: FREE TIME TO EXPLORE OR RETURN FOR HOLIDAYS. NO INSTRUCTION. THIS TIME PERIOD IS NOT A COMPONENT OF THE CLASS, THOUGH WORK ON YOUR PROJECT PAPER IS ENCOURAGED. THANKSGIVING HOLIDAY IS 23-24 NOVEMBER.



At UC Berkeley (27 Nov – Semester end): PROJECT COMPLETION.

Nov. 27: Monday: REQUIRED CLASS MEETINGS BEGIN AGAIN IN BERKELEY IN 3059 VLSB AT 9:10 AM. Assess progress on projects (brief oral report); begin final data analysis, library work, and writing.

Dec. 8: 4 PM: FIRST DRAFT OF PAPER DUE IN PUBLISHABLE FORMAT.

***Dec. 13: CLASS MINI-SYMPOSIUM—PROJECT PRESENTATIONS.**

***Dec. 15: 4 PM.** Final copy of papers due as hardcopy (Lipps Lab, 4110 VLSB). Word and PDF formats (as attachments to jlipps@berkeley.edu). Papers will be published in the "class reports" book to be deposited in the UCB Library, Gump Station, sponsoring departments, and offices of officials in French Polynesia.

Dec 21: 4 PM: Final course grades available.

Faculty Schedule at Moorea and Emails:

Jamie Bartolome: 16 September--14 October.	jwbart@nature.berkeley.edu
Roy Caldwell: 14-28 October.	rlcaldwell@berkeley.edu
Carole Hickman: 22 October-4 November.	caroleh@socrates.berkeley.edu
Jere Lipps: 17 September-14 October.	jlipps@berkeley.edu
Brent Mishler: 17-30 September.	bmishler@calmail.berkeley.edu
Vince Resh: 4-19 November.	vresh@nature.berkeley.edu

Week 1: 9/17-23	Bartolome, Lipps, Mishler
Week 2: 9/24-30	Bartolome, Lipps, Mishler
Week 3: Oct 1-7	Bartolome, Lipps
Week 4: Oct. 8-14	Bartolome, Lipps
Week 5: Oct. 15-21	Caldwell
Week 6: Oct. 22-28	Caldwell, Hickman
Week 7: Oct 29-Nov 4	Hickman, Resh
Week 8: Nov. 5-11	Resh
Week 9: Nov. 12-18	Resh

GSI's: 17 September to 18 November
 Liz Perotti marinelizard@berkeley.edu
 Alison Purcell alison@nature.berkeley.edu
 Erica Spotswood espots@nature.berkeley.edu

Grading

Grades will be assessed by all the faculty and GSIs in detailed discussion. Each student will be represented by one staff member who will coordinate the discussion, but all staff will participate in the discussion and assignment of the grades. The criteria for grading are:

Exam on lecture material 10%

Field exercises (2); field notes 15%

Project

Proposal, draft intro, outline, drafts, all on time 5%

Symposium presentation 20%

Final report (includes effort) 40%

Project total 65%

Participation (active buddy, good citizen, helpfulness, station rules) 10%

LATE PAPERS WILL BE PENALIZED: We are under a tight schedule to read these, so there will be a penalty for late papers of 1 full letter grade for each day late. Dec. 20: Semester ends; grades available.

The Risks of International Education.

French Polynesia is a remote, foreign country with a non-English official language. As a result, living in French Polynesia entails some risk, including, but not limited to, potential problems with rapid access to health care, dangers associated with roads, vehicles, and traffic signs, dangers associated with beaches, shores, boat use, and water activities, dangers associated with trails and forests. While most of these risks are no greater than you would face in California, you must ALWAYS be careful and USE common sense. Travel within French Polynesia and travel to and from French Polynesia also entails some risk, as does all international travel. At the present time, French Polynesia is considered a safe destination for Americans. Nevertheless, the airline situation changes frequently on a world-wide basis that might impact us. Please keep informed of your airline's advice by consulting their web site several times before your flights so you can properly prepare to travel. Each student must take full responsibility for their decisions and actions. During all course activities each student will be expected to be accompanied by a buddy at all times. Each student, GSI and Faculty member is expected to read the Gump Visitor Guide (see <http://moorea.berkeley.edu>) prior to arrival and to abide by the Lab rules and regulations.

The laws and penalties of French Polynesia concerning driving, boating, drug and alcohol use, trespassing, relationships, public behavior, etc) vary from California laws you are used to. YOU ARE RESPONSIBLE for knowing these laws, even if you are a US citizen, so be sure you understand what you are doing. Common sense helps a lot, because you are not likely to read the criminal code of FP. If you have a question about an activity or need to conceal it, probably you should not do it. In particular, penalties are quite different for violations than California law.

Health insurance: You are advised to have health insurance, just as you do or would do in California while on campus. Check with Student Health Services or your private insurer to make sure you and your parents, if applicable, are satisfied with the coverage and method of payment and/or service to be provided overseas. Health care in French Polynesia is generally very good. You are advised to get emergency medical evacuation insurance in case of severe or long-term injury or illness because you probably would not want to spend a long time in a foreign hospital away from your own support group. Check with your insurer to make sure you are covered for this service. If not, you can get it through other insurers that provide travel services (AAA, STA, for example).

