Field Safety
Field research and study are an integral part of the biological sciences. Frequently, the nature of data collection or study requires the investigator to encounter physical and biological hazards as part of their fieldwork. Recognizing the inherent hazards associated with field work can help prevent injuries and illnesses associated with the tasks and result in a successful collection or field study. This document, drafted by Integrative Biology staff and Faculty, is intended to prevent illness and injury associated with field work and to serve as a guideline for all labs, field courses, and research conducted through the Department.

Before Entering the Field
Safety must be considered as an integral component of any course or research project. The faculty advisor presiding over a course or project is ultimately responsible for safety. Graduate student instructors or other designated persons present in their absence may be designated as supervisor and will be directly responsible for general prudence and ensuring proper safety practices under these guidelines. Before taking visitors or students into the field, or allowing them into the field without direct supervision, consider hazards that will be encountered including terrain, biological hazards, weather, crime, disease, or trauma and follow the protocols included in this document along with any other specific procedures identified in site-specific or process-specific plans. Consider the students' (and your own) relative fitness level before sending them on arduous tasks. In regions of elevated temperature, consider heat stroke, heat stress, and dehydration. In cooler climes or areas of water saturation, consider hypothermia. Leave an itinerary on file with the GSI/Administration including dates, contact information, and locations for all field excursions. Emergency contact information must be collected from each student and all GSIs beforehand. Students should be queried regarding special conditions (visible or hidden disabilities), special medical conditions (e.g., diabetes, allergies, epilepsy, etc.), or special accommodations. First aid kits should be carried in the field with adequate capacity to treat potential injuries that can be encountered. GSIs or instructors should be trained in First Aid. Consult your checklist to ensure all information and equipment are accounted for.

Safety Equipment
A list of safety equipment should be prepared and checked over before leaving. Examples include emergency road repair kit, flashlights, flares, proper clothing, water purification, medications, and specialized equipment (GPS, compass, charts, climbing gear, etc.).

Each PI or supervisor should create an equipment and safety checklist specifically designed and routinely modified for the location of their project. Use the equipment and safety checklist *before* you leave for the field.

Working in the Field
Use teamwork or at a minimum the buddy system for field classes or special assignments requiring arduous or dangerous fieldwork. Know your own and your field associate's limits and do not exceed them. One injured, ill, or seriously exhausted team member can reduce the functioning of the entire team. You should never be alone in the field. If you get separated, retrace your steps, back to the start point if necessary, until you find your group. Students are to tell their supervisor where they are working and are to stick to their prescribed routes or locations.

Conduct of Students and Workers
Dangerous horseplay, or other risky behaviors not related to research (e.g., firearm use, rock climbing, placing oneself in other harmful situations unnecessarily), will not be tolerated. The use of alcohol and non-medicinal drugs during university business is prohibited.

Accidents
Most accidents are related to slip, trip or fall. Wear proper footwear and choose paths of travel carefully, paying particular attention to streams, loose rocks, and steep pitches.

Communications
Students entering remote areas should bring a cell phone or use two-way radios. Emergency numbers and contacts should be compiled in advance. In areas of poor communication, or during a field emergency, one person should be appointed as the communications liaison. If necessary, a runner can be used between the central communicator and field unit.

Crime or Violence
Areas with dangerous activities should be approached with prudence. Some areas very close to home can be potentially dangerous when alone or if working at night. If a threatening condition occurs, relocate to a safer location such as locked car, populated area, or well-lighted area if possible. Refer to the UC Berkeley Police Department Personal Safety handbook for detailed personal safety information. Keep belongings, particularly small and expensive items (cameras, instruments, backpacks, etc.) either locked up or with you at all times. Maintain a group or buddy system when working in areas of crime (such as the Berkeley Marina after hours). See resources below.

Vehicle Safety
Students taking their own vehicle or driving others in their personal vehicles are responsible for the welfare of all riders. Vehicle load limits apply and seatbelts must be available for each person. Any driver of a University vehicle, or a vehicle rented by the university, must meet the minimum age specified on the rental agreement, have a valid California driver's license, and must follow all vehicle safety laws. Vehicles must be rented through a company that has a UC rental agreement.

Most fatal field accidents are related to vehicle travel. Drivers will use common sense and operate their vehicles in a conservative manner. Drivers should constantly remember their responsibilities and that their actions could affect the safety and lives of their occupants.

Stop if too tired to continue safely. All highway and local by-laws, rules, and regulations must be strictly adhered to. Private and university vehicles are not to be used for recreational or unsafe purposes while conducting university business.

Boats and Watercraft
Operation of boats or watercraft must comply with all pertinent regulations dictated by the California DMV, United States Coast Guard, local authorities, or meet the requirements of the jurisdictional waters they ply. The use of boats for university activities must also be coordinated with and approved by the UC Berkeley Small Boat Safety Committee. The safe boating course

self-test offered via the CA DMV must be taken by any motorized watercraft operator and kept on file with the Department. Any student operator must be checked out by an experienced faculty or field advisor. This includes the operation of human or sail-powered watercraft such as sailing dinghies, kayaks, canoes, etc. Safety equipment shall include PFDs, flares, handheld radio, and emergency supplies as deemed appropriate for the situation. All equipment and supplies should be checked before each excursion. The designated craft supervisor is responsible for assuring proper maintenance and safe functioning of the craft, and has the authority to terminate a voyage or excursion before or during a trip.

Medical and First Aid

Health risks are specific to area of travel. Consult health advisories for necessary immunizations or other precautions. Sites such as consulates, the CDC (see resources) are good sources for information. Carry a copy of your medical insurance agreement for emergency treatment.

First aid training is recommended for all participants. Environmental conditions such as exposure, dehydration, heat stroke and heat exhaustion must be considered in advance.

Make a first aid kit checklist (e.g., Mylanta, Advil, cold compresses, burn kit, dressings, etc.). Standard first aid kits usually need augmentation tailored to specific field conditions. Antihistamines, analgesics, disinfectants, and in some cases sutures and anti-venom may be necessary.

Preexisting conditions placing field workers at risk, or those under medication that may affect their ability in the field, must be identified to the field supervisor in advance.

Special Field Considerations

Recognize the potential for wildlife encounters with venomous insects and dangerous plants (poison oak, briar, etc.) and animals (snakes, mountain lions, jellies, etc.).

Animal sampling, trapping and handling techniques must be written into a protocol that includes the safety risks.

Consider communicable diseases (hemorrhagic fever, hanta virus, rabies, Lyme disease,etc.). See EH&S documents and OLAC (Office of Laboratory Animal Care) resources for more detailed information.

Consider training options. Discuss risks and hazards and incorporate preventative measures.

Tool Use

Hand tools or specialized equipment (climbing gear, chainsaws, etc.) must be adequately maintained and routinely inspected. Users should be well-acquainted with proper tool and equipment use. Specialized power tools such as chainsaws, chippers, etc. require safety equipment and training.

Firearms and Sampling Equipment
Sampling equipment using ballistics, energized sources, or other hazardous implements must have a standard operating procedure drafted and approved. This may be included in the animal use guidelines or sampling permit for mammals and other vertebrates. Any firearm in use by a university employee must have a California license and a copy on file with the UCPD. When traveling, the weapon is to be dismantled in such a state that it cannot be fired accidentally or otherwise. Active rounds are to be removed from the chamber and munitions are to be stored separately from the weapon. Any person sampling with a firearm or other propulsive source (crossbow, bow and arrow, slingshot, etc.) must have documented training.

Diving
All diving associated with the University comes under the purview of the Scientific Diving and Small Boat Safety Board. No SCUBA diving can be conducted in University research or courses without proper certification from the campus DSO (Diving Safety Officer).

Chemical Safety
Prudent practices used in the laboratory extend to the field. Proper personal protection (gloves, dust masks, respirators if necessary) should be worn. All chemicals transported (fixatives, solvents, etc.) must be transported in a labeled and durable secondary container. Any hazardous wastes must be disposed of properly and legally. MSDS sheets should be available in the field handbook and the hazards and safe handling reviewed by anyone who may come into contact with the chemicals.

Parents/Volunteers
Any person not officially associated with the University, either as a volunteer or in a non-payroll status (including parents, unofficial visiting scholars, non-registered students in summer) must sign the University Indemnity agreement.

Minors
Any minors must receive written parental consent before participating in any field-related exercises. A copy must be on file with the Department before field activities occur.

Insurance
Each student, staff, faculty member, or volunteer must have proof of medical insurance on hand. A copy of the medical card is to be on file with the Department before leaving for the field. A comprehensive copy is to be taken into the field by the PI/GSI in the event of the need for emergency care.

Reporting Injuries/Workers Compensation
All injuries must be reported to the course instructor and the department safety coordinator. Serious injuries requiring ongoing treatment may require filing for Workers' Compensation. Check with the department Workers' Compensation Coordinator for details.

Emergency Notifications
Chair Wayne Sousa must be notified of any serious injury, fatality, or other tragedy associated with the Department as soon as possible, but absolutely within 24 hours.

Other Resources
Each Field Station or site should have specific safety protocols outlined that also must be observed. These will detail specific hazards associated with that location. Campus EH&S also has a handbook titled Safety Guidelines for Field Research that has examples of common hazards and general guidelines that are useful resources.

Resources
Public Safety
http://public-safety.berkeley.edu/csp/

Risk Management
http://fbs.berkeley.edu/RISK/

UCOP Policies
http://www.ucop.edu/ucophome/policies/bfb/
Section BUS-23 is particularly relevant for students
Section BUS-74 for employees doing field research
Section BUS-75 for both

Environment Health and Safety Field Safety Guidelines
http://www.ehs.berkeley.edu/pubs/guidelines.html

Medical Safety and Information
http://www.cdc.gov/nceh/programs