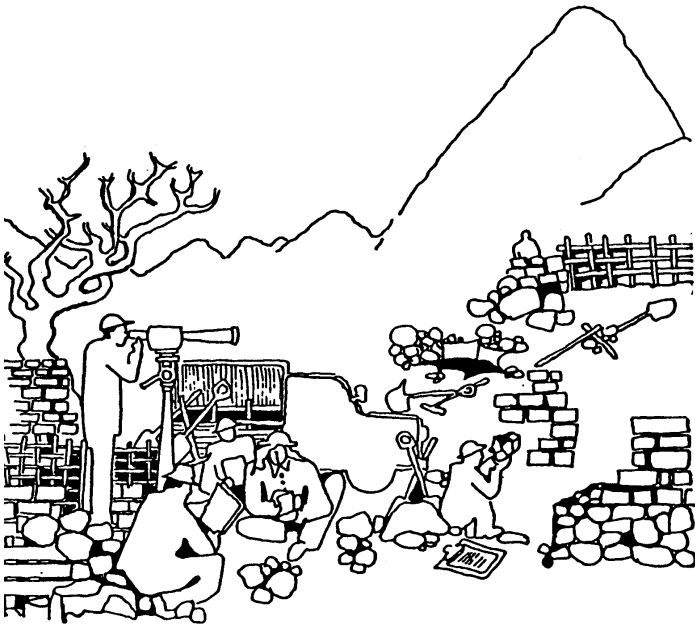


Safety Guidelines for Field Research



Office of Environment, Health & Safety
University of California, Berkeley

Emergency Phone List

Fill in the information for the area where you will be working.

Ambulance: _____

Sheriff: _____

Police: _____

Hospital: _____

Fire: _____

Other: _____

(Local Resident, etc.)

Or call 911

Safety Guidelines for Field Research

Office of Environment, Health and Safety

University of California, Berkeley

Safety Guidelines for Field Research

Fieldwork is an important part of teaching and research at the University. Since fieldwork activities take you off campus, this booklet is intended to help you plan and prepare for health and safety problems you might encounter in the field. For more specific information on fieldwork hazards and precautions, talk to your supervisor or contact the campus Office of Environment, Health and Safety (642-3073) or Occupational Health Service (642-6891).

Note: Specific first aid procedures are not covered in this booklet. A first aid kit and manual should be carried on *all* fieldwork excursions, and should be referred to in case of injury or illness. See Page 3 for information on first aid kits.

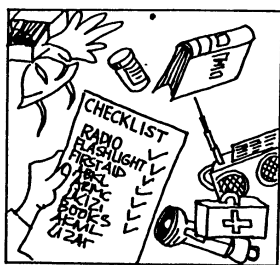
Table of Contents

Before You Leave	1
Medical Care and First Aid	3
Pests	4
Other Environmental Hazards	7
Diseases	10
Resources	14

Before You Leave

One of the most important phases of your fieldwork experience is planning and preparation *before* you leave. Here are some suggestions for a safe trip:

- Prepare a *written plan* of your trip, and leave this with a responsible party. Include the following:
 - **Your itinerary:** Locations, arrival and departure dates, names, addresses and phone numbers of all fieldwork participants.
 - **Contact person:** Name and phone number of a person to contact in case of emergency.
 - **Activities:** General nature of activities being conducted.
 - **Local contacts:** Names of people at or near your fieldwork site who can reach you if necessary, as well as your check-in/checkout arrangements.



Fieldworkers should check in with their group office regularly, and should advise the group office of any changes in schedule or points of contact. If possible, fieldworkers should also inform someone in their work locale (for example, local search and rescue personnel, police, sheriff, or motel employee) each day about the daily fieldwork location and the approximate time of return. After each day's work, the fieldworkers should notify the contact when they return. The local contact should be provided with the telephone numbers of people to call (group office, University contact, etc.) if the workers do not return or report in within a predetermined interval of the scheduled return time.

- Learn about potentially hazardous plants, animals, terrain, and weather conditions in the areas where

In addition to this booklet and the Office of Environment, Health and Safety (EH&S), your supervisor/ sponsor, other fieldworkers, local residents, and authorities, such as state and national park services personnel, may be able to provide you with helpful information.

- Take a CPR/First Aid class. Contact Cal Adventures (642-4000) or the Red Cross to enroll.
- Assemble safety provisions and check everything *before* you leave; safety provisions may include:
 - First aid kit and first aid manual. These should be taken on *any* trip.
 - Medications you regularly take
 - Allergy treatments (if you have allergies)
- Sunscreen and hat
- Water purification tablets or filter devices
- Personal protective equipment for fieldwork activities (safety glasses/goggles, gloves, hard hat, sturdy work boots, etc.). EH&S can recommend protective equipment depending on your activities.
- Vehicle emergency kit
- Flashlight
- Flares
- Two-way radio (if you will be working alone in an isolated or dangerous area)
- Whenever possible, fieldwork activities should be done in teams of at least two people. The “buddy” system is the safest way to work.
- Ask your health insurance provider about how your coverage applies to medical treatment in the field-work locale, should that become necessary.

Medical Care and First Aid

EMERGENCY MEDICAL CARE

The following guidelines apply to all off-campus operations including field stations, academic field trips, excursions, etc., that involve employees and students:

1. A first aid kit must be maintained at all times during the operation or exercise (see information below).
2. At least one employee who is trained in first aid must be present during operations.
3. At permanent University field stations, written arrangements must be made in advance with local facilities for emergency medical treatment. These must be reviewed by the Occupational Health Program. If you are working from a field station you should find out what the arrangements are for emergency care.
4. Each department has its own procedures for obtaining insurance coverage for emergency medical treatment. Field workers should know what these are before they leave.



If a University employee suffers a job-related injury or illness, their supervisor must be notified within 24 hours and must fill out an "Employer's Report of Occupational Injury or Illness" form #5020 so that benefits can be determined.

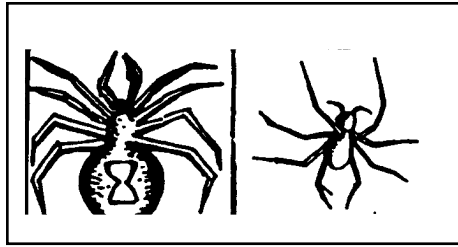
First Aid Kits

First aid kits are required for all off-campus operations, Campus departments purchase and maintain first aid kits. Contact OHP if special equipment or medication is needed. Kits and refills may be ordered from Storehouse or from safety supply companies. EH&S can supply a list of vendors.

Pests

A number of pests may be encountered in fieldwork. Follow these general guidelines to prevent close encounters of the painful kind:

- Keep garbage in rodent-proof containers and stored away from your campsite or work area. Food crumbs and debris may attract insects and animals.
- Thoroughly shake all clothing and bedding before use.
- Do not camp or sleep near obvious animal nests or burrows.
- Carefully look for pests before placing your hands, feet or body in areas where pests live or hide (e.g., wood piles, crevices, etc.).
- Avoid contact with sick or dead animals.
- Wear clothes made of tightly woven materials, and tuck pants into boots.
- Wear insect repellent.
- Minimize the amount of time you use lights after dark in your camp or work site, as they may attract pests and animals.
- Use netting to keep pests away from food and people.
- Carry a first aid manual and kit with you on any excursion so you can treat bites or stings. If the pest is poisonous or if the bite does not appear to heal properly seek medical attention immediately.
- Be aware of the appearance and habitat of pests likely to be found, such as those described in the following pages.



Black Widow

Brown Recluse

Spiders – Black widow or brown recluse spiders may be found in shady protected rock piles, under logs or bark, in outdoor privies and in old buildings. Both spiders can inflict painful bites which can cause local reaction, sweating, nausea, muscle cramps, fever and chills.

Scorpions – Scorpions normally hide during the day and emerge at night. They might be attracted to your camp or worksite to feed on other bugs drawn by light



or food crumbs. Commonly found in lumber piles, firewood piled in dark corners and under the bark of old tree stumps, scorpions can inflict a painful (wasp-like) sting. In some species the bite can be deadly.

Bees, Wasps, etc. – Bees, wasps, hornets and yellow jackets may be attracted to scented materials or food (hornets and yellow jackets are especially attracted to meat). All can inflict stings that are seriously or fatally allergic to some people. This is the most frequent cause of serious medical problems among fieldworkers, after trauma (i.e., falls, vehicular accidents). If you know you are allergic, contact OHP to discuss whether it is advisable to take medicine with you.

Conenose Bug – Conenose bugs (*Triatoma spp.*) may be found in areas animals inhabit, such as their nests. They breed in the dens of wood rats.

Conenose bugs thrive on blood, have a painful bite, and can cause a serious allergic reaction in some people. Rock climbers and those exploring rock shelters which harbor animal nests may be particularly prone to encounters with conenose bugs.

Fleas, Ticks—Fleas and ticks commonly inhabit animals and their nests and trails. Both are blood suckers, and their bites can spread diseases such as bubonic plague (flea) and Lyme Disease or Rocky Mountain Spotted Fever (tick). For more information, see the “Diseases” section beginning on page 10. When outdoors, wear clothing of tightly woven materials, tuck pants into boots and stay on the widest part of paths and trails. When you select a campsite or work site, you can check for these insects by dragging a piece of cloth or a garment over grass and shrubs, and examining it for fleas and ticks. Bear in mind that both pests can detect you coming a long way off—while fleas can jump onto you from a distance, ticks must wait until they are in direct contact with you to attach themselves.

Centipedes —Centipedes may be found under boards, in cracks and crevices, and moist locations, where they hide during the day and emerge at night to eat small insects. The centipede’s bite is more painful than serious.

Snakes—Several species of poisonous snakes are found in California. They generally stay under shady brush, particularly in hot areas. Snakes often bury their bodies, leaving the head above ground, positioning themselves along animal trails to prey on rodents. To avoid snakes, walk in open areas, wear heavy boots, and as you walk, use a stick to disturb the brush in front of you. If you are bitten, perform appropriate first aid and seek medical help immediately.



Other Environmental Hazards

In addition to pests, other fieldwork exposures can be hazardous. These include:

Poison Oak—This very common California “shrub” is characterized by a triple leaf pattern with prominent veins and shiny surfaces. The leaves are green in spring, yellow-green to pink or red in summer, red or russet brown in fall, and lose their leaves in winter. All parts of the plant contain a potent allergen that can cause a reaction anywhere from several hours to two weeks after exposure. The allergen is spread by:



- contact with the plant itself
- touching other objects which have touched a plant (tools, for example)
- inhaling smoke from burning poison oak
- touching other areas of the body after touching the plant

To prevent exposure, learn to recognize and avoid the plant and wear clothing such as long pants and long-sleeved shirts. If you come in contact with poison oak, wash clothes and skin with soap and water as soon as possible. Extremely sensitive people can be treated before exposure by “desensitization.” Contact OHP for information.

Impure Water—A variety of potentially harmful organisms and pathogens can live in “natural” water sources such as streams, lakes, and rivers. Drinking impure water can cause more than just gastrointestinal problems. Waterborne toxins can also cause hepatitis, giardia, and certain viral diseases. If you are not going to be near a municipal or treated water source, carry your own water. Never drink straight from a “natural” source.



If you must use these sources, treat the water first by using water purification tablets, boiling it for three minutes, or using a special purification filter (available from sporting goods stores).

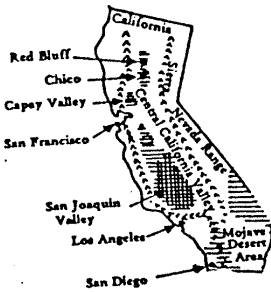
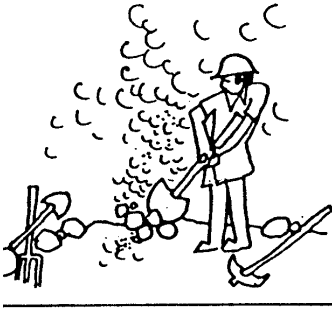
Exposure to the Elements—*Sunburn* is a common and easily preventable hazard. Chronic exposure to the sun can increase one's risk of skin cancer. People differ in their susceptibility to sun due to their skin pigmentation (redheads and blondes are more susceptible to skin cancer than are brunettes). Certain drugs, such as sulfonamides, oral antibiotics, certain diuretics, most tetracyclines, barbiturates, and biothionol (an ingredient in soaps and many first aid creams) can also increase susceptibility to the sun. To prevent sunburn, cover exposed skin and liberally apply sunblock creams. These creams come with skin protection factor (SPF) ratings from 5-50. Generally SPF 15 is adequate; there is little added protection from higher ratings. Wearing a long-sleeved shirt and hat will also provide protection from the sun.

Heat exhaustion, which can even affect individuals in excellent physical condition, is caused by prolonged physical exertion in a hot environment (such as strenuous hiking in the desert during the summer).



Heat exhaustion symptoms include fatigue, excessive thirst, heavy sweating, and cool and clammy skin, and are similar to shock symptoms. If these symptoms are present, cool the victim, treat for shock, and give water or electrolyte replacement slowly but steadily if the victim can drink. If heat exhaustion is not treated, the victim can suffer *heat stroke*. Heat stroke is far more serious than heat exhaustion. The blood vessels in the skin can become so dilated that the blood supply to the brain and other vital organs is reduced to inadequate levels, causing the individual to become exhausted and faint; the skin becomes bright red and very warm to touch. This is a potentially fatal condition that requires immediate attention. Cool the victim at once, in any way possible, replenish fluids as with heat exhaustion, and seek medical attention immediately. Failure to gradually acclimate to heat, or even minor degrees of dehydration or salt deficiency make an individual more susceptible to heat exhaustion. To prevent heat exhaustion, drink plenty of liquids (electrolyte replacers such as Gatorade® are excellent), and take frequent rest breaks. Salt tablets are *not* recommended for preventing dehydration.

Excessive Cold—On any trip, even a one-day excursion, where sudden changes in weather can occur, adequate clothing must be worn or carried. Prolonged exposure to excessive cold can lead to hypothermia, a lowering of the body temperature. Symptoms include shivering, numbness, slurred speech and excessive fatigue. Long pants, a long-sleeved shirt or sweater, a windbreaker or down jacket, and a cap are the minimal essentials. In cold or icy weather, it is best to wear clothing made of material that will wick moisture away from the body (e.g., wool or polypropylene instead of cotton). Wear several layers of clothing to allow adjustment to differing levels of physical activity. Avoid getting damp from perspiration.

Diseases



KEY

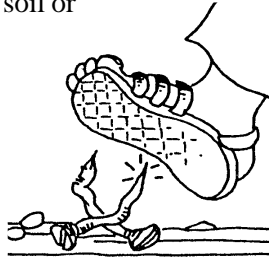
-  HIGHLY ENDEMIC AREA
-  ENDEMIC AREA (established)

Valley Fever (*Coccidioidomycosis*)—The fungus which causes this disease lives in the soil of certain arid areas, including California's San Joaquin and Sacramento Valleys, particularly in and around rodent burrows. Flu-like symptoms, including fever, chills, cough and chest pain, can appear from 1-4 weeks after exposure to contaminated soil. The disease can heal completely, cause residual lung damage or even progress to a fatal tuberculosis-like stage in unusual cases. African Americans and Filipinos appear to be most susceptible to Valley Fever. Nonresidents with even slight exposure to soil in the endemic areas (shown on the map) may contract this disease (lifelong residents develop an immunity). Infections occur most often in summer, especially after wind and dust storms. To prevent exposure

you should wet soil before disturbing it so dust is minimized, stay and sleep upwind of excavation sites, and use a dust mask for work with soil. *Fieldworkers who are not natives of the San Joaquin or Sacramento Valleys, but who plan to work on projects where contact with soil is likely should see their doctor for a skin test before leaving.* The test can determine whether you are *not* immune, and if these or other precautions are therefore necessary. If the test shows you are not immune,

call the California Department of Health Services (see page 14) for information as to the likelihood of exposure in the area(s) where you will be working.

Tetanus—The spores of this disease-producing organism can enter the body through puncture wounds, lacerations or burns that become contaminated with soil or excrement. This potentially fatal disease causes painful muscle contractions and spasms. The incubation period varies from four days to three weeks, depending on the extent and location of the wound. Fieldworkers should be sure that their tetanus shots are up to date, and should immediately perform first aid on any wound to prevent tetanus.



Rabies—Several wild and domestic animal species are reservoirs for rabies, including foxes, wolves, bats, coyotes, raccoons, skunks, dogs, and cats. In California, skunks and bats are primary carriers. Rabbits, squirrels, chipmunks, rats and mice are rarely infected. A bite from an infected animal can pass the generally fatal disease to humans. The disease attacks the nervous system; clinical symptoms of rabies infection include a sense of apprehension, headache, fever, and malaise. The disease progresses to paralysis and often includes muscle spasms when swallowing, which leads to hydrophobia. Eventually the infected person will undergo delirium and convulsions. The cause of death is respiratory paralysis. The period prior to the onset of symptoms is typically between 3-6 weeks; however, there can be wide variations. To prevent exposure, avoid contact with any wild animals, particularly sick or dead ones. Anyone whose work involves a risk of animal bites should consider immunization against rabies. If you are bitten by an animal, perform appropriate first aid and seek medical attention *immediately*, even if you have been immunized.

Lyme Disease—Lyme Disease is on the rise, especially on the Pacific Coast, the Eastern seaboard and upper Midwest. The disease is spread by the bite of an infected tick, with symptoms appearing within about one week. Symptoms include a donut-shaped red discoloration around the bite, joint pain, fever, chills, headache and malaise. Untreated Lyme Disease can appear to go away, only to return in more serious form later. Secondary stages can include heart complications and meningitis-like symptoms. Months to years later, an arthritis can appear, and the later stages can involve paralysis and dementia.

Rocky Mountain Spotted Fever—This disease is spread by tick bites, and is characterized by flu-like symptoms (fever, headache, muscle pain) and is often accompanied by a rash. Symptoms appear from 3-12 days after the tick bite. Summer is the height of the Rocky Mountain Spotted Fever season, but ticks are active and can transmit the disease from April to October. The disease is most prevalent in the Southeast and lower Midwest.

Plague—This disease has been found in several areas throughout California—mountains, foggy coastal belts, foothills and plateaus. Plague may be contracted through the bites from a rodent flea or by contact with infected animal tissues, or inhalation of the bacteria of the animal. Infected fleas may leave a sick or dead animal host and bite people. Symptoms of bubonic plague include swollen lymph glands, high fever, headache and nausea. The symptoms may appear from two to six days after infection. Untreated bubonic plague is fatal in about half of all reported cases. You should discuss immunization against plague with your doctor or Occupational Health Service if you are working in a plague-infested area or are likely to come in contact with fleas.

Hantavirus Pulmonary Syndrome (HPS)—Hantavirus Pulmonary Syndrome is a zoonotic respiratory disease caused by a newly discovered (1993) Hantavirus that, in California, is transmitted by the deer mouse.

While the risk of transmission appears to be low, HPS is difficult to diagnose and treat, and has a relatively high fatality rate (approximately 60% in 1993-94). The source of the infection is breathing dust or aerosols containing feces, urine or saliva from deer mice. The most likely ways to acquire the disease are by entering or working in buildings where there has been a heavy mice infestation, by excavating rodent burrows or sites very nearby them, or by directly handling the rodents or their carcasses. The buildings with highest risk are those that have been unoccupied for long periods (i.e., storage areas or seasonally occupied areas). Aerosols are made during the handling of live or killed rodents, or their traps.

The disease has an onset of 4-45 days. The initial phase consists of flu-like symptoms such as head or body aches, fever, cough, and less commonly, stomach cramps, nausea, vomiting or diarrhea. The second phase is characterized by severe difficulty in breathing caused by fluid in the lungs. Because of the severity of this disease, **anyone who develops the flu-like symptoms mentioned above within 45 days of a possible Hantavirus exposure must seek medical attention at once.** Be sure you tell the physician of the possibility of Hantavirus exposure.

The precautions against infection are the same for any method of exposure. The first defense against respiratory infection is the use of a HEPA-filtered mask or respirator. Other barriers, such as eye protection, gloves, and outerwear, and modified practices for handling rodents and traps are also recommended where appropriate. Wet mop, rather than sweep or vacuum, when cleaning buildings prior to use. Additional specific information is available from EH&S.

Resources

ON CAMPUS

Office of Environment, Health & Safety

Hazard information/evaluation

642-3073

Occupational Health Service

Medical exams and information

642-6891

Workers Compensation & Vocational Rehabilitation Office

Workers' compensation coverage/injury reports

643-9316

OFF CAMPUS

Fast Response

First aid/CPR training

849-4009

California Department of Health Services

Information on infectious diseases, immunization

(916) 445-4171

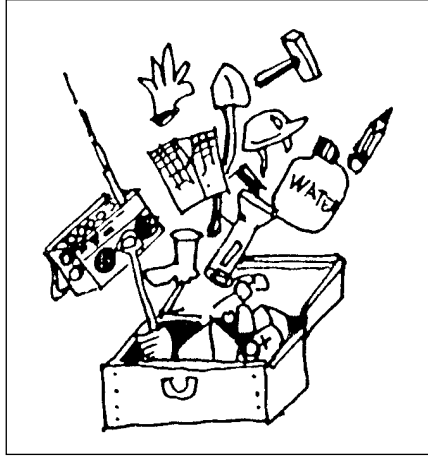
Alameda County Public Health Department

Information on infectious diseases, immunization

(510) 874-6192

Phone numbers of other county health departments can be found in local yellow page directories.

Trip Safety



Checklist

Prepare first aid kit and manual

Write fieldwork plan and file it at UC Berkeley and with local agency

Assemble and check safety provisions

Check to make sure immunizations are current

Check emergency medical care and health insurance



A publication of the
Office of Environment, Health & Safety
University of California, Berkeley

Artwork: Oruc Cakmakli

Text revisions: Brynte Johnson

Adapted for the EH&S World Wide Web site by Jerry Galena,
March 1996

© 1987, 1994, 1996 The Regents of the University of California