**Field Safety Manual**

Earth, Ocean, and Atmospheric Sciences

University of British Columbia

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##

# 01 Introduction

Fieldwork is an important part of teaching and research in the Earth, Ocean, and Atmospheric Science Department at UBC. Since fieldwork activities take you off campus, this guide is intended to help you plan and prepare for health and safety problems you might encounter in the field.

Geological fieldwork involves some level of risk; one part of this may come from chance events that are unpredictable. Another part of the risk, however, can be greatly reduced by awareness of hazards and good **risk management.** Persons undertaking field work must assess the risk, as far as possible, and this will vary in accordance with weather, topography and other conditions on the day and the experience, age, and other characteristics of the people doing the work. No person is advised or recommended here to undertake geological field work in any way that might place them in unreasonable risk. Individuals and leaders should carefully consider the safety aspects on the occasion of their visit and in bad conditions be prepared to cancel or modify part or all of the field trip as is necessary for safety. Appropriate safety and first aid equipment should be taken, and, ideally, cell phones should be available. Permission must be sought for entry into indigenous or private land and customs should be respected. Attention should be paid to weather warnings, local warnings and danger signs.

# 02 Field Safety Policy

The Department of Earth, Ocean, and Atmospheric Sciences Field Safety Policy applies to all faculty, staff and students who are involved in off-campus field activities related to research or teaching. The Departmental Field Safety Policy is in addition to the UBC Travel and Field Safety Policies and Procedures (<https://travelfieldsafety.ubc.ca/about/> and <https://srs.ubc.ca/health-safety/safety-programs/field-work-safety/>) with which all individuals engaged in field studies should familiarize themselves.

## Required Field Safety Documentation

For research-related field work, the Field Work Safety Plan is required to be completed and approved by the EOAS Local Safety Team and Department Head.

**Field Work Safety Plan**: This form consists of two parts.

* PART 1: COMMUNICATION AND EMERGENCY RESPONSE PLAN. This section provides an overview of the type of field work being conducted, where it is taking place, and who will be in the field. It identifies the field trip leader, field safety officer, and home-base check-in person. Emergency contact information, location and contact information of emergency services, communication plan, and emergency response plan are delineated here.
* PART 2: HAZARD IDENTIFICATION AND RISK ASSESSMENT. This section prompts the assessment of known and potential risks and appropriate safety measures that will be taken to mitigate those risks. While it is nearly impossible to foresee every event or hazard that may occur, this section serves to encourage you to think about risks in the field and how best to manage them.

**Hazard Identification and Risk Assessment Guidance Document:** This guidance document is a must-read in order to correctly complete PART 2 of the Field Work Safety Plan. Additional hazards and mitigation techniques are found in this Field Safety Manual (Section 10).

## Roles and Responsibilities

**Trip Leader:** Organize and delegate all research and logistical elements of the field work trip. Communicate with the Field Safety Officer and be knowledgeable on all safety-related elements (Trip Leader and FSO can be the same person). Check-in with a University Check-in person, or delegate responsibility to FSO (set alarm for check-in time).

**Field Safety Officer (FSO):** Complete all field safety forms, gathering all necessary information and distributing optional Medical Information form to team members. Be point-of-contact for all safety-related issues in the field; ensure safety equipment (e.g. first aid kit, bear spray) is present and in working order. Print the Trip Plan/ERP and distribute to team members. Obtain printed medical forms and carry in a sealed envelope.

**University Check-in Person:** Receive check-in messages and respond with acknowledgement that message was received (two-way communication). Set alarm for agreed-upon check-in times. Be up-to-date on all field plans prior to and during the trip. Follow “Failure to Check-in Procedure” if check-in is not received (this will be defined in the Trip Plan/Emergency Response Plan form).

# 03 CHECKLIST: What to do Before Leaving for the Field

**Being well-prepared is the most important thing you can do to ensure safety in the field. Have you completed these items BEFORE heading to the field?**

* Trip Plan/Emergency Response Plan, submitted to Local Safety Team for approval (Mandatory)
* Hazard Risk Assessment with field team, submitted to Local Safety Team for approval (Mandatory)
* Covid plan, submitted to Local Safety Team for approval (Mandatory)
* Sail Plan (for boat work only)
* Send approved forms to all field team members and hold safety discussion
* Provide optional and confidential Medical Form (completed form sealed in envelope and carried by field trip leader of field safety officer)
* Have you read the EOAS Code of Conduct?
* Racial risk assessment
* Appropriate first aid kit (check contents)
* Is any training needed?
* Ensure team has proper PPE

# 04 Field Safety Bill of Rights

To create a culture of field safety in EOAS, all students, staff, faculty, and all other field participants in the field party have the following rights and responsibilities:

**RIGHTS (all students, staff, faculty, and all other field participants in the field party have the right....)**

1. To an inclusive and safe work environment in the field.
2. To be informed about the plans, nature of work, and risks involved with the fieldwork in which you will be participating.
3. To request and obtain appropriate training for field safety issues and tasks from the PI (e.g. bear safety training, use of deterrent, scientific equipment use, etc.)
4. To carry, receive training on, and use remote field safety equipment, including appropriate communication devices (e.g. participants should be given access to bear spray, mosquito net, etc., and if necessary, satellite phones and inReach-type trackers)
5. To wear and have access to appropriate personal protective equipment (PPE) as needed (e.g. hardhats, safety vests, steel-toed boots, harnesses).
6. To express concerns about their safety and comfort, and that of the team, with the Trip Leader, Field Safety Officer, or other team leaders (e.g. camping site location, inadequate rest or sleep, inadequate bear-safe practices, discrimination or harassment, etc.).
7. To refuse to do activities they feel are unsafe or they are not comfortable as per [Worksafe BC guidelines.](https://www.worksafebc.com/en/health-safety/create-manage/rights-responsibilities/refusing-unsafe-work)
8. To have adequate shelter and food for the conditions and activities undertaken in the field.
9. To safe accommodations with whom they are comfortable (e.g. participants should not be required to share accommodations (like a tent) with a person with whom they are not comfortable).
10. To not be left alone in remote field settings if not desired and approved (e.g. participants should not be required to spend time sampling out of line of sight of others unless the participant feels comfortable doing so).
11. To experience and help create a respectful and inclusive social environment that would be acceptable in an on-campus setting (e.g., jokes, language, or other behaviors that are not acceptable on-campus are not acceptable off-campus).
12. To request a professional assessment if the participant feels they are experiencing a medical emergency, and be evacuated at no cost if needed (e.g. the flu, concussion, broken leg, etc.)
13. To be given support and assistance if the participant feels a UBC Policy SC7 (discrimination[[1]](#footnote-1)) or UBC Policy SC17 (sexual misconduct) violation has occurred. If deemed necessary by the participant, in discussions with a supervisor, for safety reasons and/or to file a complaint, early exit from the field at no extra cost to the participant will be facilitated (e.g. harassed because of gender, belittled because of religious background or nationality, sexual harassment, etc.)
14. To say something to the Trip Leader, Field Safety Officer, Project PI, or another team member if they feel uncomfortable or unsafe (**if you see something, say something**).
15. To exercise any of these field safety rights and responsibilities without retaliation or adverse effect on the participant’s academic progress or career standing.

**RESPONSIBILITIES (all students, staff, faculty, and all other field participants in the field party have the responsibility....)**

1. To foster a culture of safety for field work.
2. To be prepared to conduct the field work activities as determined by the worker(s) and supervisor.
3. To assess field hazards, identify mitigation measures, and if necessary take appropriate training BEFORE undertaking the field work (e.g. bear safety training, use of deterrent, scientific equipment use, etc.)
4. To wear appropriate personal protective equipment (PPE) as needed (e.g. hardhats, safety vests, steel-toed boots, harnesses).
5. To prepare and plan food and shelter ahead of time to ensure adequate meals and rest.
6. To communicate and plan with team members so as to avoid situations where members find themselves alone or out of sight.
7. To help create a respectful and inclusive social environment that would be acceptable in an on-campus setting (e.g., jokes, language, or other behaviors that are not acceptable on campus are not acceptable off campus).
8. To uphold and abide by the EOAS Code of Conduct, UBC Policy SC7 (discrimination1), and UBC Policy SC17 (sexual misconduct).
9. To say something to the Trip Leader, Field Safety Officer, Project PI, or another team member if they feel uncomfortable or unsafe (**if you see something, say something**).

**RESOURCES:**

[EOAS Field Safety](https://www.eoas.ubc.ca/about/safety/field-safety)

[UBC Travel and Field Safety](https://travelfieldsafety.ubc.ca/)

[Resources and Steps for Harassment and Discrimination Complaints](https://www.eoas.ubc.ca/edi-and-safety/have-a-complaint)

[Worksafe BC](https://www.worksafebc.com/en/health-safety)

# 05 Types of Field Work

Members of the Department of Earth, Ocean, and Atmospheric Sciences collect samples/data off-campus in many ways. These range from, but are not limited to:

* visiting the laboratories of colleagues outside UBC
* working at field stations and marine labs
* making observations or collecting samples in regional parks or at other established local sites
* making spontaneous road-side stops to observe or sample chance events
* conducting research observation/studies at established field sites
* conducting organized research trips to remote locations

The requirements for ensuring proper safety vary in each instance.

***Established Laboratories, Field Stations and Marine Labs:***

In the case of visits to laboratories and field stations with their own existing policies, researchers must comply with local regulations in addition to UBC safety guidelines.

***Observations/Sampling at “Field Friendly” Sites***

When the research and environment are such that the risk of any threat to safety is low, field safety requirements and training are at the discretion of the instructor/research supervisor. These may range from no requirement, to a call-in procedure to track the safe return of individuals from excursions, to some of the more formal procedures detailed in Section 02. The designation of a site as ‘field friendly’ is at the discretion of the principal investigator and possibly the Local Safety Team.

***Research Trips to Remote Locations***

In cases where individuals are travelling to sites where safety precautions are required to mitigate the consequences of any accident, the Trip Leader of the field activity must complete a Field Work Safety form prior to undertaking off-campus field activity (ideally two weeks in advance of the date that the field work begins).

Students and Faculty take part in two, distinctly different types of fieldwork that fall under this category.

1. Official graduate and undergraduate field courses, plus various weekend and other trips that are tightly-structured and planned. Departmental approval prior to departure is required for these.

2. Research fieldwork that usually involves a small number of people, and commonly involves a much less tightly constrained schedule. Fieldwork may take place in areas where potential hazards are much greater. Department approval is required and research Principal Investigators take practical responsibility for these activities.

It is appropriate to develop safety plans for both types of field activity that are tailored specifically to that activity. If there are regular trips with the same people to the same area, the process may be streamlined with a "standing approval", but ultimately it is required that the Department holds records of each off-campus field trip of this nature before departure.

# 06 Safe Field Work Strategies for Minoritized Individuals in the Field

Everyone who will be working in the field, whether in a remote or populated location, should consider the risks to all participants in the field from identity prejudice. These risks could include, but are not limited to, targeted conflict or violence against BIPOC individuals, sexual harassment or violence to women or LGBTQ individuals, prejudice against religious identities, or environmental risks for individuals with disabilities. The field location, local or regional laws, and local cultural norms should be assessed prior to initiating field studies. Situations that place individuals in uncomfortable and potentially unsafe positions should be avoided. At-risk individuals should play a role in determining the safety of the environment they are going to work in. This is not an individual task, however, and all members of the team should discuss and consider the risk, educate themselves on the potential risks to colleagues, and undergo training to learn how to support their colleagues (such as Bystander Intervention, Anti-harassment and Inclusivity training - see Training Resources document on the Safety webpage).

Field teams must assume that prejudice can occur in any situation, and discuss and prepare for all eventualities.

**Pre-trip risk assessment and discussion checklist**

Prior to any field trip, the following should be discussed by the team and supervisor with particular emphasis on the diversity of the team. Discussions about race/gender identity/religion etc. should be approached in an open and non-confrontational manner, to ensure they are fully discussed with the safety of the team members being the primary focus.

Ideally, any high level risks should be identified in the field planning stages, and alternative locations with lower risk factors identified. No person should ever feel unsafe in the field, nor be discriminated against because they have voiced their concerns.

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Discussed** | **Risks and Level (1 low to 10 high)** | **Actions / mitigation** |
| Location |  |  |  |
| Local laws |  |  |  |
| Contingency plan |  |  |  |
| Previous field participants experiences |  |  |  |
| Field managers / property owners |  |  |  |
| Work and communication schedule |  |  |  |
| ID / letters / institutional  |  |  |  |

##

# 07 International Field Work

All members of field trips going abroad should familiarize themselves with [UBC Travel Advice and Advisories](http://www.hr.ubc.ca/wellbeing-benefits/benefits/details/travel/travel-advisories/). UBC is a member of [International SOS](https://www.internationalsos.com/), a medical and security support service. If you run into any problems while you're traveling internationally you can contact them for support. UBC's membership number is 27AYCA486500 and the dedicated phone line at International SOS is (215) 942-8478. [Download International SOS Membership Card here](https://wiki.mdru.ubc.ca/images/c/c0/ISOS_Membership_Card.pdf). Download their [[Assistance App](https://www.internationalsos.com/assistance-app)] for security and medical alerts and assistance while traveling.

UBC also provides a number of other resources for international travel including:

* [UBC Travel Planning Tool](http://travelplan.ubc.ca/)
* [Student Safety Abroad Policy and planning tool](https://universitycounsel.ubc.ca/files/2018/09/policy69.pdf)

# 08 Safety Equipment

## PPE

Under the EOAS Field Safety Bill of Rights (Section 04), all students, staff, faculty, and all other field participants conducting or assisting in field research have the right to wear and have access to appropriate personal protective equipment (PPE) as needed (e.g. hardhats, safety vests, steel-toed boots, safety harness). This should be a conversation directly with the supervisor, but if a third party is needed to assess the necessity of PPE, the local safety team can act as arbitrator.

## In your Daypack

Here are some suggestions for what to carry in your day pack:

* Cell phone or satellite phone or personal locator beacon with the manual
* Personal first aid kit (see “First Aid Kit” for more information)
* Personal survival kit (see “Survival Kit that Weighs About a Pound”)
* Proper clothing, hat, boots, outerwear for worst possible weather
* PPE; e.g. safety glasses, hardhat, harness
* Water; consider 2L of water on a cool fall day, 3-5L on a hot summer day
* Water purification tablets
* Food and snacks; consider 2000-3000 calories.
* GPS and compass
* Detailed map of the site
* Headlamp
* Hand sanitizer
* Spare socks

Also consider: Prescription medication (i.e. epi-pen), prescription glasses, sunglasses, sunscreen and lipscreen, insect bite ointment, insect repellent and/or headnet.

## In the Car

ALWAYS check vehicle, jack, jack handle, lug wrench, spare tire. Other items to consider are:

* Shovel (large)
* Small hand ax
* Tow strap
* Jumper cables
* Pliers
* 6-way screwdriver
* Two emergency reflective mylar sleeping bags
* First aid kit with supplies, booklet, knife, etc. (see “First Aid Kit”)

## First Aid Kit

It is essential that participants take first aid kits with them in the field. There should be a portable

kit as well as one with extra supplies in the vehicles. First aid kits can be supplied by the EOAS department (Stores) or the principal investigator, and can often be requested with rental trucks (ask for ‘site-ready’). Before heading to the field, ensure that your first aid kit includes (but not limited to) the following:

* + 2 absorbent compress dressings (5 x 9 inches)
	+ 25 adhesive bandages (assorted sizes)
	+ 1 adhesive cloth tape (10 yards x 1 inch)
	+ 5 antibiotic ointment packets (approximately 1 gram)
	+ 5 antiseptic wipe packets
	+ 1 blanket (space blanket)
	+ 1 breathing barrier (with one-way valve)
	+ 1 instant cold compress
	+ 2 pair of nonlatex gloves (size: large)
	+ 2 hydrocortisone ointment packets (approximately 1 gram each)
	+ Scissors
	+ 1 roller bandage (3 inches wide)
	+ 1 roller bandage (4 inches wide)
	+ 5 sterile gauze pads (3 x 3 inches)
	+ 5 sterile gauze pads (4 x 4 inches)
	+ Oral thermometer (non-mercury/non-glass)
	+ 2 triangular bandages
	+ Trauma bandage
	+ Tweezers
	+ First aid instruction booklet
	+ It should also include the following non-prescription drugs:
		- Aspirin or non-aspirin pain reliever
		- Anti-diarrhea medication
		- Antacid
		- Syrup of Ipecac (to induce vomiting if advised by Poison Control Center)

## Survival Kit

Keep in a small nylon or Ziplock bag. Make sure it is always in your backpack. Replenish often.

Together, everything here can **weigh about a pound.**

* Mylar emergency sleeping bag.
* Wind and waterproof matches. Seal in a waterproof container. Make sure the striker is included.
* Fire starter. Ideally one that requires little manual dexterity.
* Multi-function pocket knife. Small but good quality. Leatherman or Swiss Army knife.
* Compass.
* Flashlight. One of the tiny LED lights is a good backup to the larger headlamp that you should have in your backpack.
* Loud whistle (pealess is best).
* A few heavy-duty Ziplock bags. For emergency water, to keep hands dry, etc.
* A large sheet of heavy-duty aluminum foil. Can form an emergency cup or a small pan to heat water over coals (do not use over hot flame).
* Small length of sturdy cord.
* Small roll of duct or adhesive tape. Consider wrapping duct tape around your reusable water bottle to save space.
* Large sheet of fluorescent orange plastic.
* Small amount of high-energy food or candy. Coffee, tea, or bouillon packets are good for making a hot drink that also restores salt and gives a psychological boost.
* Small reflective signal mirror.
* Paper and pencil stub.
* A few sanitary hand wipes.
* Small wire pocket saw (helps when gathering wood in emergency).
* Large garbage bags (emergency rain poncho or shelter).
* Big and small needle and strong thread (dental floss works as a strong light thread for repairing equipment).
* Wire.
* Safety pins.
* Candle.
* Mole skin or other blister preventative.
* QuikClot (high tech powder to stop severe bleeding).
* Small Sterno can or other micro-stove with fuel.
* Small roll of flagging tape and marker.

# 09 Vehicle Safety

**Driving and Vehicle Safety**

* Seat belts save lives. Everyone must be buckled before the vehicle moves.
* Only authorized drivers will drive UBC or rental vehicles.
* Ensure that the vehicle has safety equipment as listed above and a first aid kit.
* We will NOT drive past 11 pm, unless we are very close to home. IF we end up in a situation in which late driving is anticipated, the supervisor will pay for hotels, food, etc. to enable people to sleep.
* Drivers should not drive more than ~2 hours without a break.
* Ensure that there is a passenger list in the vehicle.
* Always check to make sure that all passengers are present before leaving a field trip stop.
* NO ONE may drink and drive.
* WE WILL obey the speed limits, and drive according to the weather and road conditions.
* NO use of cell phones while driving.
* NO texting while driving.
* Park the vehicles away from any potential source of fire, such as dry grass.
* All participants and drivers should identify who has keys (attached securely to a lanyard!) before they go out into the field.
* We will often be in areas where cell phone coverage is spotty or non-existent. We will try to determine where coverage occurs and have emergency plans based on this.
* NO one should take a vehicle without consent of an instructor, or without communicating a plan to the instructor; THE ONLY exception is in the case of an emergency
* One of the most frequent driving issues that occur in the field are small incidents in parking lots, campgrounds, etc. These can be avoided by having other people watch for obstacles, people, and other vehicles, particularly when backing up.

# 10 Potential Physical, Environmental, and Animal Hazards

This manual does not attempt to cover specific situations – there are far too many to cover here.

Field workers should study information on the specific conditions, situations, dangers, and

emergencies they might encounter in the field in the following resources. Please study

them thoroughly. The identification of the hazards and their inherent risks will be an exercise to fill out in the Hazard Risk Assessment document.

**Physical and Environmental Hazards**

There are many general physical and environmental hazards that exist in nearly every location worldwide. All field researchers, regardless of the work location, should read through this section to learn more about some general physical and environmental hazards. If your research is in North America, please also read Section B: North America. If your research will take you out of North America, please also read Section C: International.

**A. General**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hazard**  | **Location**  | **Cause**  | **Symptoms**  | **Prevention** |
| **Vehicle****Accident** | Worldwide  | -Fatigue -Impaired driving -Driver error -Roadway factors -Vehicle factors | -Various trauma injuries or death | -Obey traffic laws -Wear your seatbelt -Don’t drive impaired -Don’t speed or drive recklessly  |
| **Boating****Accident** | Worldwide  | -Lack of proper training -Fatigue -Severe weather -Alcohol impairment -Dangerous/ unfamiliar conditions | -Various injuries or death  | -Proper training and certification by appropriate authority -Don’t drive while impaired -Don’t speed or drive recklessly |
| **Slips, trips,****falls** | Worldwide  | -Loose, irregular or slippery surface -Wrong footwear -Poor lighting -Obstruction -Improper (or lack of) use of ladders -Inattention or distraction | -Strains, fractures, bruises and contusions (head, wrist, elbow, shoulder, back, hip, knee, ankle) | -Proper “housekeeping” -Wear proper footwear -Adequate lighting -Don’t carry oversized objects -Use ladders properly |
| **Dehydration** | Worldwide  | Not enough water intake  | -Increased thirst -Dry mouth -Flushed face -Dizziness -Headache -Weakness-Muscle cramps -Dark urine | -Drink plenty of water (at least 2 liters per day), more if working strenuously or in a warm climate |
| **Impure Water** | Worldwide  | Harmful organisms and pathogens living in water sources | -Gastro-intestinal illness -Flu-like symptoms | -Carry your own water -Treat water before use with tablets, purifiers, or by boiling for > 3 minutes |
| **Sunburn** | Worldwide  | Excessive exposure to the sun | -Irritated skin, pink or red in color | -Wear long sleeved clothing and a hat -Apply SPF ≥30 sunblock  |
| **Heat****Exhaustion** | Worldwide - hot climates | Prolonged physical exertion in a hot environment | -Fatigue -Excessive thirst -Heavy sweating -Cool, clammy skin | -Acclimate to heat gradually -Drink plenty of liquids -Take frequent rest breaks |
| **Heat Stroke** | Worldwide – hot climates | Prolonged physical exertion in a hot environment | -Exhaustion -Light-headedness -Bright red warm skin | -Acclimate to heat gradually -Drink plenty of liquids -Take frequent rest breaks |
| **Frostbite** | Worldwide – cold climates | Exposure to cold temperatures | -Waxy, whitish numb skin -Swelling, itching, burning, and deep pain as the skin warms | -Dress in layers -Cover your extremities with warm clothing, e.g., hats, facemask, gloves, socks, and shoes |
| **Hypothermia** | Worldwide – cold climates | Prolonged exposure to cold temperatures | -Shivering -Numbness -Slurred speech -Excessive fatigue | -Dress in layers -Wear appropriate clothing -Avoid getting damp from perspiration |
| **Carbon****Monoxide** | Worldwide  | Running a vehicle or burning a fuel stove in an enclosed space | -Severe headaches -Disorientation -Agitation -Lethargy -Stupor -Coma | -Keep areas adequately ventilated when burning fuel -Ensure that vehicle tailpipe is not covered by snow |
| **Extreme****Weather** | Worldwide  | Snow squalls, blizzards, heavy rains, lightning, tornadoes, hurricanes, flash floods | Severe weather can result in physical injury and/or death | -Be aware of special weather concerns -Bring appropriate equipment to deal with severe weather |
| **High Altitude Illness** | Worldwide – high altitudes | Decreased oxygen intake and increased breathing rate | -Headache -Nausea -Weakness | -Allow your body to acclimatize by gaining elevation slowly |
| **Water/Immersion in water** | Worldwide  | -Currents, waves, turbulent, fast moving water -Drop-offs | -Drowning or near drowning -Injuries | -Familiarize yourself with water safety practices and techniques -Use proper gear including flotation devices -Protective footwear for wading, marsh, reef, or rocky bottom research |
| **Red/Brown****tides** | Red tides occur on both sides of the Atlantic, and along the Pacific coast to Alaska | Algal blooms  | -Respiratory distress -Dead fish -Discolored water | -Avoid areas where tides are in bloom |

**B. North America**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hazard**  | **Location**  | **Cause**  | **Symptoms** | **Prevention** |
| **Hunting** **Season** | United States and Canada | Local hunting seasons and regulations vary  | -A hunting accident may result in serious injury or death | -Wear appropriately colored safety clothing -Avoid animal like behavior (e.g. hiding in thickets) |
| **Poisonous** **Plants** | North America | Exposure to poison ivy, poison oak, or poison sumac plants | -Itchy rash -Red, swollen skin | -Avoid contact with poisonous plants -Use pre-exposure lotion -Wash clothes and skin with soap and water after exposure |

**C. International**

|  |  |  |  |
| --- | --- | --- | --- |
| **Hazard**  | **Location**  | **What to do if** **encountered** | **Prevention** |
| **Violence caused by political unrest or military conflict** | International  | Leave the area as soon as it is safe to do so | -Be aware of current travel advisories (Security travel advisories are available from International SOS- See Section II, First Aid for access information) |
| **Theft**  | International  | Report theft immediately to local authorities | -Keep wallet in front pocket -Carry shoulder bag diagonally and keep bag in front under your arm |

**Animals and other indigenous creatures**

There are many general safety hazards pertaining to animals and other indigenous creatures that exist in nearly every location worldwide. All field researchers, regardless of the work location, should read through this section to learn more about some general guidelines to prevent unwanted animals and “pests”.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type**  | **Location**  | **Most Dangerous Species** | **What to do if encountered**  | **Prevention** |
| **Mosquitoes**  | Worldwide – especially wet areas  | Mosquitos can serve as vectors for many diseases including: malaria, dengue, West Nile, and zika |  | -Use insect repellent -Don’t leave standing pools of water -Use bed nets |
| **Rodents**  | Worldwide  | Rodents can transmit diseases such as: hantavirus, leptospirosis, and salmonella | -Don’t touch a rodent, dead or alive | -Keep areas clean to avoid attracting rodents -Store food in sealed containers |
| **Flies**  | Worldwide  | Flies can serve as vectors for many diseases including: conjunctivitis, poliomyelitis, typhoid fever, tuberculosis, anthrax, leprosy, cholera, diarrhea and dysentery | -Remove insects from the area if possible  | -Use insect repellent-Avoid areas with heavy fly infestations |
| **Fleas &** **Ticks** | North America  | Ticks can serve as vectors for many diseases including but not limited to Lyme disease | -Brush away if not attached -If attached remove quickly -Remove from premises | -Wear long clothing with tightly woven material -Wear insect repellent -Tuck pants into boots -Drag cloth across campsite to check for fleas/ticks -Protect pets -Avoid shrubbery -Stay on widest part of path |
| **Spiders**  | North America  | Black Widow and Brown Recluse | -If you cannot leave/avoid the area, remove the spider from the area without using hands directly | -Use care around rock piles, logs, bark, gardens, outdoor privies, old buildings -Wear gloves when working outside -Shake out clothing and bedding before use -Do not pick up or disturb a spider -Avoid locations where spiders may be such as dark places |
| **Bears**  | North America  | Black Bear (North America), Grizzly Bear (Alaska, Western Canada, Pacific Northwest), Polar Bear (Arctic) | -Do not run -Move slowly and speak in a low soft voice -If attacked, lay in the fetal position and protect head -Play dead | -Keep food out of sleeping areas -Never approach a bear (or bear cub) -Wear a bell or other noisemaker -Stay away from the bear’s food supply-Take bear safety training |
| **Mountain** **Lions** | North, Central, and South America | All  | -Do not run, back away slowly, do not corner it - Do not play dead, look it in the eyes -Make yourself look larger (arms overhead), do not bend down -Use a loud voice -Throw sticks or rocks -Fight back, poke it in the eye with your thumb -Protect your neck and head | -Do not leave children or pets unattended -Do not feed deer -Avoid hiking, biking, jogging alone or other outdoor activities when mountain lions are most active, dawn, dusk, and at night -Avoid walking near dense growth, rock outcroppings, ledges -Always look up and behind you -Carry pepper spray |
| **Snakes**  | North America, Mexico | Rattlesnakes, Cottonmouths, Coral Snakes, Moccasins, and Copperheads | -Back away slowly while keeping an eye on the snake -Do not make fast movements | -Walk in open areas -Wear heavy boots -Use a stick to disturb the brush in front of you - Do not pick up, disturb, or corner a snake -Back away from a snake -Avoid locations where snakes may be |
| **Bees,** **Wasps, etc** | North America  | Bees, wasps, hornets, and yellowjackets, Africanized Killer Bees (Southeast United States) | - Do not swat or kill – this may elicit an attack response from other bees/wasps -Leave the area immediately and quickly -If being chased move into a closed area if possible -Cover face  | -Bring medication if you have an allergy (the sting may be fatal) -Keep scented foods, drinks and meats covered -Wear shoes outside - Avoid wearing bright colors, flower prints and perfume -Move slowly or stand still (don’t swat at insects) |
| **Scorpions**  | North America – especially Arizona, Southeast California, Utah and Mexico | All  | -If you cannot leave/avoid the area, remove the scorpion from the area without using hands directly | -Shake out clothing and bedding before use -Avoid lumber piles and old tree stumps -Wear gloves when working outside -Do not pick up or disturb a scorpion -Avoid locations where scorpions may be |

##

# 11 More information

## Some Outdoor Injury Facts

**Field work is relatively safe**

* For example, in a 2003 report, England reported that out of 7 to 10 million people involved in outdoor programs, they had just one death.
* Statistically, the highest-risk part of the field work experience is driving to and from the field.
* U.S. national parks report an average of 9.2 injuries per 100,000 visits (sprains and breaks, water-related, and falls are most common).

**Most Common Serious Non-vehicular Field Injuries to U.S. Geological Survey Geologists**

1. Slips, trips, and falls
2. Back injuries
3. Broken limbs
4. Insect bites/stings – mostly bee stings

**Most common reasons backcountry visitors are injured or killed:**

1. Falls
2. Drowning
3. Heart attacks
4. Hypothermia/exposure
5. Heat stress
6. Lightning
7. Avalanche
8. Flash floods
9. Insects
10. Snakes, spiders
11. Predators

## Having the Right Mental Attitude

**Common Factors Leading to Injury Accidents**

• Lack of experience

• Risk-taking attitude

• Overconfidence

• Goofing off, carelessness

• High-risk activities (heights, steep slopes, speed)

• Weather changes (deteriorating weather)

• Working on or near water

• Fatigue (accident rates definitely do increase in the afternoon)

**Why Smart People Make Dumb Mistakes – and what to do about it!**

• Recognize that we are prone to make mistakes (often, the more experienced we become, the more prone we are to be casual, i.e. – careless)

• Stop – force yourself to think about safety

• Make a safety checklist – review it before each trip

• Watch for signs that a situation is deteriorating (weather, my health, my attitude, terrain, etc.)

• Ask yourself these questions:

* What is my ultimate goal? Hint: It is NOT to complete the task. It IS to return home safely at the end of the day or project.
* What are the dangers I could face in this activity?
* How much am I willing to risk?
* What are the warning signs I might see that a situation is deteriorating?
* What is my plan for “bailing out” before things get bad?
* How bad does it get before I quit?

**When something bad happens – S.T.O.P.**

**•** **Stop –** sit down, slow your breathing, calm yourself, sip some water, suck on some candy. Even in an emergency – take a few seconds; do not make one tragedy become two.

**• Think –** force your analytical mind to take over; resist the urge to panic, react automatically, or make hasty reactions

**• Observe –** your surroundings, your own condition, your resources, your options

**•** **Plan –** make a decision, then proceed slowly and thoughtfully (but alter the plan if needed)

# 12 Acknowledgements

The EOAS Field Safety Manual drew heavily from the following resources, with thanks:

* Utah State University Geoscience Department Safety Manual
* Arizona State University, Environment, Health & Safety
* University of Alaska Fairbanks Geophysical Institute
* University of British Columbia Zoology Department Field Safety Policy and Procedures
1. Policy SC7 protects against discrimination based on (actual or perceived) ancestry, colour, family status, marital status, physical or mental disability, place of origin, political belief, race, religion, sex, sexual orientation, gender identity or expression, and criminal conviction unrelated to employment [↑](#footnote-ref-1)