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UNIVERSITY OF MAINE

FIELDWORK SAFETY PLAN

Revised: April 9, 2002

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1.0 University of Maine Approval

Fieldwork, including academic field trips and research activities, is an essential part of teaching and research for the University of Maine (University). The range of activities in the field is potentially as broad as the intellectual diversity of the interests of faculty, staff, and students within the University. As a response to our continuing commitment to safety, these guidelines have been developed to assist personnel with planning and preparing for health and safety problems that one may encounter in the field.

2.0 APPLICATION AND SCOPE

Fieldwork consists of teaching or research activities that are undertaken by faculty, staff, or students of the University at a location outside the geographical boundaries of the University of Maine campus or another University operated facility (aka: Installations). These guidelines, however, do not pertain to teaching or research activities at establishments where a safety plan already exists (i.e. conferences, other institutions, Darling Marine Center, MAFES Farms). The intent of these guidelines is to ensure that prior to undertaking fieldwork:

1. all concerned parties are aware of their responsibilities for field-related activities;
2. a risk assessment is carried out to identify potential hazards associated with the fieldwork and to establish appropriate controls or measures to eliminate or minimize such hazards; and
3. all participants have an informed understanding of the associated risks and provide their consent to the means for dealing with such risks.

3.0 RESPONSIBILITIES

All participants in fieldwork bear some degree of responsibility for health and safety. The primary responsibility, however, lies with the principal investigator or faculty member in charge of the project or field trip. Diligence must be exercised by all concerned parties in giving attention to the nature of, and the means for dealing with, the categories of risk that may be associated with each location or environment.

3.1 Department Chair or Director

The Department Chair and Director is responsible for:

1. ensuring that all faculty members or principal investigators are aware of the guidelines for field trips and field research;
2. ensuring compliance with these guidelines within the department or school; and
3. developing and maintaining a contact list for Principal Investigators or Faculty Members who perform solitary fieldwork.

3.2 Principal Investigator or Faculty Member

The ultimate responsibility for compliance with these guidelines lies with the Principal Investigator or the Faculty Member. In particular, the Principal Investigator or Faculty Member is responsible for:

1. identifying and assessing the environmental, health, and safety hazards associated with the specific field project or trip;
2. establishing controls to reduce or eliminate the environmental, health, and safety hazards associated with the specific field project or trip;
3. ensuring a reliable means of emergency communication;
4. determining how to contact the local emergency services;
5. securing the proper emergency equipment, including but not limited to a first aid kit, bug spray, water, food, gasoline, flares, spare tire, automobile jack, and jumper cables;
6. obtaining departmental or school approval where appropriate;
7. ensuring that the appropriate controls are implemented, including the provision of appropriate personal protective equipment, procedures, and training;
8. attending all required training sessions;
9. ensuring someone (preferably more than one) in your party is first aid / CPR certified;
10. reporting any employee injury or accident within twenty-four hours of the incident by contacting Gates McDonald. (University of Maine Workers' Compensation Administrator) at 1-866-466-4606;
11. submitting the name of their designated contact person to the Department Chair or School Director if he or she will be performing solitary fieldwork; and
12. notifying the designated contact person prior to leaving and upon safely arriving back to campus if you are planning to work alone in the field.

3.3 Technicians or Students

Each technician or student that participates in a field trip or a field research project is responsible for:

1. following all rules or procedures set by the Principal Investigator or Faculty Member;
2. attending all required training sessions;
3. using appropriate personal protective equipment provided;
4. working and acting in a safe manner to prevent harm to himself/herself or to others;
5. reporting any identified hazards to the Principal Investigator or Faculty Member; and
6. reporting all accidents, illnesses, or emergencies to Principal Investigator or Faculty Member.
7. notifying the Principal Investigator or Faculty Member prior to leaving and upon safely arriving back to campus if you are planning to work alone in the field.

4.0 PLANNING THE TRIP

One of the most important phases of the fieldwork experience is planning and preparing for the trip. Several issues must be considered prior to and during these operations. These issues include completion of a hazard assessment, establishment of appropriate or adequate communication systems or procedures, and procurement and assembly of necessary equipment and supplies.

4.1 Hazard Assessment

Prior to beginning the fieldwork, a hazard assessment should be completed to evaluate the potential hazards associated with the project. Information that you obtain from this assessment should assist you in determining the appropriate equipment and training required for the fieldwork.

4.2 Communication

Communication systems, such as radio or cellular phone, must be appropriate for a specific operation and location. For example, a cellular telephone may not be adequate or appropriate form of communication if there is a lack of range or repeater towers in the

area of operation. Once a form of communication has been selected, all personnel involved in the operation must be trained on the operations of the communication device.

Emergency telephone numbers shall be determined prior to leaving the University of Maine. Currently, not all areas in Maine are serviced by 911. Local emergency telephone numbers can be located inside the front cover of the local telephone book.

4.3 Procurement and Assembly of Necessary Equipment

Necessary equipment, not just for the completion of a specific operation, but for safety and emergencies, should be chosen for need and appropriateness to the task and environment. This equipment should become apparent after the risk assessment is performed. The safety equipment may include, but are not limited to the following:

- First aid kit and manual
- Navigational tools (maps, compass, GPS, -etc...)
- Personal Protective Equipment
- Communication Devices
- Extra food and water
- Automobile Jack
- Batteries
- Fire Extinguisher
- Allergy or other Medications
- Water purification tablets or filter devices
- Sunscreen and hat
- Flashlight
- Spare tire (maybe two)
- Road Flares
- Epi Pen (Physician Prescribed)
- Bug Spray

5.0 TRAINING

Personnel must receive the appropriate training for the functions and environment they will be operating in. Consideration needs to be given to the preparedness of the individual and their ability to operate and function in a particular remote environment. Some students may have spent a great portion of their life in the woods, whereas others have never been outside of a large city.

5.1 Required Training

All employees who will be participating fieldwork, (academic field trips and research activities) shall be required to obtain the following training:

1. Basic Safety Training - Basic Safety Training is required for all University of Maine employees. It is to be completed annually through the Internet at <http://www.ume.maine.edu/~ehs/safetytraining/intro.htm> or in a classroom setting provided by the Department of Environmental, Health, and Safety.
2. First Aid / CPR Training - A minimum of one person per party shall be First Aid / CPR certified. However, it is recommended that more than one person per party should be certified. This training can be scheduled through the Department of

Environmental, Health, and Safety, or the American Red Cross. Currently, First Aid / CPR Certifications are good for two years.

3. General Fieldwork Safety Training - General Fieldwork Safety Training will be provided by the University twice every spring semester. This training is required for all University employees and students who will participate in fieldwork activities. However, if a student is to only participate in an academic field trip, they are not required to obtain the General Fieldwork Safety Training. A Principal Investigator or Faculty Member may decide to administer the General Fieldwork Safety Training to the members of their fieldwork party. The required training information that shall be reviewed with all members of the fieldwork party is located in Appendix A. This training shall be documented. The content of the General Fieldwork Safety Training will include but is not limited to:

- Planning a Safe Trip
- Hazardous Materials
- Animals, Insects, and Plants
- Driving on Logging Roads
- PPE Selection
- Hazards Associated with Weather
- Hazard Assessments
- Emergency Preparedness

5.2 Additional Training

Additional training may be required depending on the activity or environment. The Principal Investigator or Faculty Member will be responsible for determining the need for additional training for the members of the research party or group. To obtain more information pertaining to the additional training listed below, please contact the Department of Environmental, Health, and Safety.

- Chainsaw Safety
- Animal Use and Care
- Trenching and Excavation Safety
- Hearing Conservation
- Tractor Safety
- Work With or Around Electricity
- Respirator Use
- Watercraft Safety
- Fall Protection
- Pesticide Application
- Diving
- Recreational Vehicle Safety
- Fire Extinguisher Safety
- Driver's Awareness

6.0 SUPERVISOR'S INJURY REPORTS

All injuries that occur during fieldwork shall be reported to Gates McDonald, the University of Maine workers' compensation administrator, by telephone (1-866-466-4606). Injuries shall be reported to within 24 hours of occurrence and all deaths shall be reported immediately.

7.0 SOLITARY FIELDWORK

Solitary fieldwork is strongly discouraged, particularly those involving remote or hazardous locations, high-risk activities, or other unique conditions. In situations where solitary work is deemed necessary and unavoidable, a stringent code of practice must be established to address worker safety. Principal Investigators or Faculty Members are required to notify their designated contact person (i.e. spouse, coworker, etc...) prior to leaving and upon safely arriving back to campus. The designated contact person should know the location of the fieldwork site, what route(s) will be taken to and from the site, and when the Principal Investigator or Faculty Member is due back. A list of designated contacts will be kept by the Department Chair or School Director and shall be readily accessible in case of an emergency.

Technicians and Students are required to notify their Principal Investigator or Faculty Member with the same information prior to leaving campus. They are also required to check-in upon safely arriving back to campus. In addition, any individual performing solitary fieldwork is required to have a communication device on their person at all times.

8.0 PRE-DEPARTURE CHECKLIST

- ___ Identify the health and safety hazards associated with the field project or trip
- ___ Obtain local emergency phone numbers
- ___ Preview the predicted weather conditions for your trip
- ___ Assemble and check safety provisions before you leave
 - ___ First Aid Kit and Manual
 - ___ Navigational Tools
 - ___ Personal Protective Equipment
 - ___ Communication Devices
 - ___ Allergy or Other Medications
 - ___ Water Purification Tablets or Filter Devices
 - ___ Sunscreen (SPF 15 minimum) and Hat
 - ___ Bug Spray
 - ___ Flashlight
 - ___ Extra Food and Water
 - ___ Road Flares
 - ___ Fire Extinguisher
 - ___ Automobile Jack
 - ___ Spare Tire (Maybe Two)
- ___ Communicate with your designated contact person informing him or her with the proper information prior to leaving campus(if applicable)
- ___ Attend required and additional safety training
- ___ Review plan, communication devices, potential hazards, and emergency information with members of the team
- ___ Check in with your contact person when you arrive back to campus (if applicable)

APPENDIX A

GENERAL FIELDWORK SAFETY TRAINING CONTENT

PLANNING A SAFE TRIP / EMERGENCY PREPAREDNESS

One of the most important phases of the fieldwork experience is planning and preparing for the trip. Several issues must be considered prior to and during these operations. These issues include completion of a hazard assessment, notifying your designated contact person if you plan to perform in solitary fieldwork, establishment of appropriate or adequate communication systems or procedures, and procurement and assembly of necessary equipment and supplies.

Hazard Assessment:

Prior to beginning the fieldwork, a hazard assessment should be completed to evaluate the potential hazards associated with the project. Information that you obtain from this assessment should assist you in determining the appropriate equipment and training required for the fieldwork.

Solitary Fieldwork:

Solitary fieldwork is strongly discouraged, particularly those involving remote or hazardous locations, high-risk activities, or other unique conditions. In situations where solitary work is deemed necessary and unavoidable, a stringent code of practice must be established to address worker safety. Principal Investigators or Faculty Members are required to notify their designated contact person (i.e. spouse, coworker, etc...) prior to leaving and upon safely arriving back to campus. The designated contact person should know the location of the fieldwork site, what route(s) will be taken to and from the site, and when the Principal Investigator or Faculty Member is due back. A list of designated contacts will be kept by the Department Chair or School Director and shall be readily accessible in case of an emergency.

Technicians and Students are required to notify their Principal Investigator or Faculty Member with the same information prior to leaving campus. They are also required to check-in upon safely arriving back to campus. In addition, any individual performing solitary fieldwork is required to have a communication device on their person at all times.

Communication:

Communication systems, such as radio or cellular phone, must be appropriate for a specific operation and location. For example, a cellular telephone may not be adequate or appropriate form of communication if there is a lack of range or repeater towers in the area of operation. Once a form of communication has been selected, all personnel involved in the operation must be trained on the operations of the communication device.

The Principal Investigator shall obtain the local emergency phone numbers prior to performing the fieldwork. Usually, 911 will reach emergency services in most parts of Maine. However, some locations still do not have 911 service. In that case, locate the local emergency telephone numbers in the local phone book. If you are able to use a cellular phone, 911 or *77 will reach the Maine State Police. *22 will reach the local sheriff's office.

Procurement and Assembly of Necessary Equipment:

Necessary equipment, not just for the completion of a specific operation, but for safety and emergencies, should be chosen for need and appropriateness to the task and environment. This equipment should become apparent after the risk assessment is performed. The safety equipment may include, but are not limited to the following:

- First Aid Kit and Manual
- Navigational Tools (Maps, Compass, GPS, etc...)
- Personal Protective Equipment
- Communication Devices
- Extra Food and Water
- Automobile Jack
- Fire Extinguisher
- Batteries
- Allergy or other Medications
- Water Purification Tablets or Filter Devices
- Sunscreen and Hat
- Flashlight
- Spare Tire (maybe two)
- Road Flares
- Bug Spray
- Epi Pen (Physician Prescribed)

FIELD HAZARDS

A variety of field hazards can be encountered while in the field. The following recommendations and practices are provided as general guidelines to minimize or eliminate exposure and adverse health problems.

Bees and Wasps:

Bees, wasps, hornets and yellow jackets may be attracted to scented materials (body fragrances, perfumes, lotions, deodorants, and scented soaps) and food. These insects can inflict stings that can cause serious or fatal allergic reaction in some people. This is the most frequent cause of serious medical problems among field workers, after trauma, e.g., falls and vehicular accidents. If there are known or suspected allergies to these insects, a physician should be consulted to determine if special precautions should be taken.

Ticks:

There are over 13 different species of ticks found in Maine. However, the “Deer Tick” also known as the “black-legged tick”, is the principal vector of the Lyme disease spirochete in the northeastern United States. Lyme Disease is an illness caused by a corkscrew-shaped bacterium called a spirochete that is transmitted to humans, dogs, horses, and other animals by tick bites. Frequently starting with a rash and flu-like symptoms, Lyme disease, if untreated, may progress to cause arthritis and neurological problems. The first symptom of Lyme disease in humans is usually an expanding, bull’s-eye like, red rash at the site of the tick bite, which may occur within a few days or several weeks later. The rash may be preceded or accompanied by flu-like symptoms such as fever, headache, chills, nausea, facial paralysis, or pain in the muscles and joints. If Lyme disease is suspected, call your doctor immediately. Early antibiotic treatment is very effective and can prevent later, more serious complications. Not all patients develop the rash, however, and many do not recall a tick bite.

By far, the best way to avoid the misery of Lyme disease is to be aware of the risk of tick bites and to act accordingly. The good news is that deer ticks usually do not transmit Lyme bacteria until they have been attached for at least 24 hours — up to 48 hours for adult ticks. In addition, even in highly endemic areas, only 40-50% of adult deer ticks may be infected. In a recent study, no more than 3.4% of individuals seen by physicians for deer tick bites who were not treated with antibiotics eventually developed Lyme disease. Diagnosed in its early stages, Lyme disease is easily and effectively treated with oral antibiotics. The bad news is that if unrecognized and untreated, it may progress to cause arthritis and neurological problems for which treatment is more difficult. If you discover a tick attached to your body, the Maine Medical Center Research Institute has established a program that will identify ticks at free of charge.

Precautions to Avoid Tick Bites

- Tuck your pant legs into your socks and your shirt into your pants when walking in woods, brush, or tall grass.
- Deer ticks attach to clothing and then walk upward.
- Wear light-colored clothing so ticks may be seen more easily.
- Use a repellent containing DEET according to label directions -- particularly on shoes, socks, and pant legs. Avoid applying high-concentration products to the skin, especially on children.
- People who must be in areas where ticks are prevalent may pretreat protective clothing with a permethrin-containing product which both repels and kills ticks. Caution: this is not for use on skin; use only as directed on the label.
- Inspect yourself, your clothing, your children, your companion, and your pets for ticks when you get in from the field. Ticks often attach in body folds, behind ears and in the hair. If possible, shower and wash clothes immediately. Heat drying is effective in killing ticks.

Snakes:

According to the United State Food and Drug Administration, there are only three states in the United States that do not have poisonous snakes. Luckily, Maine is one of the three (Alaska and Hawaii). However, if you are bitten by a snake, you should have it looked at by a medical professional.

Bears:

According to Maine Department of Inland Fisheries & Wildlife, there are approximately 23,000 black bears residing in the state of Maine. Maine bear range covers about 26,215mi², or 86% of the State's land area, with bears present in all but the heavily settled southern and central-coastal portions of Maine. Here are some helpful tips if you encounter a Maine Black Bear:

- Remember bears are unpredictable, so avoid confrontations at all costs.
- Do not run from a bear! This may trigger a chase response. Black bear can run over 30 mph.
- Identify yourself. Let the bear know you are human. Talk to the bear in a normal voice. Wave your arms. Help the bear recognize you. If a bear cannot tell what you are, it may come closer or stand on its hind legs to get a better look or smell. A standing bear is usually curious, not threatening. You may try to back away slowly diagonally, but if the bear follows, stop and hold your ground.
- If a bear actually makes contact, surrender! Fall to the ground and play dead. Lie flat on your stomach, or curl up in a ball with your hands behind your neck. Typically, a bear will break off its attack once it feels the threat has been eliminated. Remain motionless for as long as possible. If you move, and the bear sees or hears you, it may return and renew its attack. In rare instances, particularly with black bears, an attacking bear may perceive a person as food. If the bear continues biting you long after you assume a defensive posture, it likely is a predatory attack. Fight back vigorously.

Moose:

According to state wildlife biologists, Maine's moose population is estimated at 29,000. Moose are not normally aggressive, however, they can be very aggressive in fall during rut or in winter when they are hungry, tired of walking in deep snow, or harassed by people, dogs, and traffic. Here are some helpful tips if you encounter a moose:

- Attempt to avoid the moose if possible.
- Never get between a cow and her calf.
- Try to get behind a tree if a moose charges. You can run around the tree better than it can.
- Remember, if you see its ears laid back and/or the hair on its "hump" stand up, it's angry or afraid and may charge.
- Moose can kick with their front legs as well as their back.

Rabies:

Rabies is a viral disease of the central nervous system (brain and spinal cord) that is almost always fatal. Rabies in humans is very rare in the United States, but rabies in animals, especially wildlife, is common in some parts of the country. The rabies virus lives in the saliva (spit), brain, and spinal cord tissue of animals and is spread when they bite or scratch. The virus can also be spread if saliva or nerve tissue touches broken skin or a mucous membrane in the mouth, nose, or eye.

The rabies virus can infect any mammal, but infection is most common among bats, skunks, fox, and raccoons. Rabies is very rare among rodents (squirrels, rats, mice, and chipmunks). Thanks to vaccines, rabies is extremely rare among pets and farm animals. However, a horse in southern Maine was confirmed rabid in January 1996.

If you think you have been exposed to a rabid animal, follow these steps:

1. Immediately wash the wound with soap and water, and continue washing for at least 10 minutes.
2. Seek medical attention immediately.
3. Contact your town office or local law enforcement agency.
4. Report any incident to Gates McDonald (University of Maine Worker's Compensation Administrator) by calling 1-866-466-4606.

Plants:

There are a variety of poisonous plants that can cause adverse reactions when contacted or ingested. To prevent contact exposure, learn to recognize and avoid poisonous plants. Wearing long pants and long-sleeved shirts to eliminate or minimize potential exposures. If you come in contact with a poisonous plant, carefully remove contaminated clothing and thoroughly wash the affected skin with soap and water as soon as possible. You may need to seek medical attention for extreme exposures.

WEATHER

Lightning:

Lightning can injure or kill in three ways, direct strikes, side flashes, and ground potentials. Generally, direct strikes occur when the individual is the highest object or best pathway between air and ground. It is often fatal. Side flashes are described as a portion of the energy passing through a nearby object jumps sideways and passes through the victim. Due to the high energy passing through the primary pathway, the victim may or may not be a better conductor than the primary pathway.

Examples:

Side flashes often occur when lightning is moving through a building's plumbing system or wiring. (You can be standing in the basement of a building and be struck by lightning!) In the outdoors, side flashes can occur when lightning travels through a tree trunk or fence. When a group of people standing together is struck by lightning, the tallest individual is often killed by a direct strike, and shorter individuals injured by side flashes.

Ground potentials occur when lightning strikes an object, powerful electrical potentials (voltage gradients) are established in the surrounding ground (or ice, water, etc.). This electrical current can be as many as thousands of volts per lineal foot. Ground potentials can extend tens to hundreds of feet from the struck object. Animals standing in a pasture near a tree that are struck by lightning are often killed by the ground potential between their front and rear legs.

Lightning Safety:

If you hear thunder or see lightning in the distance stop work immediately and seek appropriate shelter. Lightning can strike under a clear sky several miles ahead of an approaching storm. Most strikes that cause injury or death occur *before* the storm is overhead, even under a clear sky! Storms can travel at 45+ mph, and may follow unpredictable paths. Plan fieldwork to avoid being caught in an electrical storm. If the potential exists for thunderstorms, work in close proximity to vehicles.

The best shelter is a large, sturdy building. Small buildings or open-sided structures in the open are usually poor choices unless protected with a lightning grounding system. Always stay clear of windows. The center of a room offers the smallest probability of side flashes. A hard-topped vehicle with windows rolled up is often the best field shelter available. Avoid contact with metal components. If caught in a storm in the forest, the best protection is offered by thick growth of relatively small trees (compared to average canopy height). In open terrain: avoid trees, choose the lowest point of ground, such as a ditch or depression. However, avoid standing water, which can transmit ground potentials farther.

The Lightning Squat:

1. Body as low as possible, head bent down, hands on knees, feet together.
2. Never lie flat (ground potential danger).
3. Never stand or squat with feet apart (ground potential danger).
4. Squat alone! Ideally, individuals should be 10-20 feet apart. Never allow any part of your body or gear to touch another person or object.
5. If you feel a tingling or feel your hair standing on end when a storm is approaching, immediately assume the lightning squat!

COLD EXPOSURE

As the weather becomes "frightful" during winter months, workers who must brave the outdoor conditions face the occupational hazard of exposure to the cold. Prolonged exposure to freezing temperatures can result in health problems as serious as trench foot, frostbite, and hypothermia. Workers in such industries as construction, commercial fishing and agriculture need to be especially mindful of the weather, its effects on the body, proper prevention techniques, and treatment of cold-related disorders.

Preventing Cold-Related Disorders:

Wear a Minimum of Three Layers of Clothing

- An outer layer to break the wind and allow some ventilations (Gore-Tex® or Nylon)
- A middle layer of wool or synthetic fabric to absorb perspiration and retain insulation in a damp environment. Down is a useful lightweight insulator, but ineffective once it becomes wet.
- An inner layer of cotton or synthetic weave to allow ventilation.

Pay Special Attention to Feet, Hands, Face, and Head

- Up to 40% of body heat can be lost when the head is exposed. Footgear should be insulated to protect against cold and dampness.

Avoid Exertion

- Cold weather puts an extra strain on the heart. If you have heart disease or high blood pressure, follow your doctor's advice about shoveling snow or performing other hard work in the cold. Otherwise, if you have to do heavy outdoor chores, dress warmly and work slowly. Remember, your body is already working hard just to stay warm, so don't overdo it.

Select the Warmest Part of the Day

- Reduce the amount of activities performed outside. When employees must brave the cold, select the warmest hours of the day (10:00 am – 2:00 pm).

Remain Hydrated

- Fluid replacement is important while working in cold temperatures, because significant dehydration can occur. In addition, employees should be encouraged to eat a normal, well balanced diet.

Take breaks

- Set up a work-rest cycle for employees working outside in cold temperatures.

Cold-Related Disorders:

Hypothermia

When exposed to cold temperatures, your body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up your body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and won't be able to do anything about it.

Hypothermia is most likely at very cold temperatures, but can occur even at cool temperatures (above 40°F) if a person becomes chilled from rain, sweat, or submersion in cold water.

Victims of hypothermia are most often (1) elderly people with inadequate food, clothing, or heating; (2) babies sleeping in cold bedrooms; and (3) people who remain outdoors for long periods -- the homeless, hikers, hunters, etc.

Recognizing Hypothermia

Warnings signs of hypothermia:

- shivering / exhaustion
- confusion / fumbling hands
- memory loss / slurred speech
- drowsiness
- glassy look in their eyes

What to Do

If you notice any of these signs, take the person's temperature. If it is below 95°, the situation is an emergency – call 911!

- Get the victim into a warm room or shelter.
- If the victim has on any wet clothing, remove it.
- Warm the center of the body first -- chest, neck, head, and groin -- using an electric blanket, if available. Or use skin-to-skin contact under loose, dry layers of blankets, clothing, towels, or sheets.
- Warm beverages can help increase the body temperature, but do not give alcoholic beverages. Do not try to give beverages to an unconscious person.
- After body temperature has increased, keep the person dry and wrapped in a warm blanket, including the head and neck.

Frostbite

Frostbite is an injury to the body that is caused by freezing. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures.

Recognizing Frostbite

At the first signs of redness or pain in any skin area, get out of the cold or protect any exposed skin -- frostbite may be beginning. Any of the following signs may indicate frostbite:

- a white or grayish-yellow skin area
- skin that feels unusually firm or waxy
- numbness

A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb.

What to Do

If you detect symptoms of frostbite, call 911!

- Get into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on frostbitten feet or toes – this increases the damage.
- Immerse the affected area in warm -- not hot -- water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Do not rub the frostbitten area with snow or massage it at all. This can cause more damage.
- Don't use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator for warming. Affected areas are numb and can be easily burned.

These procedures are not substitutes for proper medical care. Hypothermia is a medical emergency and frostbite should be evaluated by a health care provider. It is a good idea to take a first aid and emergency resuscitation (CPR) course to prepare for cold-weather health problems. Knowing what to do is an important part of protecting your health and the health of others.

HEAT EXPOSURE:

As temperatures rise, so can problems related to heat. As outdoor workers, we need to be aware of how serious heat related illnesses can be and how to avoid them. If the body does not rid itself of excess heat fast enough, it cooks the brain and other vital organs. Heat stroke is often fatal, and those who survive may have permanent damage to their vital organs.

Preventing Heat-Related Disorders:

Acclimatization (to heat)

Acclimatization is a process of adaptation that involves a stepwise adjustment to heat over a week or sometimes longer. An acceptable schedule for achieving acclimatization is to limit occupational heat exposure to one-third of the work day during the first and second days, one-half of the workday during the third and fourth days, and two-thirds of

the workday during the fifth and sixth days. The acclimatization procedure must be repeated after days off due to illness or a vacation of one week or more. To achieve acclimation, a person must work in the heat at the activity level required by the job. If the risk of heat stress is increased, additional acclimatization will be required.

Fluid Replacement

Always drink plenty of water when in the heat. Simply relying on feeling thirsty will not ensure adequate hydration. To replace the four to eight quarts of sweat that may be produced in hot environments, people require one-half to one cup of water every 20 minutes of the workday. Water at 55° F is preferable to ice water or warm water

Physical Fitness

Physical fitness is extremely important. The rate of acclimatization is a function of how physically fit the individual is. The unfit worker takes 50 percent longer to acclimate than one who is fit.

Limit Exposure Time

Schedule as many hot activities as practical for the coolest part of the day (early morning or late afternoon). Employ additional help or increase mechanical assistance if possible.

Minimize Heat Exposure

Minimize heat exposure by taking advantage of natural or mechanical ventilation (increased air velocities up to 5 mph increase the rate of evaporation and thus the rate of heat loss from the body) and heat shields when applicable.

Take Rest Breaks

Take rest breaks at frequent, regular intervals, preferably in a cool environment sheltered from direct sunlight. Anyone experiencing extreme heat discomfort should rest immediately.

Wear Permeable, Loose Fitting Clothing

Generally less clothing is desirable in hot environments, except when the air temperature is greater than 95° F or a person is standing next to a radiant heat source. Then covering exposed skin is beneficial to reducing heat stress.

Heat Exhaustion:

Heat exhaustion results from the reduction of body water content or blood volume. The condition occurs when the amount of water lost as sweat exceeds the volume of water drunk during the heat exposure. Heat exhaustion usually develops after several days of exposure to high temperatures. The victim of heat exhaustion may have some or all of the signs or symptoms: heavy sweating; clammy, flushed, or pale skin; weakness; dizziness; nausea; rapid and shallow breathing; headache; vomiting; or fainting.

First-aid treatments for heat exhaustion consist of the following:

- Call 911, especially if victims faint or vomit.

- Move the victims to a cool area.
- Place them on their backs with their feet raised.
- Loosen clothing and apply cool, moist cloths to the body, or fan the victim.
- Slowly administer sips of salt water (plain water for those with heart or blood pressure problems).

Factors that may increase the risk of heat stress include sleep distress, obesity, poor physical condition, lack of acclimatization, dehydration, and alcohol use. Many commonly used drugs may also interfere with the body's response to heat stress. Preexisting medical conditions, such as cardiovascular disease, diabetes, certain skin disorders, and some diseases of the central and peripheral nervous systems, can impair people's normal physiological response to heat stress. Consult your physician for more information concerning the above conditions.

HAZARDOUS MATERIALS

1) SELECT HAZARDOUS MATERIALS CAREFULLY

- Reduce your use of hazardous materials as much as possible.
 - Hazardous materials are by definition dangerous.
 - What happens to the chemicals you bring?
- Consider doing a less hazardous field preparation, saving the hazardous work for back in the laboratory.
 - Ask yourself if you really need to do this in the field.
 - Is there a field prep protocol that is acceptable (check the literature)?

2) OBTAIN AN MSDS FOR EACH CHEMICAL YOU WILL BRING

- When you use a hazardous material a MSDS must be immediately available.
 - You may not be able to get proper medical care without the MSDS.
 - MSDS contain valuable information for Emergency Responders.
- Collecting the MSDS will help in identifying precautions needed on the trip.

3) SELECT APPROPRIATE SAFETY PRECAUTIONS

- Do you have the necessary PPE?
- Will you need an eye wash bottle or an emergency shower?
- Do the chemicals need to be stored outside the vehicles passenger compartment?
 - Could toxic fumes be released from the material?
 - Would a broken bottle volatilize and asphyxiate the occupants of the vehicle?
- Is this a chemical that should be used in a hood?
- How will you store chemicals that are incompatible?

4) TRANSPORTATION OF HAZARDOUS MATERIALS

- Material of Trade exemption applies to small quantities of hazardous materials transported for use by the carrier (i.e., gasoline for use by lawnmower service).
 - The container size limit for flammable liquids, flammable solids, corrosives, oxidizers (other than organic peroxides), poisons (not hazardous by inhalation), and miscellaneous regulated material is as follows:

- (1) 1 pound (1 pint) for DOT Packing Group I (PG I) materials, or
- (2) 66 pounds (8 gallons) for DOT Packing Group II or III materials.
- ii) Cylinder limits for non-inhalation hazard gasses is 220 pounds.
- iii) For “Dangerous When Wet” materials in PG II or III the limit is 1 ounce.
- iv) The total quantity that can be transported is 440 pounds.
- b) All hazardous materials must be:
 - i) Leak-tight (for gases and liquids) sift-proof (for solids) and securely closed.
 - ii) Packages must be stored secure from movement and protected from damage.
 - iii) Each material must be packaged in the manufacturer’s original packaging or a packaging of equal or greater strength.
 - iv) Packages must be properly labeled with a common name or proper shipping name to identify the materials it contains, including the letters "RQ" if it contains a reportable quantity of a hazardous substance.
 - v) Cylinders must have proper DOT shipping labels.
- c) The operator (driver) of the motor vehicle must be informed.
 - i) They must be aware of the presence of hazardous materials and must know whether any exceed a reportable quantity (RQ).
 - ii) They must also be aware of the DOT requirements (40CFR173.6) governing transportation of materials of trade as outlined above.

5) HAZARDOUS WASTE

- a) Hazardous wastes should not be transported from one University owned facility site to any other location! The facility where a waste is generated is where it must stay until shipped by a licensed waste transporter.
- b) The only exception is for waste, which is generated in the field.
 - i) The “generator location” for field-generated waste is the laboratory where the field operation is based.
 - ii) Used chemicals should not be labeled with “Hazardous Waste” labels until returned to the laboratory.
 - iii) If waste is accumulated then Satellite Accumulation records should be kept and the waste should be stored in properly labeled containers that are suitable for transportation (as outlined in the transportation section).
- c) If possible design your experiments so that they do not generate any hazardous waste.

6) EMERGENCY PROCEDURES

- a) Off campus emergency numbers are not all the same you must look up the local emergency number for the field site before you need them!
- b) Reporting requirements depend upon the type and quantity of spilled material:

OIL and PETROLEUM PRODUCT SPILLS

Report any Oil Spill into navigable waters which produces a visible sheen or discoloration to the National Response Center at 800-424-8802.

Report within 2 hours any oil spill of 10 gallons or more even indoors or to the sewer to the Maine DEP at 800-482-0777.

HAZARDOUS CHEMICAL SPILLS

Report within 1 hr any quantity of hazardous matter or hazardous waste spilled onto land, air, or water to the Maine DEP via the State Police at 800-452-4664.

Report immediately any spill that equals or exceeds the RQ of hazardous substance or hazardous waste spilled onto land, air, or water to the National Response Center at 800-424-8802.

Report immediately spills equal to or exceeding the RQ of an extremely hazardous substance or hazardous substance to the Local Emergency Planning Committee via the County Sheriff, and the Local Fire Department (these numbers vary by location).

Written follow-up reports are also required! (Contact EH&S for assistance).

DRIVING ON MAINE LOGGING ROADS

1) RESPECT FOR LOGGING TRUCKS

- a) The logging trucks have the right-of-way on the logging roads.
 - i) You should pull over to the side of the road when they approach you from both directions.
 - ii) Remember that the logging roads are private roads for the most part.

2) THINGS TO BE AWARE OF CONCERNING LOGGING TRUCKS

- a) They ride the center of the road, which gives them more stability in carrying their loads.
- b) They carry a tremendous amount of weight, and therefore, require much more time to stop than you do.
- c) Don't get too close to the truck.
 - i) Stones / rocks can break your windshield and lights.
 - ii) Logs and debris may fall off the truck.
 - iii) Loader arms, chains and logs may move on the truck trailer, which may strike your vehicle.
- d) On dusty roads, try to travel at a safe distance behind the truck so that you can see the whole road.
 - i) If a truck passes you from either direction, visibility is impaired – pull over to the side of the road until the dust clears.
 - ii) It may help to turn on your lights, however you run the risk of leaving your lights on after you park the truck for the day.
 - (a) Park on an incline if possible, well off the traveled way.
 - (b) Help to remind each other.

- iii) Especially on dusty roads during heavy hauling periods, trucks often travel together – or in convoys.
- iv) Never assume a truck operator knows you are there.
 - (a) Especially when overtaking a truck from the rear.
 - (b) They have a large blind spot next to the truck.
- e) The truck drivers and woods workers use radios for communications and therefore know where each other is.
 - i) Stay on the right side of the road when traveling around curves.
 - ii) Remember, trucks will ride the crown even around the curves!

3) ANIMALS AND NIGHT DRIVING

- a) MOOSE, MOOSE, MOOSE, need I say more?
 - i) Moose don't like to move off the road very quickly and often try to cross in front of the vehicle.
 - ii) The eyes of a moose do not reflect headlights as well as deer.
 - iii) Moose are dark and stand tall – making them more of a risk.
 - iv) When you see one cross the road always be alert for one or two more.

4) SAFETY AND TRUCK MAINTENANCE

- a) Make sure you have a good jack one high lift and one standard axle, with handles and lug wrench.
 - i) You should always leave with two spare tires and check them before leaving.
 - ii) Use the axel jack when possible to change tires.
 - iii) Drive the bad tire to a safe, off – road location.
- b) After the roads are graded, there are many sharp rocks uncovered which can destroy tires.
 - i) It's safer to drive slower on newly graded roads.
 - ii) Stay alert for uncovered rocks.
- c) Washouts, sink holes, culverts, frost heaves, soft spots and heaved rocks are all dangers of driving in the spring or after heavy rains. Be careful pulling over to the side of the road in the spring, the shoulders are usually very soft.

5) GENERAL SAFETY TIPS BEFORE AND WHILE DRIVING A VEHICLE ON LOGGING ROADS

- a) WEAR YOUR SEAT BELT!!!
- b) Two sets of vehicle keys, with different crew members is helpful in case one set gets lost.
- c) Always have your vehicle headed (pointed) home before you park and begin work. Don't plan to turn it around after work is done.
- d) Check unknown water holes, beaver flowages, etc. before driving through them.
- e) Don't park under snags or limbs of nearby trees.
- f) Don't leave food in such a manner that it will tantalize wildlife especially bears!

6) CHECK YOUR VEHICLE OVER BEFORE LEAVING FOR THE FIELD

- a) Check the tires (spares also), fluid levels (gas, oil, antifreeze and windshield washer fluid).

- b) All vehicles should have a first aid kit, blank injury report forms, fire extinguisher, tool box, jack (handle and lug wrench), tow rope or chain, jumper cables, gloves, flashlight, shovel and flares or markers for marking an accident or breakdown.
- c) Fire extinguisher should be charged.
- d) Make sure first aid kit is complete.
- e) Essential tools are: crescent wrench, pliers, screwdrivers (Phillips and regular), duct tape and wire.
- f) It's always safe to take a Gazetteer and compass if you'll be traveling off the main logging roads. Check town line designations as you cross them.
- g) Do a double check on the equipment you'll need in the field. Make sure the equipment is secured or fastened down in the vehicle.

PERSONAL PROTECTIVE EQUIPMENT / HAZARD ASSESSMENT

A hazard assessment must be completed to determine the presence, or potential presence, of hazards that would necessitate the use of personal protective equipment (PPE). This assessment shall be documented using the "Workplace Hazard Assessment & Personal Protective Equipment Certification" form, which can be obtained through the Department of Environmental, Health, and Safety or the College Environmental, Health, and Safety Officer.

Once the hazard assessment is completed, controls should be established to eliminate or minimize the hazards. The best method to control a hazard is through elimination. Hazards can be eliminated through several different methods by substituting chemicals, installing a local exhaust ventilation, or installing a guard. When engineering controls do not completely control a hazard or are infeasible, worker rotation and changing the task can be used to reduce employee exposure to a hazard. When all other control options have been exhausted and engineering and administrative controls are not feasible, then one may consider PPE as a last resort.

Normal Work Clothing:

Appropriate regular work attire should be chosen according to the environment and type of work to be performed. If employees are subject to having their legs, feet, and arms scraped (by rocks, thorns, tree branches, etc...) then long pants, shirts with sleeves, socks and shoes (no sandals) are required. Other factors that could affect the selection of normal work attire include temperature, biological activity (ticks and plant life), and excessive exposure to the sun's ultraviolet rays.

Eye and Face Protection:

Eye and face protection should be selected when an individual is exposed to hazards from flying particles, molten metal, liquid chemicals, gases or vapors, or potentially injurious light radiation.

Proper eye and face protection should be selected and used whenever the employee is exposed to an eye or face hazard. All eye and face protectors shall meet the requirements found in ANSI Z87.1. Approved eye or face protection will be marked with ANSI Z87, denoting that it meets ANSI standards for a particular hazard.

Hazards to Consider Include:

• Chemical Splashes	• Dust	• Smoke and Fumes
• Projectiles	• Welding	• Heat
• Glare	• Biohazards	• Tree/bush Branches

Respiratory Protection & Hearing Protection:

Selection of respirators is based upon contaminants, exposure level, and work rate. You must consult with the University of Maine Department of Environmental, Health, and Safety prior to selecting any respiratory protection. This includes voluntary and required use of respirators by University of Maine employees.

Selection of hearing protection should be based on Time Weighted Average. If you believe that you or your employees are exposed to noise in excess of 85 dBA averaged over 8 hours (or equivalent) or if you have no idea as to the noise levels, contact University of Maine Department of Environmental, Health, and Safety for a noise assessment.

Head Protection:

If individuals work in areas where they are exposed to falling objects (large enough to cause injury) or overhead electrical hazards, then the individual is required to utilize the appropriate head protection. Head protection should meet ANSI Z89.1 requirements and will be marked appropriately. Know the expiration date on your hard hat, which is located on the underside of the hat. Hard hats break down over time. Once that date has expired, replace the hard hat.

Hand and Arm Protection:

Appropriate hand protection should be selected for individuals whose hands are exposed to hazards such as those from skin absorption of harmful substances, sharp edges, severe abrasions, punctures, chemical burns, thermal burns, harmful temperatures, splinters, animal teeth, and claws.