



**University of Minnesota
Field Research Safety Program**

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I. Overview

The Field Research Safety Program is intended to provide rules and guidelines to principal investigators (PIs), research supervisors, postdoctoral associates, technicians, graduate students, undergraduate students, and other employees with the primary objective of promoting safety and minimizing risks associated with field research activities where there is an elevated risk of potential harm in comparison to routine activities. This program can be used as a guideline to academic field research where it applies.

II. Planning

A. Crew Leader

A Crew Leader must be designated for each trip. The Crew Leader may be the PI, or someone designated by the PI. The crew leader has the following responsibilities:

- Ensure every member of the crew is properly trained
- Complete the [Field Safety Plan \(FSP\)](#)
- Completed and review Standard Operating Procedures (SOPs)
- Verify communication methods
- Items are packed and in good condition
- Obtain weather forecasts and check on weather conditions periodically
- Ensure the crew is properly signed in and out
- Check-in with the Point of Contact on a regular basis
- Ensure activities are conducted in a safe manner

B. Point of Contact

A Point of Contact (POC) must also be assigned for any overnight trips. The POC is not on the trip but has access to the Field Safety Plan. This is the person who the Crew Leader must check-in with on a regular basis. If there is information that needs to be communicated to the crew, or from the crew to others not on the trip, the POC will make contact. The POC can be the Principal Investigator (PI), or someone designated by the PI.

C. Field Safety Plan

The Field Safety Plan (FSP) allows for detailed information to be documented and communicated to your crew regarding the specific site where they will be performing fieldwork. Appendix A of this program contains the FSP, and an editable document can be found on the [Field Safety Resources webpage](#). At minimum, the FSP shall include information on the following:

- Project name
- Time period of trip
- Crew Leader name
- POC name

- Team member names
- Description of work
- Location
- Site Access Guidelines (restrictions, alternate routes, etc.)
- Directions
- Communication method and plan
- Emergency phone numbers
- Emergency procedures
- Specific hazards and methods of controls (working on ice or water, with chemicals, etc.)
- Special considerations (parking, restrooms, weather, etc.)

The following personnel must receive a copy of the completed FSP

- PI
- Department Safety Officer (DSO), where applicable
- Any personnel that will need to communicate with the crew during an incident or in an emergency (POC)

Be sure a copy of the FSP that can be accessed at any time by the POC, who may need to reach the group in the event of an emergency. Be sure to communicate the location with personnel in your Department/Division. Whenever possible, the planning and execution of field activities should be a team effort in contrast to working alone.

Relating to coursework that may involve field work, a checklist located in Appendix C can be used by faculty as a guideline.

D. Water

Planning to have a source of potable drinking water during field activities is extremely important. A variety of potentially harmful organisms and pathogens live in natural water sources such as streams, lakes, and rivers. Drinking impure water can cause gastrointestinal problems and can also cause hepatitis, giardia, and certain viral diseases. Adequate water filtration or water treatment devices must be included in trip planning if potable drinking water access is limited or unavailable.

E. Travel

Plan the method of travel. If using a vehicle, be sure that the vehicle has been properly maintained and that drivers have a valid driver's license. If applicable, departmental driver training may also need to be conducted. Further requirements for drivers can be found in Part XII Driving Safely of this program.

The University's Travel Policy requires all faculty, staff, and students traveling abroad for university purposes to register their travel. [Refer to the Global Programs and Strategy Alliance](#). When travelling internationally, be sure that appropriate vaccinations have been offered, travel

methods have been clearly outlined, and that the project team has reviewed the travel plan. Document the nearest hospitals and directions on the FSP.

III. Communication

A. Supervisor and Point of Contact Notification

Every employee going into the field is required to notify their supervisor prior to departure. A simple sign-out log or another method of tracking must be kept by supervisors or PI (i.e., email notification). A copy of this tracking method must be kept with office personnel in case someone on the project needs to be contacted. In addition, there must be a system in place for employees to notify the proper personnel of their safe return (email, text, phone call, phone app, etc.). For overnight trips, the Crew Leader must check-in on a regular basis with a Point of Contact (POC).

B. Phones

In some locations, cellphones will not work. Crew leaders or PIs shall investigate to determine whether cellphones are expected to work at the project site(s) and document this information in the FSP. The FSP, including emergency contacts and phone numbers, shall be available for all team members to access.

C. Satellite Communicators

The use of satellite communicators is highly recommended to field work in remote locations especially when cellphone service is limited or not available.

Personal Locator Beacons (PLBs): Satellite-synced device sends an SOS signal to rescue agencies, along with your location. Features include:

- Works in remote areas worldwide
- Long-lasting multiyear battery life
- No subscription fees
- Does not have the ability to send messages home or cancel an SOS call
- Stronger signal than a satellite messenger

Satellite messenger: Can send an SOS signal and offers communication options. Features include:

- Works worldwide (coverage varies by brand)
- Rechargeable batteries
- Requires a subscription
- Can send/receive non-emergency messages home
- Some models allow two-way texting to coordinate with rescuers after SOS calls; this also allows you to cancel an SOS call
- Unobstructed view of sky is needed for good signal

- Can have GPS navigation features

D. Marine Radio

Marine radios can also be used as a method of communication on boats or vessels. All team members working on boats equipped with marine radios shall be trained on the operation of the radio if it might be used as a method of communication.

IV. Injury and Illness Reporting

If an employee suffers an injury or illness while working in the field, seek medical attention as soon as possible. The supervisor (Crew Leader/PI) must be notified as soon as reasonably possible so that it can be properly reported. Supervisor responsibilities upon first knowledge of injury or illness are as follows:

- Immediately assess the incident and assist the employee in seeking appropriate medical care or necessary treatment for any work-related injury. If an injury is potentially life-threatening, call 911.
- If job-related, complete the [electronic First Report of Injury \(eFROI\)](#) form within 8 business hours

Further information can be found on the [Office of Risk Management](#) website.

V. Training

Training will vary depending on the hazards and tasks that an individual is exposed to. Employees need to take the field-related courses in the Appendix D that pertain to their work activities. There may be additional courses required by regulations. If you have questions about required training, contact University Health and Safety (UHS).

Retraining is required when:

- There is a change in an SOP
- A new procedure or piece of equipment is introduced
- There is a near miss
- An incident or injury occurs

In these instances, re-training on the applicable portion of the program is required prior to the continuation of work. The PI or other responsible person must keep documentation of all field safety training.

A. First Aid/CPR

It is recommended that employees whose work assignment in the field places them beyond reasonable accessibility to a medical facility in terms of time and distance (15 minutes and/or 10 miles) should be trained in first aid/CPR. Depending on the specific college, this may be requirement. Trained employees must receive refresher training as required by the organization

providing the training (i.e., American Red Cross). First aid/CPR trained employees must also complete Bloodborne Pathogens training found in Appendix D.

VI. Standard Operating Procedures and Risk Assessment

Standard operating procedures (SOPs) must be completed when the project includes hazardous chemicals, biohazards, or there is potential for someone to get injured or ill. Templates for SOPs hazard classes can be found on the [Lab and Research Safety Document Library](#). A risk assessment must also be conducted for hazardous activities to ensure appropriate controls are being implemented to minimize risk to employees. These controls may include elimination, substitution, engineering, administrative, or personal protective equipment (PPE). A template of a general risk assessment can be found in Appendix B. Anyone conducting the procedure that includes hazardous chemicals, biohazards, equipment, etc. must be adequately trained on the SOP and risk assessment. This training must be documented and can be included with the FSP.

VII. Equipment

Emergency procedures and equipment for each field project shall be outlined in the FSP prior to each trip and reviewed with each team member. Equipment may include the following:

- [First aid kit\(s\)](#)
- Flashlight(s)
- Communication device(s)
- Spare batteries
- Maps and directions
- Compass
- GPS
- PPE/PFDs
- Field Safety Plan (FSP)

Other Items to Consider:

- Water purification tablets or filter devices
- Camping gear
- Rain gear
- Flares (not on airplane)
- Fire extinguisher (when using flammable chemicals)
- Waste collection containers/bags
- Labels
- Tie-downs
- Medications needed (each crew member packs their own)
- Sunscreen and hat
- Insect repellent
- Hand/feet warmers

VIII. Personal Protective Equipment

It is the responsibility of the PI and/or Crew Leader to determine which personal protective equipment (PPE) is required for members of the crew to utilize while they carry out research activities. PPE must be selected based on the hazards that are known or suspected to be on site. The template in Appendix B can be used to perform a risk assessment which helps document selection of appropriate PPE. PPE should never be used as a substitute for feasible engineering controls.

PPE shall be maintained and stored properly. Employees must inspect the PPE prior to bringing in the field to ensure it is in good condition. If the PPE is found to be in poor condition, discard and replace prior to the activity. Do not conduct the activity without the proper PPE.

Examples of PPE may include the following:

- Hardhats
- Eye protection (safety glasses/goggles) and face shields
- [Hearing protection](#)
- [Respiratory protection](#)
- High-visibility vests
- [Fall protection](#)
- Protective gloves
- Chaps
- Steel-toe footwear

Specific hazards may require evaluation from UHS. These may include exposure to noise and use of respiratory protection. If your project works with or near noise producing equipment or performs tasks that may have exposure to inhalation hazards, contact UHS.

IX. Weather

Work should be scheduled to avoid adverse weather. The Crew Leader must be aware of weather alerts and communicate them to the crew. This includes heavy rainstorms accompanied by lightning and wind, and snow or ice storms. All field work activities must be terminated during severe storms, and employees should seek appropriate shelter.

A. Thunderstorms

Thunderstorms can produce tornadoes, large hail, heavy rain with possible flooding, and lightning. Since lightning can strike miles away, precautions should be taken not only when you are in a thunderstorm but also when there is a thunderstorm nearby. National Weather Service (NWS) in conjunction with Minnesota counties will now issue a [WEA \(alert to your phone\)](#) for Severe Thunderstorms with winds more than 80 mph or hail greater than 2.75." Some precautions to be taken during thunderstorms are:

- Get off bridges, cable ways, exposed structures
- Get out of water and out of boats (head for shore)

- Stay away from metal and barbed wire fences
- Stay in field vehicles with doors and windows closed
- Do not use very high frequency (VHF) radio because it can attract lightning

B. Tornadoes

Tornadoes do not usually affect a large area, but they are the most violent type of storm that can occur. Large thunderstorms can spawn several tornadoes and a major outbreak of tornadoes can cause widespread damage.

Tornado Watches and Warnings: The NOAA National Severe Storms Forecast Center will issue a watch or warning to indicate when and where severe thunderstorms and/or tornadoes are most likely to occur.

- **Tornado Watch** – Be prepared. Tornadoes are possible in and near the watch area. Be ready to act quickly if a warning is issued or you suspect a tornado is approaching.
- **Tornado Warning** – A tornado had been sighted or indicated by weather radar. There is imminent danger to life and property.

Pay close attention to changing weather conditions in your area. The following weather signs may mean that a tornado is approaching:

- A dark or green-colored sky
- A large, dark, low-lying cloud
- Large hail
- A loud roar that sounds like a freight train

Actions you should take if there is a tornado in your area:

- Move to an interior room on the lowest floor of a sturdy building
- Avoid windows
- If in a mobile home, vehicle, or outdoors, move to the closest substantial shelter and protect yourself from flying debris.

C. Heavy Snowfall and Blizzards

Work should be scheduled to avoid adverse weather if possible. Consider potential travel conditions on the way to the job site. Do not travel if you are not comfortable with driving in snowy conditions. [511 MNDOT](#) can be used to track road and travel conditions throughout the state. Snow may not be predicted for the job location but may be predicted for areas in between your location and where the job is located.

If heavy snowfall is expected or likely, take the following precautions:

- Wear clothing suitable for the weather and bring dry socks
- Take a sleeping bag and small supply of water and food in the vehicle
- Take waterproof matches, a small can of gel-type fuel, some sort of wind break (blanket, sheet, or space blanket)

- Carry snowshoes in the vehicle
- Take a compass so that if you need to travel while it is snowing, you will not circle or go in the wrong direction

If caught in a heavy snowstorm or blizzard, take the following precautions:

- Stay with the vehicle until roads are passable or visibility is good
- Conserve gasoline
- Do not eat snow because of the body heat loss it will cause
- If you need water, melt snow with a heat source
- Protect parts of the body most vulnerable to frostbite
- If you are out of the vehicle and no shelter is available, dig a cave or shelter in the snow
- If you need to leave the vehicle, use a rope or some other means of being sure you do not get separated from other members of your team and that you can find your way back to the vehicle

D. Exposure to Sun, Heat, and Cold

When you work in extreme temperatures, your body needs to take time to adapt. To maintain a constant inner body temperature, the body must continually keep or gain heat in cold environments and lose heat in hot environments. There are limits to what the body can adapt to and its ability to maintain its core temperature can fail. People can adapt to hotter temperatures through a process called acclimatization. Acclimatization takes time and can vary from person to person. Under normal circumstances it can take 5 to 7 days, but it may take up to several weeks for the body to fully acclimatize.

1. Heat Stress

Special precautions must be taken to avoid heat-related illness in hot weather when working outdoors or in non-air conditioned indoor environments. People suffer heat-related illness when their bodies are unable to regulate internal body temperature. In hot weather, the body normally cools itself by sweating. Under some conditions, sweating is not enough. These conditions include high humidity, areas with limited air movement, working in direct sun, heavy physical exertion, and poor physical condition. Some medical conditions and medications can also reduce the body's ability to tolerate heat. Signs and symptoms of heat-related illness include headache, dizziness, lightheadedness, fainting, weakness, mood change, mental confusion, upset stomach or vomiting. If an employee is experiencing these symptoms, they should be taken to the emergency room or call 911 to request medical help as soon as possible.

Heat-related illness is preventable by following these guidelines when working in hot environments:

- Drink small amounts of cool water frequently, regardless of your activity level. Drink throughout the day.
- Replace salt and minerals. A sports beverage can replace the salt and mineral you lose from sweating. Avoid sodas and coffees as they will cause further dehydration.
- Wear appropriate clothing. Choose lightweight, light-colored, loose-fitting clothing.

- Protect yourself from the sun by wearing a wide-brimmed hat. Sunglasses and sunscreen (SPF 30 or higher) are also recommended.
- Schedule outdoor work carefully. If outdoor work must be done in hot weather, try to limit it to morning hours. Limit sun exposure during mid-day hours. Consider rotating outdoor work schedules among your co-workers.
- Pace yourself. Start slowly and pick up the pace gradually.
- Monitor yourself for the signs and symptoms of heat-related illness (listed below).
- Take time to cool down. Rest often in shady areas. A few hours in air conditioning can help you stay cooler later in the heat.
- Avoid working alone. When working in the heat, monitor the condition of your coworkers and have someone do the same for you.
- Monitor those at high risk. Some people are at greater risk than others due to medical conditions or from taking certain medications.
- Take time to acclimate to heat and humidity. A heat wave is stressful to your body. You will have a greater tolerance for heat if you limit physical activity until you become accustomed to it.
- The [OSHA-NIOSH Heat Safety app](#) is a useful resource for planning outdoor work.

2. Cold Stress

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing. Frostbite and hypothermia are the two most common types of cold injuries. Further information can be found in the [UHS Cold Stress Program](#).

a. Frostbite

Frostbite is the freezing of some part of the body because of exposure to very low temperatures. The face, hands, and feet are most affected by frostbite. Signs of frostbite include pale waxy-white skin color and skin becomes numb and hard.

Frostbite Prevention

Wear enough layered clothing to protect against cold and wind. Wear warm gloves, boots, and a hat. Exercise face, fingers, and toes from time to time to keep them warm and to detect any areas that may have become numb. Watch others for signs of frostbite.

Frostbite First Aid

- Seek medical attention as soon as possible.
- Move the person to a warm, dry area. Do not leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- Do not rub the affected area as this may cause damage to the skin and tissue.

- Gently place the affected area in a warm (~105 degrees Fahrenheit) water bath and monitor the water temperature to slowly warm up the tissue.
- Do not pour warm water directly on the affected area because it will warm the tissue too fast, causing tissue damage. Warming takes about 25 to 40 minutes.
- After the affected area has been warmed, it may become puffy and blister.
- The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm.

b. Hypothermia

Hypothermia occurs when body temperature falls to a level where normal muscular and cerebral functions are impaired. While hypothermia is generally associated with freezing temperatures, it may occur in any climate where a person's body temperature falls below normal. A 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 will not be able to do anything about it. The most severe state of hypothermia occurs when core body temperature falls below 91.4°F (33°C). Hypothermia can occur in water of less than 70°F.

Signs and Symptoms of Hypothermia

Symptoms of hypothermia can vary depending on how long someone has been exposed to the cold temperatures. Early symptoms include shivering, fatigue, loss of coordination, confusion, and disorientation. Late symptoms include no shivering, blue skin, dilated pupils, slowed pulse and breathing, and loss of consciousness.

Prevention of Hypothermia

Never go into the field in cold weather without adequate clothing, including a windproof, water-resistant outer jacket. Long pants, a long-sleeved shirt or sweater, a windbreaker or down jacket, and a cap are the minimal essentials. Stay dry. If clothing becomes wet from perspiration, rain, snow, or immersion, it should be changed as soon as possible. Carry a complete change of clothes in case clothing gets wet in the field. If you start to shiver in a prolonged or violent way, seek warm shelter at once.

Hypothermia Treatment

Seek medical assistance immediately. Handle hypothermic people very carefully or only as instructed from medical personnel. If the person is unresponsive and not shivering, assume they are suffering from severe hypothermia. Reduction of heat loss can be accomplished by various means including obtaining shelter, removal of wet clothing, adding layers of dry clothing, blankets, or using a sleeping bag.

For mildly hypothermic cases or those more severe case where medical treatment will be significantly delayed, external re-warming techniques may be applied. This includes body-to-body contact (e.g., placing the person in a pre-warmed sleeping bag with a person of normal body temperature), chemical heat packs, or insulated hot water bottles. Good areas to place these packs are the armpits, neck, chest, and groin. It is best to have the person lying down when applying external re-warming. You may also give mildly hypothermic people warm fluids orally but avoid beverages containing alcohol or caffeine.

X. Occupational Health Exposure

A. Routes of Entry

Employees may be exposed to health hazards in the following ways: inhalation, skin absorption, ingestion through poor hygiene practices, and injection. The most common route for contaminants to enter the body is through inhalation. It is important to understand how employees may be exposed to health hazards during their work tasks or from the environments they are working in and how to prevent or limit those exposures.

B. Exposure Assessments

Although many health hazards can be determined as unlikely or possible overexposures, some field tasks may require evaluation from UHS personnel. Groups working with high hazard chemicals, noise producing equipment, dust producing tasks, prescriptive burn operations, or any other high health hazard operation should consult with their designated research safety professional or contact UHS for evaluation.

C. Noise

There are many pieces of equipment that are used in the field or in shops that generate noise. Depending on the exposure type, frequency, and duration, employees may experience over-exposure to noise. Hazards with over-exposure to noise can include:

- Permanent hearing loss.
- Temporary change in hearing (ears may feel stuff up) or ringing in your ears (tinnitus). These short-term problems may go away within a few minutes or hours after leaving the noise area. However, repeated exposures to loud noise can lead to permanent tinnitus and/or hearing loss.
- Loud noise can create physical and psychological stress, reduce productivity, interfere with communication and concentration, and contribute to workplace accidents and injuries by making it difficult to hear warning signals.
- Noise-induced hearing loss limits your ability to hear high-frequency sounds, understand speech, and seriously impairs your ability to communicate.

D. Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, toxic gas which interferes with the oxygen-carrying capacity of blood. Carbon monoxide has poor warning properties and can overcome persons without warning. Common sources result from incomplete combustion of natural gas and any other material containing carbon such as gasoline, kerosene, oil, propane, coal, or wood. Employees may be exposed to high levels of carbon monoxide while:

- Performing prescribed burns
- Working in a gasoline-powered boat at idle or slow speeds
- Entering a well, pit, or excavation while using a gasoline-powered pump to pump out water
- Working or sleeping in an area with a portable generator or portable combustion-type heater in or near the area.
- Working in an enclosed building where a combustion engine may be idling. If equipment needs to idle or be running, this should be done outdoors.

Symptoms of carbon monoxide exposure may include headache, fatigue, dizziness, drowsiness, or nausea. During prolonged or high exposures, symptoms may worsen and include vomiting, confusion, and collapse in addition to loss of consciousness and muscle weakness. If exposure to carbon monoxide occurs, move to a well ventilated or outdoor space. Severe exposure requires immediate medical attention.

E. Respirable Crystalline Silica

Crystalline silica is a common component of many materials and can be found in varying amounts in soils. Respirable dust containing crystalline silica is known to cause silicosis, a serious and sometimes fatal lung disease, as well as increases the risk of lung cancer and other systemic diseases. Employees who are exposed to fine particles of silica from dust producing operations such as soil grinding may be at risk.

F. Pesticides

Pesticides are chemicals that are used to prevent, destroy, repel, or mitigate undesirable organisms such as weeds or harmful insects. Many university operated agricultural fields and privately owned farms are treated with pesticides at specific times of the growing season. Employees who may be exposed to pesticides in the field are required to be trained on the Environmental Protection Agency's (EPA) Worker Protection Standard (WPS). The WPS standard lays out the safe working requirements for employees that encounter pesticides in their normal job tasks and those who handle and apply pesticides. Training on WPS is required annually prior to entering an agricultural field treated with pesticides. This training can be found in Appendix D and is a component of the Field, Plot, and Greenhouse safety training module.

XI. Navigation

Some projects require navigation to very remote areas. The team must be trained and competent in using navigation methods including reading maps, using a compass, and GPS. In some cases, personnel may be working in the field when it is dark. Workers should always carry a headlamp and/or flashlight with extra batteries for night-time work. Walking or hiking at night is strongly discouraged as chances for slips, trips, and falls and encountering dangerous wildlife increases. Additional information on how to use topographic maps and compasses can be found in Appendix D.

XII. Driving Safely

When driving to or from field sites, it is important that you adhere to the following guidelines:

- Always focus your attention to driving. Distracted driving is a leading cause of motor vehicle accidents. Never send or read text messages or use the internet from your phone while driving.
- Be sure your vehicle contains all important equipment before leaving including a tow strap or in winter, an ice scraper and/or shovel.
- Be aware of the road conditions and drive accordingly. Wind, snow/ice, and rain can all affect your ability to see hazards and the road. Forest service roads are covered with gravel and sometimes have blind corners; be alert and exercise caution when passing logging trucks, and other drivers. Be sure to adjust your speed whenever driving on slippery roads or gravel forest service roads.
- If you become tired while driving, pull the vehicle over and rest at a safe place such as a rest stop, hotel, etc. Alert the Crew Leader that you will be delayed.
- Always be sure you have enough fuel for your field work, especially when you are going to be gone for more than one day. Be aware of the nearest gas station so that you can adequately plan when you need to re-fuel. In severely cold weather, be sure the gas tank is at least half full to prevent freezing.
- If you notice any maintenance issues, notify your supervisor immediately.
- If you need to trailer equipment into the field, there are special considerations that must be adhered to while driving. If you have not received training on trailer and load securement, do not attempt to trailer equipment.
- If trailering, there are additional safety considerations. Make sure the trailer is properly hitched, that all the lights work, and that everything on the trailer is properly secured. Use the buddy system when backing up with a trailer to avoid collisions.
- Anyone driving a vehicle that has a gross vehicle weight rating or gross combination weight rating of 26,001 lbs. or greater or the capacity to carry 16 or more passengers (including the driver) must be enrolled in the Department of Transportation Drug and Alcohol program. Please see the [Occupational Health program for more details](#).

XIII. General Safety for Encountering Animals, Plants, and Insects

Several animals, insects, and plants may be encountered when conducting field work. Field workers should be familiar with the species of animals they have the potential to encounter in their study

area. Follow the general guidelines provided in Appendix E to prevent exposure and close encounters with animals. Appendix F outlines specific biological hazards associated with animals and insects.

Important things to remember:

- Keep food and garbage in rodent or bear-proof containers and stored away from campsites or work areas. Food odors and debris may attract insects and animals. Bears rewarded with access to food can become habituated.
- Keep food and food residues out of tents or other sleeping places.
- Thoroughly shake all clothing and bedding before use.
- Do not camp or sleep near obvious animal nests or burrows.
- Carefully look for animals and insects before placing your hands, feet, or body in areas where pests live or hide (e.g., wood piles or crevices).
- Avoid contact with sick or dead animals.
- Wear clothes made of tightly woven materials and tuck pants into boots.
- Wear insect repellent according to instructions.
- It is a good idea to notify the crew leader of any allergies you may have.
- If you encounter an animal and experience any scratches or bites, seek medical attention, and complete an [electronic First Report of Injury \(eFROI\)](#).

XIV. Specific Field Research Operations

A. All-Terrain Vehicle (ATV), Off-Road Vehicle (ORV), and Snowmobile Use

All personnel operating ATVs, ORVs, or snowmobiles should review and follow the regulations available on the Minnesota Department of Natural Resources (DNR) website. If you will be using an all-terrain vehicle (ATV) or snowmobile for fieldwork, you should first complete the Minnesota DNR training specific for that vehicle. This training is listed in Appendix D. Off-Road Vehicles (ORV) safety guidance can be referenced on the Minnesota DNR webpage ([Off-Road Vehicle Safety](#)) and basic hands-on training should be given to new operators by an employee designated competent to do so.

Any time personnel are operating an ATV or snowmobile, an appropriate Department of Transportation (DOT) approved helmet must be worn. The vehicles must be driven at reasonable speeds and operators should be extremely cautious if traveling off a marked trail. If traveling a long distance and/or in a remote area, multiple vehicles should be used in the event one becomes disabled. Be familiar with how to load, unload, and secure the vehicles on trailers (if expected to be transporting the vehicles). Make sure to check fuel levels and conduct a pre-operational check of the equipment before leaving.

B. Operation of Agricultural Tractors and Earth-Moving Equipment

Any operation of agricultural tractors and earth-moving equipment must be performed by properly trained and qualified personnel. Requirements regarding the training, responsibilities,

and safe operation of agricultural tractors can be found in the [UMN Agricultural Tractor Safety Program](#). Any earth moving equipment (i.e., skid steer, front-end loader, etc.) requires initial training performed by a competent person or vendor with refresher training every 3 years afterward.

C. Working Near Traffic or Heavy Equipment

It is often necessary to park on the side of the road when conducting fieldwork, and often to work along or near the side of the road. The minimum requirement for roadside parking or fieldwork near the road is for all field crew members to always wear high visibility safety vests. Traffic cones may also be placed behind the vehicle and a strobe light placed on the vehicle. When conducting traffic studies or research in a roadway construction zone field personnel must follow all the safety requirements that the contractor has in place. When on a roadway construction site, a high visibility vest is required in addition to hearing protection, hard hats, and safety glasses. If the crew must work close to or with earthmoving equipment (loaders, excavators, etc.) additional training is required.

D. Watercraft

1. Prior to Operation

A properly fitted personal flotation device (PFD) must be worn when working in/on a boat, while on deck of larger vessels, or while working in, near, or over fast-moving water. In addition, successful completion of the [Minnesota DNR Boater Safety Education Course](#) will be required for all employees who will be operating a university owned motorized boat as part of their work duties. Anyone operating a watercraft must be trained and be competent on all aspects of boating: the operation, emergency procedures, trailering, towing, launching, and retrieval. For specific Minnesota guidelines on watercraft, reference the [MN DNR Boating Guide](#).

2. Emergency Procedures and Equipment for Watercraft

Call for help if you boat becomes inoperable due to collision, mechanical issues, or if someone has a medical emergency. Use your signaling devices (flares, horns and whistles, radar reflectors, safety lights, or safety flags), cellphone (if able) or send radio messages. Give the following information:

- Your location.
- The nature of distress.
- The number of persons aboard and the specific condition of any that are injured.
- Estimated seaworthiness of the boat (how long you may stay afloat).
- Descriptive details of the boat.
- Any additional information that may help rescuers.

The following emergency equipment should be located with the boat:

- **Alternate or emergency means of propulsion:** Motorized boats should carry one set of oars in the boat in the event of mechanical issues or motor malfunction. Non-motorized boats should carry a spare oar or paddle.
- **Operable navigation lights:** red and green bow lights and a white stern light when working at night.
- **Bailing Device:** An effective bailing device such as a bucket should be on board in addition to any installed electronic bilge pumps.
- **Medical and first aid kit:** A small first aid kit should be carried on all motorized vessels less than 45 feet long. Contents should be appropriate to the operations carried out on the vessel.
- **Fire Extinguishers:** The number and type of approved fire extinguishers required for motorized vessels is:

Up to 26 ft.	One B1
26-40 ft.	Two B1 or one B2
More than 40 ft.	Three B1 or one B1 and one B2
- **USCG approved visual distress signals:** Recreational boats less than 16 feet long must carry visual distress signals (VDS) on coastal waters at night. All pyrotechnic VDS must be Coast Guard approved, readily accessible, serviceable, and not past the stamped expiration date. Recreational boats 16 feet or longer must always carry VDS on coastal waters. Coastal waters include:
 - The ocean,
 - The Great Lakes,
 - Bays or sound that empty into the ocean or Great Lakes,
 - Rivers over two miles across at their mouths upstream to where they narrow to two miles.

3. Use of Paddlecraft (Canoes, Kayaks, Rowboats, and Paddleboards)

Paddlecraft such as canoes, kayaks, rowboats, and paddleboards have very different handling characteristics. They capsize easily if overloaded or improperly loaded. PI's or crew leaders must ensure all personnel operating paddlecraft are properly trained. MN DNR training for specific paddlecraft can be found in Appendix D. Important things to keep in mind:

- Never exceed the manufacturer's recommended load capacity.
- Where possible, load cargo from the side rather than over an end, with the craft floating.
- Balance the load evenly so the hull is stable and trim.
- Secure cargo to prevent shifting when the craft is underway.
- Maintain balance of the watercraft.
- Use care when entering and exiting.
- Do not stand up or make sudden movements in small watercraft.
- Exercise care in releasing and raising anchors.
- Do not schedule night travel.

E. Working on Ice

Working on ice should only be done as a last resort and the FSP must include a detailed plan of safe operations and make sure all personnel are trained on these details. There are several safety precautions that need to be taken when working on ice.

- Be sure to carry the proper safety equipment: PFD, ice pick, ice staff, rope, cellphone, or satellite communication device.
- Never work alone.
- Follow the ice thickness limits in the table below.
- Check ice thickness once you get there. You can use an ice chisel, ice auger, cordless drill, or tape measure to check thickness.
- Check the ice at least every 150 feet. Temperature, snow cover, currents, springs, and rough fish all affect the relative safety of ice. Ice is seldom the same thickness over a single body of water; it can be two feet thick in one place and one inch thick a few yards away.

Load / Situation (slow-moving) Loads	Minimum Effective Thickness
Person walking (120 kg/264 lbs.)	10 cm - 4 inches
Snowmobiles (machine and rider <500kg / 1,102 lbs.)	18 cm – 7 inches
Car or small pickup	30 cm – 12 inches
¾ ton 4X4 vehicles (max GVW of 5,000 kg / 11,023 lbs.)	38 cm – 15 inches

If you fall through the ice, it is important to not panic. Follow these steps so that you can be prepared:

1. Do not remove your winter clothing. Heavy clothes will not drag you down, but instead can trap air to provide warmth and flotation.
2. Turn toward the direction you came. That is likely the strongest ice.
3. Place your hands and arms on the unbroken surface.
4. Kick your feet and work your way back onto the solid ice. If your clothes have trapped a lot of water, you may have to lift yourself partially out of the water on your elbows to let the water drain before starting forward.
5. Lie flat on the ice once you are out and roll away from the hole to keep your weight spread out. This may help prevent you from breaking through again.
6. Get to a warm, dry, sheltered area and re-warm yourself immediately. In moderate to severe cases of cold-water hypothermia, you must seek medical attention. Failure to do so may result in serious injury or death.

F. Using Waders or Wading Safely

Constant awareness of wading dangers and weather conditions need to be maintained to avoid accidents, injury, and potentially fatal situations. Listed below are some safety guidelines that need to be observed:

- If possible, avoid wading in moving water.
- Always wear a belt on your waders. Waders without a belt pose a serious risk if they become overtopped and fill with water. If your waders do fill with water, you need to remove the waders to keep them from holding you under water.

- Do not wear boots or waders that are too tight or too loose.
- If wading into a river, determine whether the river stage is rising or falling. It is a good idea to select an object (rock, stump, mark along bank, etc.) that is just above the water surface and keep watching it to determine if the river stage is rising or falling.
- Use a wading rod to probe the stream or lakebed ahead when moving. This will help maintain balance and awareness of any drop off points.
- Keep your feet spread apart and alignment of legs parallel to the current for better stability.
- If the current becomes too great for safe wading do not turn around. The greater surface area of the front or back of the body may cause you to be swept downstream. Back out carefully, bracing yourself with the wading rod.
- Use careful judgment to determine when to wear a PFD while wading and conducting activities in moving water. If it appears possible that you may be swept into any water downstream of the wading area, a PFD must be worn. Keep in mind that water as shallow as 6 inches (15 cm) can knock you off your feet if it is moving fast enough.
- Beware of sand channels where potholes, quicksand, and scour can be hazardous.
- Beware of slick, steep banks and swampy areas.
- Watch for debris and drifting ice.
- Beware of streams with partial or thin ice cover and especially of ice-covered streams at the time of incipient breakup. Do not venture out on such ice and return another day.

If you do happen to fall into a river in a spot deep enough to cause you to be pulled downstream:

- Do not try to swim.
- Position your feet downstream and float on your back.
- Do not fight the current; work your way to the side to the shallows or slower water, using your feet to push off boulders.
- Do not try to stand until you are sure that you are out of the current and out of danger.

G. Outcrop Safety

When working on outcrops, never place yourself above another person to prevent kicking rocks or loose materials down onto others. Be aware of where others are. When breaking rocks with a rock hammer, move away from other people and turn your back to them. Warn those around you before using a hammer. Use the flat end of the hammer, not the pick end, and never use a second hammer as a chisel. Eye protection (safety glasses) and head protection is strongly recommended. Be careful and stay away from ledges, cliffs, and steep slopes.

H. Unmanned Aircraft Systems (Drones)

University personnel must adhere to the requirements of the UMN Policy [“Use of Unmanned Aircraft Systems \(Drones\).”](#) All operations must also follow the Federal Aviation Administration (FAA) [Part 107](#) and any state or local requirements. MnDOT is the state-level regulator for aircraft in Minnesota.

I. Hazardous Chemicals

Sampling procedures often require the use of chemical reagents. Safety considerations for use of chemical reagents include:

- Labels for reagents must be of indelible materials and care must be taken to separate incompatible chemicals.
- SOPs outlining test procedures must be included with testing chemicals.
- Completed JHA that covers proper safety controls and PPE to be worn.
- Safety Data Sheets (SDS) must always be available.

1. Transporting Chemicals into the Field

If chemicals must be taken into the field, the following guidelines should be followed:

- Limit the quantity of hazardous chemicals required in the field to the amount required to perform the task. This minimizes the potential for spill or exposure. Under no circumstances should the public or unauthorized individuals have access to hazardous chemicals outside of the laboratory.
- Chemical bottles must be packed in absorbent or cushioning material to prevent bumping and leakage.
- Chemicals must be placed in secondary containment.
- Chemicals must be properly labeled (chemical name and GHS hazard identifier).
- A list of hazardous chemicals and quantities, often referred to as a bill of lading, should be with the driver during transportation.
- Place hazardous chemicals or samples away from the vehicle occupants if possible. Areas in the vehicle trunk or truck bed are suitable locations.
 - Secure the containers or samples to prevent movement.
 - Keep an appropriate spill clean-up kit large enough to adequately clean up the amount of material being transported.

2. Chemical Spill Clean-Up Procedures

In the event of a chemical spill during transit or at the field site, vacate the immediate area and advise other personnel of the danger. Refer to SDSs for spill clean-up procedures and notify UHS at (612)626-6002.

3. Chemical Waste Disposal

All hazardous chemicals must be properly disposed of to avoid future exposure or environmental contamination. Persons with waste chemicals should follow the requirements of the Chemical Hygiene Plan (CHP) [Section 8.4 Chemical Waste Disposal Procedures](#).

J. Hazardous Biological Materials

Hazardous biological materials in the field may include, but are not limited to, infectious microorganisms, fungi, protozoa, parasites, and animal tissue, carcasses, blood, or feces. A risk assessment must be conducted as part of the project planning process for working with potentially hazardous biological material in the field. Please ensure that the project is

approved by the Institutional Biosafety Committee (IBC) when applicable. Considerations for planning field work involving potentially hazardous biological materials:

- Prior to field work, check CDC and MDH websites for availability of vaccine for the organisms likely to be encountered.
- Ensure all materials and equipment that are needed to safely conduct, collect, or process specimens will be available on site.
- Assess the types of PPE that will be needed on hand and ensure it is readily available. Dispose of PPE as biohazardous waste after work is completed.
- Provisions for handwashing or an appropriate hand hygiene alternative must be in place. Wash hands or decontaminate hands with hand hygiene alternative if handwashing is not available after work is completed.
- A suitable disinfectant and materials for decontamination must be available on site. Be sure to thoroughly disinfect any containers or potentially contaminated items that you plan to bring with you after work is completed. Dispose of materials used for decontamination and clean-up as biohazardous waste.
- Please seek medical attention in the event of any exposure and/or injury involving biohazardous materials. An [eFROI](#) must be completed.

Biohazardous Waste Disposal

If biohazardous waste will be generated, it must be bagged then collected in a leak-proof, durable outer container that can be secured with a lid for transport to where it will be autoclaved or picked up for processing. Any disposable sharps items must be collected in a hard-walled biohazard sharps disposal bin.

K. Specific Hazards Related to Handling Animals and Reptiles

There are field research projects that involve direct contact with rodents, wild animals, and/or reptiles. In these instances, anyone working with the specific animal and/or reptile must receive the applicable vaccinations, complete the questionnaires, etc., through the Research Occupational Health Program (ROHP) and must also receive training regarding any hazards associated with the animal/reptile. Field studies that involve killing, trapping, banding, darting, implantation of telemetry devices, or any other invasive manipulation requires IACUC approval. Training modules can be accessed through Training Hub and from the [Biosafety and Occupational Health website](#). The tables in Appendix F summarize the host or type of hazard, transmission, symptoms, and prevention methods for specific animal or reptile handling.

L. Specific Hazards Related to Handling Soils, Compost, or Manures

Soils, compost, and manures contain microbes that can cause human illness. Wear gloves and wash hands before touching your face or eating. Tetanus vaccination is highly recommended, as the bacterial spores are present everywhere in nature, especially in soils, compost, and manures. Please seek medical attention in the event of any cuts or scrapes, especially deep puncture wounds that occur while manipulating soils, composts, or manures. An [eFROI](#) must be completed and submitted online. Further information can be found in Appendix F.

Appendix A UMN Field Safety Plan (FSP)

Created for/by:	<i>Name of the research group/course/or other group</i>		
Activity:	<i>Title/description of the activity (e.g., pond water sample collection)</i>		
Location:	<i>Name of the research location (e.g., Boundary Waters Canoe Area, Lake Pepin, Itasca State Park)</i>		
Date(s) of Travel:		Date of Plan Revision:	

This template and information on field safety resources and training are available at:

z.umn.edu/fieldsafety

General Information			
Location	Latitude:	<i>XX.XX (from GPS/Map)</i>	Longitude: <i>XX.XX (from GPS/Map)</i>
Site information	<i>Type of terrain, environment, etc.</i>		
Travel to site	<i>How will you get to the site? Note any construction or hazardous conditions.</i>		
Site Access	<i>Are there any restrictions to accessing the site? Note any alternate routes, parking areas, gate controls, etc. Note if the location is isolated or remote</i>		
Environmental Hazards	<i>Describe any dangerous wildlife, insects, endemic disease, poisonous plants, etc. that you may encounter. Note intended mitigation measures</i>		
Security	<i>Is there a high risk for harassment of violence? Note intended mitigation measures. For international travel, check the U.S. State Department travel site for current alerts.</i>		
Go/No Go Criteria High Heat Procedures	<p><i>What are the conditions under which traveling to, or performing actions at the site should be altered, stopped, or canceled? e.g., heavy rains, electrical storms, snow, temperature > 100 degrees or < 25 degrees.</i></p> <p>You can establish multiple criteria levels. e.g., If temperature > 80° and humidity > 60%, 15-minute hydration breaks will be taken during each hour of work.</p> <p>Note: Minnesota law requires employers to provide training on the hazards of exposure to heat if exposures are expected to approach dangerous levels. More information on evaluating heat stress and exposure levels can be found in the resources section of the field safety website.</p>		
Expected Weather	Are there any forecasted weather events that could impact the trip?		
Drinking Water Availability	<input type="checkbox"/> Plumbed water available <input type="checkbox"/> Water cooler with ice provided <input type="checkbox"/> Bottled water provided <input type="checkbox"/> Natural source and treatment method (e.g., filtration, boiling, chemical disinfection) Describe:		
Access to Shade/Shelter	If forecast exceeds 80°, shade must be available for rest breaks. <input type="checkbox"/> Building Structures <input type="checkbox"/> Trees <input type="checkbox"/> Canopy/Tarp <input type="checkbox"/> Vehicle with A/C <input type="checkbox"/> Other Describe:		

Emergency Services and Contact Information

Local Contact	Name, address & phone # Lodging location: name, address, phone #	University Contact Not on trip.	Name, number, email. Frequency of check ins: daily, at end of workday, etc.
Emergency Medical Services (EMS)	Procedures for contacting emergency medical services.		
Nearest Emergency Department (ED)	Evacuation plan and transportation options to the nearest Emergency Department; include estimated transport time, contact information and driving directions from the site to the nearest provider of emergency medical care. Attach map with specific directions.		
Cell Phone Coverage	Primary Number: Coverage: good, spotty, none Nearest location with coverage:	Satellite phone/device	Device carried? <input type="checkbox"/> yes <input type="checkbox"/> no Type/number:
Nearby Facilities	What facilities are available at or near the site: restrooms, water, gas, public phone, store? If not, where are the nearest services along the route?		
Side Trips	Are side trips planned or allowed during free time? Before or after the planned activities? Are there restrictions, specific rules, or expected code of conduct?		

Participant Information

Field Team/ Participants	Is anyone working alone? <input type="checkbox"/> Yes <input type="checkbox"/> No; If yes, develop a communications plan with strict check-in procedures; if cell coverage is unreliable, carry a satellite communication device or personal locator beacon. Primary Field Team Leader: Name, phone number Secondary Field Team Leader: Name, phone number <input type="checkbox"/> Field Team/Participant list is attached as training documentation
Physical Demands	List any physical demands required for this trip and training/certification provided. e.g., diving, swimming, hiking, climbing, high altitudes, respirators, heights, confined or restricted spaces, etc. (consult with UHS regarding appropriate training & documentation).
Mental Demands	List any unique mental demands required for this trip, e.g., long travel days, high stress environments, different cultural norms, etc.
First Aid Training & Supplies	UHS recommends at least one trained person (with current certification in CPR and First Aid) for work at remote sites. List team members trained in CPR/first aid and the type of training received. Location and description of group medical/first aid kit: Who is carrying it, where is it stored. Brief description of contents.

Immunizations or Medical Evaluation	<p><i>List required immunizations/prophylaxis or required medical evaluation, if applicable.</i></p> <p>For information on required or recommended immunizations/prophylaxis or medical clearance related to your research protocol, contact UHS Occupational Health at (612)626-5008.</p>
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Equipment and Activities

Research Activities	<i>Provide a brief description of your field operations</i>
Field Transportation	<p><i>What vehicles will be used during field operations? e.g., car, ATV, truck with trailer, snowmobile, chartered plane, or helicopter, etc.</i></p> <p>Please review the applicable University policies regarding vehicle use including but not limited to: Using Vehicles for University Business, Use of Personal Vehicles for University Business, and Reporting Accidents Involving University Vehicles.</p>
Research Tools	<i>Briefly describe any tools or equipment that will be used during research activities. Place special attention on items that require specific training. e.g., sharps (knives, razors, needles), hand tools, chainsaws, power tools, heavy machinery, tractors, specialty equipment, firearms, lasers, portable welding/soldering devices, other hazardous equipment, or tools.</i>
Other Research Hazards	<i>Describe other potential research-associated hazards e.g., handling or shipping hazardous materials (chemical, biological, radiation, and explosives), handling animals, climbing, or working at heights, rigging; shoring/trenching, digging/entering excavations, caves, other confined spaces; drone use.</i>
Personal Protective Equipment	<p>Required—e.g., boots, safety glasses, PFDs, hardhats, etc.</p> <p>Recommended – e.g., walking sticks, gloves, long pants, hats, insect repellent, sunscreen</p>

Additional Considerations

Insurance	Review the University’s Auto Liability, General Liability, and Workers’ Compensation insurance information at the Office of Risk Management website (Please note, coverage differs for paid staff versus students)
International Activities	<p>Check with the GPS Alliance Global Operations for support regarding international travel.</p> <p>Check the U.S. State Department travel site for current travel alerts.</p>
Personal Safety & Security	Personal safety risks during free time should be considered and discussed in advance, e.g., alcohol or drug use, leaving the group, situational awareness, sexual harassment, or local crime/security concerns. Review expectations and set the tone for a safe, successful trip.

Campus Contacts

Public Safety	<p>https://publicsafety.umn.edu/</p> <p>UMPD phone numbers</p> <p>Emergency: 9-1-1</p> <p>Non-Emergency: (612)624-COPS(2677)</p>
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Clinical Services	https://ohs.umn.edu/clinicalservices Faculty/Staff: HealthPartners Occupational Medicine (952)883-6000 After hours 24/7 Care Line: (612)339-3663 or (800)284-9745 Students: Boynton Health (612)625-8400 After hours 24/7 Nurse Line: (612)625-7900
UHS	(612)626-6002, www.uhs.umn.edu or uhs@umn.edu
Report Injuries	Complete the University of Minnesota First Report of Injury form within 8 business hours after injury to ensure appropriate follow-up and Workers' Compensation coverage.

Roster and Training Documentation

PI/Supervisor:

I acknowledge that this safety plan has been prepared for field work under my supervision.

Name	Signature	Date

Field Team:

I verify that I have read this Field Safety Plan, understand its contents, and agree to comply with its requirements.

Name	Signature	Date

Attach additional resources: route/location maps, photos, equipment guides, etc.

Appendix B General Risk Assessment Form

University Health and Safety General Risk Assessment Form

PI/Lab Manager/Crew Leader _____

Title of risk assessment/work activity being assessed _____

Location of assessed activity (Campus/building/room) _____

Date of initial assessment _____

Brief description of work activity being assessed

Include brief details of stages of the process, numbers of people involved, scale of operation, duration, timing, and frequency of work (attach protocol or method if preferred)

Things to consider within the assessment

- **Equipment hazards - Storage, handling and use of equipment and materials** e.g., Tools; machinery; vehicles; manual handling; noise; work at height; electricity; fire; vacuum; high pressure; high temperature; ultraviolet; laser; vibration - List equipment and materials with significant hazards and give brief details of how foreseeable harm/injuries could occur.
- **Biological hazards - Storage, handling, use, and disposal of biological agents, intermediates, products, and waste, "any micro-organism, cell culture or human endoparasite including any which have been genetically modified, which may cause infection, allergy, toxicity and other hazards to human health". This includes bacteria, viruses, fungi, and parasites. Include routes of exposure** e.g., Blood borne infection; skin contact, skin sensitization; sensitization by inhalation; toxic by ingestion or inhalation including e.g., legionella, radiation; safety of local drinking water; food hygiene. List biological agents with significant hazards and give brief details of hazard classification and foreseeable harm/injuries.
- **Natural physical hazards - Effects of the natural environment, climate, landscape, plants, animals** e.g., Extreme weather, heat/humidity/sun/cold; earthquakes and volcanoes; mountains, cliffs, and rock falls; glaciers, snow, crevasses, and icefalls; caves, mines, and quarries; forests including fire; marshes and quicksand; fresh or seawater floods, tidal surges.
- **Environmental impact** e.g., Pollution and waste, deposition of trash, disturbance of eco-systems, trampling, harm to animals or plants.
- **Chemical hazards - Storage, handling, use, and disposal of chemical reagents, intermediates, products, and waste** e.g., Toxic by inhalation or ingestion; irritant; corrosive, flammable; explosive; oxidizing; radioactive. Include routes of exposure e.g., skin contact; skin sensitization; sensitization by inhalation; toxic by ingestion or inhalation.
- **Personal safety** e.g., Escape from fire; physical/verbal attack; disability or health problems; delayed access to personal or medical assistance; failure of routine or emergency communications; security of accommodation and support; getting lost or stranded by transport; terrorism/kidnapping/civil unrest; cultural or legal differences. List aspects of the work with significant hazards and give brief details of how foreseeable harm/injuries could occur.

Description of Hazard <small>(Only include significant hazards inherent within the task or the activity)</small>	Person(s) at risk <small>e.g., staff, students, visitors, children, unexpected persons</small>	Current risk rating			Further control measures required <small>(Where the risk rating is either high or medium)</small>	Final risk rating		
		Current control measures in place	Likelihood	Severity or impact		Risk Rating	Likelihood	Severity or impact

Person(s) completing this assessment:

(Person carrying out or managing/supervising the activity day-to-day)

Name _____ Title _____ Signature _____ Date _____

Other person(s) commenting on this assessment (where required under Faculty/Directorate arrangements)

(Lab Manager or Supervisor responsible for the activity, others involved in the decision-making process, others advising on the activity (UHS, DSO, etc.))

Name _____ Title _____ Signature _____ Date _____

Person approving this assessment:

(Person with overall responsibility for the activity)

Name _____ Title _____ Signature _____ Date _____

Review of assessment, and revision if necessary

(For continuing work: the assessment must be reviewed for each visit in a series; when there are significant changes to work materials, equipment, methods, location, or people involved; and if there are accidents, near misses or complaints associated with the work. If none of these apply, the assessment must be reviewed at least annually)

REVIEW DATE	--/--/----	--/--/----	--/--/----	--/--/----
Name of reviewer				
Signature				
No revisions made				
Changes to activity, hazards, precautions, or risks noted in text.				

Risk Matrix

The hazards identified within the risk assessment should be assigned a risk rating – this should be assigned for any control measures which are currently in place and any further control measures which will be required. Assign a value for the likelihood of an incident occurring based on the hazard from 1 to 5 and a value for the severity / impact of the hazard from 1 to 5. These should then be multiplied together to give a final risk rating.

SEVERITY OR IMPACT	5 CATASTROPHIC	5	10	15	20	25
	4 MAJOR	4	8	12	16	20
	3 SERIOUS	3	6	9	12	15
	2 MODERATE	2	4	6	8	10
	1 MINOR	1	2	3	4	5
		1 RARE	2 UNLIKELY	3 POSSIBLE	4 LIKELY	5 ALMOST CERTAIN
	LIKELIHOOD					

The Risk Score

For a hazard causing harm is calculated as follows:
Likelihood x Severity or Impact

High – Rating of 15 or greater

Immediate action is required to control and/or lower the level of risk. Exposure to the identified hazard is prohibited or severely restricted.

Medium – Rating 8-12

Urgent review of the equipment, activities, system of work within the workplace with the aim of lowering the risk to the next level.

Low – Rating of 1-6

In most cases, no further action required. Ensure the risk does not change and controls remain in place. If it is possible to reduce the risk levels further through reasonably practicable means, then this should be pursued.

Scoring Criteria

Severity or Impact	Criteria
5 Catastrophic	Fatality
4 Major	Multiple major injuries
3 Serious	Major Injury
2 Moderate	Minor Injury
1 Minor	Discomfort or minor illness

Likelihood	Criteria
5 Almost Certain	Happens on a regular basis
4 Likely	Has happened at least once in last year
3 Possible	Has happened at least once in last 2 years
2 Unlikely	Has happened once or twice in last 5 years
1 Rare	Hasn't happened in last 5 years or more

Appendix C Checklist for Faculty Classes that Conduct Field Work

This checklist is a guideline and may not include every situation that needs to be addressed.

- Tracking method in place for participants (headcount, sign out, sign in, etc.)
- Staff in home department have access to itinerary/location of field trip
- Staff in home department have contact information for faculty, TAs, or other staff leading field trip
- Are staff (faculty, TAs) appropriately experienced and/or trained for the activity?
- Environmental hazards (ice, elevation, water, heat/cold, etc.) have been identified and safety precautions communicated to students.
- Do participants meet the minimum skill, experience, and qualification requirements for the intended activities? If not, how and when will training occur?
 - Date:
 - Topics Covered:
- Necessary safety equipment is in place for local conditions including:
 - First Aid Kit
 - Sunscreen and/or insect repellent
 - Proper personal protective equipment (PPE – floatation devices, hard hats, respirators, etc.)
 - Students informed as to proper clothing or field gear (including cold weather clothing)
- Travel arrangements made
 - Consent/Permission slips (if applicable)
 - Type and number of vehicles adequate
 - Vehicles in good condition
 - Those driving have valid driver's license and insurance
 - Equipment transported can be properly stored

Additional checklist for overnight trips

- Arrangements for potable water and food have been made
- Arrangements for lodging/camping have been made
- Communication methods in place
- Emergency plan in place

Additional checklist, where applicable

- If traveling internationally, all University procedures have been followed including
 - Applicable vaccinations (depending on job duties and area visiting)
 - [Registered International Travel](#)
- [Student Travel and Education Abroad Policy](#)
- Safety Training Conducted and Documented
 - Review operating procedures, hazards, and controls that are in place for:
 - Handling, using, and/or transporting chemicals or harmful biological agents
 - Using Equipment
 - Handling animals, plants, insects
 - Contaminated soil, water, etc.
- How to use, store, and inspect PPE
- Heat/Cold stress signs, symptoms, and prevention methods
- Environmental hazards (outcrop, ice, elevation, water, etc.)
- Specialty equipment training – ATV, snowmobile, boat (operation requires MN DNR training)
- What to do in the event of an emergency

Additional Comments:

Appendix D Training for Field Workers

Topic	Frequency	Method
Field Safety Program	Once, prior to field work (all field workers)	Review of written document
UMN Field Safety Plan (FSP)	Prior to each project	Review of written document
SOPs related to the project	Prior to each project	Review of written document
Field, Plot, and Greenhouse Safety	Annually prior to any field work	Online (Training Hub)
Employee Right to Know (Hazard Communication)	Annually prior to any field work	Online (Training Hub)
Field Safety (Site/Project) Including: <ul style="list-style-type: none"> • Crew Leader Responsibility • Safe Driving • Navigation • PPE (PFDs, hearing protection, etc.) • Weather 	Once, prior to field work (all field workers)	PI/Qualified Trainer
Field Safety Specific Tasks Conducted including: <ul style="list-style-type: none"> • Wader Safety • Working on ice • Trailer/towing/launching/retrieval • Load Securement • Handling chemicals in field • Outcrop safety • Working near traffic 	Once, prior to field work (only need to be conducted if employee is exposed to the hazard)	PI/Qualified Trainer
Pesticide Safety (Worker Protection Standard)	Annually, prior to entering a treatment area	Video (pesticide worker) Video (pesticide worker – Spanish) Video (pesticide handler) Video (pesticide handler – Spanish)
Direct contact with bats, turtles, snakes, mammals, etc. (only required for those handling)	Once, prior to exposure	Research Occupational Health Program (ROHP) via Training Hub
Agricultural Tractor Operator (Practical must be performed on equipment)	Annually prior to operation	In-person (UHS delivered)
ATV (required for those operating)	Once, prior to operation	Online (MN DNR)
Snowmobile (required for those operating)	Once, prior to operation	Online (MN DNR)
John Deere Gator (UTV)	Once, prior to operation	Online (Training Hub)
Utility Vehicle Safety	Once, prior to operation	Online PPT
Motorized Boats/watercraft (required for those operating)	Once, prior to operation	Online (MN DNR)
Canoe, kayak, paddleboard safety	Once, prior to operation	Online (DNR)
Chainsaw (required for those operating)	Initially, refresher every 3 years	Contact UHS
First Aid/CPR AED (at least one crew member)	Per certification requirements	University Recwell CPR/First Aid
Bloodborne Pathogens Annual OSHA Requirement (required if you are trained in CPR/First Aid/AED)	Annually	Online (Training Hub)
Unmanned Aircraft Systems or Drones	Per FAA and University Policy requirements	Part 107
Navigation: How to use a compass	As needed	REI Outdoor Navigation
Navigation: How to read a topographical map	As needed	REI Outdoor Navigation

Appendix E Animal and Plant Encounters

Table 1: Animals











Type	Defense Action	Prevention
<p>Black Bear</p> 	<p>Never run. Move slowly, speak in a low, soft voice, and move away slowly. If attacked, fight aggressively (throw things, hitting, etc.). Try to escape to a secure place such as a car or building. Do not play dead for black bears.</p> <p>NOTE: If a grizzly/brown bear attacks, leave your pack on and play dead. Lay flat on your stomach with your hands clasped behind your neck. Spread your legs to make it harder for the bear to turn you over. Remain still until the bear leaves the area.</p>	<p>Keep food out of reach or in bear-proof containers. Carry pepper spray.</p>
<p>Cougar/Mountain Lion</p> 	<p>Face the cougar directly. Raise your arms to make yourself appear larger and speak loudly and firmly. Do not run, crouch, or lay on the ground.</p>	<p>Because of their highly secretive nature, an encounter is extremely rare. Pepper spray.</p>
<p>Moose</p> 	<p>If it has not detected you yet, keep it that way. If it knows you are there, talk to it softly and move away slowly.</p> <p>Don't be aggressive - you want to convince the moose that you are not a threat. If you think the moose is going to charge you, take cover or run away.</p>	<p>If its ears are laid back and hackles are up it is likely to charge. Most of the time, when a moose charges it is a 'bluff', or warning for you to get back - a warning you should take very seriously. Once a moose bluff charges it is already agitated. If possible, get behind something solid (like a tree or a car). If a moose knocks you down, curl up in a ball and protect your head with your arms and keep still. Fighting back will only convince the moose that you may still be a threat. Only move once the moose has backed off to a safe distance or it may renew its attack.</p>
<p>Wolf</p> 	<p>Stand tall and make eye contact. Slowly back away, but do not turn your back and do not run. Throw rocks or other objects. If they attack fight back.</p>	<p>Encounters are rare.</p>

Table 2: Plants

This table represents common poisonous plants that may be encountered in Minnesota.

Type	Description	First Aid	Prevention
<p>Poison Ivy</p> 	<p>Poison ivy is a woody perennial shrub or vine that spreads by underground runners and by seeds. It grows in all types of soil and under all conditions of sun and shade.</p> <p>Poison ivy can be distinguished from other plants by its leaves, which are always divided into three leaflets. The leaves' surfaces may be smooth or hairy, glossy, or dull. They can vary in color from yellowish-green and green to reddish green.</p>	<p>Wash exposed skin immediately with soap and cold water.</p> <p>Treat as an emergency and call 911 if the person has trouble swallowing or breathing.</p>	<p>Cover skin with long sleeves, long pants, gloves, and closed-toed shoes.</p> <p>Avoid contact with clothing and equipment contaminated with poison ivy oil.</p> <p>Always wash hands with soap and water before touching exposed skin or taking a break.</p>
<p>Poison Sumac</p> 	<p>Poison sumac typically grows into a shrub or tree about 5-20 ft. in height. Flowers may be present. They are ¼ inch across or less with 5 yellowish to greenish petals. Leaves are alternate up to 14 inches long, compound with 9-23 leaflets. Leaflets are generally lance-oblong, 2¼ to 4½ inches long, about 1 inch wide, shallowly toothed around the edges, with a short taper to a pointed tip, and rounded at the stalkless base.</p> <p>It is found at woodland edges, prairies, outcrops, along roadsides, railroads, and near shores.</p>	<p>Skin contact with the oil of a poison sumac plant leads to an itchy, burning allergic skin reaction. Poison sumac is considered more allergenic than both poison ivy and poison oak. Symptoms of a poison sumac rash appear 8-48 hours after exposure and can last for weeks.</p> <p>Wash any exposed parts thoroughly with soap and cool water. Do not use warm water, as this could cause the oils to spread. Clean all contaminated clothing, shoes, and gear with detergent several times.</p> <p>Treat as an emergency and call 911 if the person has trouble swallowing or breathing.</p>	<p>Avoid; wear protective clothing.</p> <ul style="list-style-type: none"> • Gloves • Long Sleeves • Long pants • Closed-toed shoes
<p>Poison Oak</p> 	<p>The plant looks like a leafy shrub and can grow up to 6 feet tall. In shady areas, the plant can grow like a climbing vine. The leaves usually have 3 separate leaflets, but there can be up to 9 leaflets, each about 1-4 inches long.</p> <p>In spring, the leaves can be red or green. The plant produces small flowers that are white, yellow, or green. During the summer, the leaves are green, and the plant grows berries. In late summer, the leaves turn red and orange.</p> <p>Like poison ivy and poison sumac, poison oak releases an oil called urushiol when damaged. The allergen is absorbed into your skin when you touch the plant.</p>	<p>First, you may notice some stinging, itching, and minor skin irritation. Eventually, a red rash breaks out that gets itchier as it progresses. The rash will be worse in the areas that had direct contact with the plant. Bumps will start to form and eventually turn into large blisters that ooze liquid. Within a few days, the blisters begin to dry up and form a crust.</p> <p>Wash your body well with plenty of lukewarm water and soap. Pay special attention to your hands, fingernails, and whatever skin may have touched the plant.</p> <p>Treat as an emergency and call 911 if the person has trouble swallowing or breathing.</p>	<p>Avoid; wear protective clothing.</p> <ul style="list-style-type: none"> • Gloves • Long Sleeves • Long pants • Closed-toed shoes

<p>Poison Hemlock</p> 	<p>Height: 3-8 feet</p> <p>Blooms: May-August</p> <p>Lacy, triangular leaves Smooth stems with purple spots</p> <p>Plant Identification: Poison Hemlock UMN Extension</p> <p>MN DNR Poison Hemlock</p>	<p>All parts of the hemlock plant (seeds, stem, leaves, and flower) contain active neurotoxins. Symptoms of toxicity include nervous trembling, salivation, pupil dilation, rapid, weak pulse, and eventually leading to coma or death.</p> <p>If you suspect toxicity from poison hemlock, treat it as an emergency and call 911 and the Minnesota Poison Control System immediately at 1-800-222-1222.</p>	<p>Avoid; wear gloves</p>
<p>Stinging Nettle</p> 	<p>Found in prairie and landscape plantings, woodland edges, and poorly maintained landscapes.</p> <p>Light green, upright perennial</p> <p>All parts of the leaves and stems are covered with long hairs</p> <p>Leaves are coarsely toothed or jagged on edges</p>	<p>Contact with stinging nettles results in an inflammatory reaction accompanied by temporary paresthesia, characterized by a burning or a "pins and needles" sensation.</p> <p>Washing the affected area with cool water and a mild soap usually brings relief from nettle stings.</p> <p>Treat as an emergency and call 911 if the person has trouble swallowing or breathing.</p>	<p>Avoid; wear protective clothing.</p> <ul style="list-style-type: none"> • Gloves • Long Sleeves • Long pants • Closed-toed shoes
<p>Wild Parsnip</p> 	<p>Wild parsnip may not be immediately easy to identify, as it spends its first year as a rosette before bolting into a mature plant that can grow 4 to 6 feet tall in its second year. It can be spotted by its egg-shaped leaflets with saw-toothed edges arranged in pairs along the stalk.</p> <p>The yellow flowers bloom from June through late August and are most seen along road and rail rights-of-way, and along trails.</p> <p>Wild Parsnip MN DNR</p> <p>Wild Parsnip Identification video Wisconsin Extension</p>	<p>Contact combined with sunlight can cause severe burns. Move to a shady area and cover skin to reduce further sun exposure.</p> <p>Cool and cover the affected area with a wet cloth.</p> <p>Wash with soap and water as soon as possible. Do not rupture blisters.</p> <p>Avoid infection by keeping the area clean and applying first aid antiseptic cream.</p> <p>If you are burned, seek medical attention.</p>	<p>Avoid; wear protective clothing.</p> <ul style="list-style-type: none"> • Gloves • Long Sleeves • Long pants • Closed-toed shoes

Appendix F Biological Hazards from Environmental and Animal Exposures

Exposures to infectious agents that may cause disease (viruses, bacteria, fungi, parasites, and prions) can occur while working in natural environments (soil, water, animal waste) and through handling animals in the wild.

Infections can be acquired through:

- Broken skin or injuries to skin
- Ingestion
- Inhalation
- or contact with mucous membranes (eyes, nose, or mouth)

Some infections can be life threatening. Seek prompt medical attention if you have a known exposure or any symptoms of illness appear after working in the field, even weeks later. Inform your physician about your activities and potential exposures to help them determine a diagnosis.

Immunocompromised people may be at higher risk of infections that do not usually cause symptoms in people with a competent immune system. Pregnant women may be a higher risk for adverse outcomes of some infections. [Pregnancy at Work Fact Sheet](#)

For UMN Occupational Health information visit:

[Accidental or Potential Exposure | Biosafety & Occupational Health](#)

The table below includes some more common domestic (found in the U.S.) biological hazards. The likelihood of exposure will vary based on region, seasonal weather patterns, the activities you are engaging in and the preventative measures you take.

For international travel advisories: [CDC Travelers' Health](#)

Table 1. Environmental Biological Hazards.

Environmental Diseases can be acquired from: Soil, sand, untreated water, sewage, compost, manure, animal waste and bedding		
Routes of Transmission	Prevention Measures and Actions to Take if Exposed	Associated Diseases of Concern*
<p style="text-align: center;">Broken Skin and Mucous Membrane Contact</p> <p>Broken skin is any opening in the skin caused by cuts or pokes of sharp objects cracks, abrasions, acne, blisters, sunburn, or dermatitis can allow pathogens to enter the body.</p> <p>Mucous membranes of the eyes, nose and mouth that can allow pathogens to pass into the body, even if there is no injury or broken areas in them.</p>	<p style="text-align: center;">Prevention Measures</p> <p>Keep up to date on tetanus vaccinations.</p> <p>Wear appropriate work gloves to prevent small injuries to skin on hands and nitrile gloves when collecting or handling samples.</p> <p>Wear safety glasses or face shield to prevent splashes or sprays to mucous membranes.</p> <p>Bring enough PPE to all last through all your activities.</p> <p>Bandage any previously damaged skin to keep it clean.</p> <p>Avoid touching the “working end” of equipment. E.g., the scooping end of a shovel, or sharp end of a tool.</p> <p>Wash hands often and well with soap and fresh water and always before eating.</p> <p>Hand sanitizer can be used if soap and water are not accessible in the field. (Note that hand sanitizer may not be effective against all infectious materials)</p> <p>Avoid touching mucous membranes (eye, nose, mouth) with unwashed hands.</p> <p style="text-align: center;">Exposure Response</p> <p>Clean small wounds promptly with soap and fresh water, apply antibiotic, when available, and bandage to keep area clean. If no fresh water is immediately available rinse with wound antiseptic or sterile solution.</p> <p>Seek prompt medical attention for deep puncture wounds, large lacerations and small wounds that appear infected.</p> <p>Rinse mucous membranes (eyes, nose, mouth) if a splash of untreated materials occurs to the</p>	<p style="text-align: center;">Associated Diseases</p> <p>Exposure means direct contact with broken skin, mucous membranes, or introduction through injuries.</p> <p>Anthrax Exposure to contaminated soil or animal tissue/hides (cutaneous anthrax)</p> <p>Botulism Exposure to contaminated soil (wound botulism)</p> <p>Blastomycosis Exposure to contaminated soil</p> <p>Hantavirus Exposure to infected rodent saliva</p> <p>Leptospirosis Exposure to infected animal urine/body fluids, contaminated soil, or natural water sources (especially flood water)</p> <p>Sporotrichosis Exposure to contaminated soil (cutaneous)</p> <p>Plague Exposure to infected animal tissues or body fluids (bubonic or septicemic)</p> <p>Tularemia Exposure to infected animals</p> <p>Tetanus (Lockjaw) Exposure (especially puncture wounds) to soil/dust/manure (Vaccine preventable)</p> <p>Vibriosis Open wound exposure to salt/brackish water</p>

	<p>face. with fresh water or a bottle of sterile emergency eyewash if a splash of untreated materials occurs to the face.</p> <p>Seek medical attention if any signs of illness appear in the days or weeks after potential exposure and report your activities to the physician to aid in diagnosis.</p>	
<p>Ingestion Route</p> <p>Ingestion is the accidental or intentional swallowing of large or small amounts of contaminated water or touching your food or mouth with unwashed hands.</p>	<p style="text-align: center;">Prevention Measures</p> <p>Wear nitrile gloves when collecting or handling samples.</p> <p>Wash hands well with soap and fresh water often and always before eating.</p> <p>Hand sanitizer can be used if soap and water are not accessible in the field. (Note that hand sanitizer may not be effective against all infectious materials)</p> <p>Store and prepare food away from potentially contaminated areas.</p> <p style="text-align: center;">Exposure Response</p> <p>Seek medical attention if any signs of illness appear in the hours, days, or weeks after potential exposure and report your activities to the physician to aid in diagnosis.</p>	<p style="text-align: center;">Associated Diseases</p> <p>Anthrax Ingestion of contaminated water/food or infected meats that are undercooked (gastrointestinal anthrax)</p> <p>Baylisascaris Ingestion of the parasite eggs found where racoons defecate. (Racoon latrine sites-attics, flat surfaces -logs, rocks, tree stumps)</p> <p>Botulism Ingestion of contaminated food or cross-contaminated foods (foodborne botulism)</p> <p>Campylobacteriosis Ingestion of contaminated water or food, undercooked foods.</p> <p>Cryptosporidium Ingestion of contaminated water or food, undercooked foods. Touching mouth with contaminated hands.</p> <p>Giardiasis Ingestion of contaminated water or food</p> <p>Leptospirosis Ingestion of water/food contaminated with animal urine/body fluids</p> <p>Salmonellosis Ingestion of contaminated water or food, undercooked foods. Touching mouth with contaminated hands after handling infected animals.</p> <p>Shigellosis</p>

		<p>Ingestion of contaminated water or food (lake/river water)</p> <p>Shiga Toxin-producing E. coli Infection Ingestion of contaminated water or food</p> <p>Toxoplasmosis Ingestion of contaminated water or soil</p> <p>Tularemia Ingestion of contaminated water</p> <p>Vibriosis Consumption of raw oysters/seafood</p>
<p>Inhalation Route</p> <p>Inhalation of airborne dusts that contain pathogens can cause disease.</p>	<p>Prevention Measures</p> <p>Wear appropriate respiratory protection during activities that create dust, especially in abandoned structures, caves or mine shafts.</p> <p>Respiratory Protection</p>	<p>Associated Diseases</p> <p>Anthrax Inhalation of contaminated dusts (inhalation anthrax)</p> <p>Blastomycosis Inhalation of contaminated dusts</p> <p>Hantavirus Inhalation of dust from rodent nests, aerosolized urine, dropping or saliva</p> <p>Histoplasmosis Inhalation of spores from disturbed soil that is contaminated.</p> <p>Plague Inhalation of aerosolized droplets from infected cat (pneumonic)</p> <p>Q Fever Inhalation of contaminated dusts from infected goats/sheep/cattle feces, urine, milk, birth products</p> <p>Sporotrichosis Inhalation of spores from the environment (pulmonary)</p> <p>Tularemia Inhalation of contaminated environmental dust</p> <p>Valley Fever (Coccidioidomycosis) Inhalation of contaminated environmental dust</p>
	<p>Exposure Response</p> <p>Seek medical attention if any signs of illness appear in the hours, days, or weeks after potential exposure and report your activities to the physician to aid in diagnosis.</p>	

***This is not a complete list of all potential infectious agents found in these environments. Always check with local health authorities for endemic and seasonal hazards and unusual outbreaks that you need to be aware of.**

Table 2. Animal and Reptile Biological Hazards.

Bites and Scratches from Living Animals		
Routes of Transmission	Prevention Measures and Actions to Take if Exposed	Associated Diseases of Concern*
<p>Animal and Reptile Bites and Scratches</p>	<p style="text-align: center;">Prevention Measures</p> <p>Be wary of wild animals that seem “friendly” or are out during the day but considered nocturnal as these can be signs of rabies infection. Wild animals should be afraid of you.</p> <p>Pre-exposure rabies vaccination may be offered to those at high risk of exposure through the University’s Research Occupational Health Program (ROHP).</p> <p>Wear appropriate work gloves to prevent small injuries to skin on hands when handling animals and reptiles and nitrile gloves when collecting or handling samples.</p> <p>Bring enough PPE to all last through all your activities.</p> <p>Bandage any previously damaged skin to keep it clean.</p> <p>Wash hands often and well with soap and fresh water often and always before eating.</p> <p>Hand sanitizer can be used if soap and water are not accessible in the field. (Note that hand sanitizer may not be effective against all infectious materials)</p> <p>Avoid touching mucous membranes (eye, nose, mouth) with unwashed hands.</p> <hr/> <p style="text-align: center;">Exposure Response</p> <p>Flush bites and scratches for 15 minutes with fresh water and seek medical attention. If no fresh water is immediately available rinse with as much wound antiseptic or sterile saline solution you can until you can get to fresh water.</p> <p>Seek prompt medical attention for all encounters with animals that may be carries of rabies even if the wound is small. You may need Rabies Postexposure Prophylaxis (PEP)</p> <p>When should I seek medical attention? Exposure Rabies</p> <p>Seek medical attention if any signs of illness appear in the hours, days, or weeks after potential exposure and report your activities to the physician to aid in diagnosis.</p>	<p style="text-align: center;">Associated Diseases</p> <p>Rabies Infected animal (mammal) bites or exposure to direct saliva contact with broken skin/wounds or mucous membranes. All mammals can become infected with rabies but the most common in the U.S. are bats, racoons, skunks, and foxes.</p> <p>Hantavirus Rodent bites (saliva contact)</p>

Arthropod Bites/Stings	Prevention Measures	Associated Diseases
Bees Ticks Mosquitos Fleas Flies	<p>Bring medication if you have an allergy to bees. Keep scented foods and meats covered.</p> <p>Select an appropriate insect repellent.</p> <ul style="list-style-type: none"> • EPA Guidance • REI Expert Advice <p>Wear permethrin-treated clothing.</p> <p>Avoid areas with long grass when possible.</p> <p>Wear light colored, long sleeves and pants to make spotting ticks easier.</p> <p>Tuck your pants into the top of your socks or boots to create a "tick barrier."</p> <p>Check for ticks often so they can be removed promptly. They must be attached to transmit disease; crawling ticks do not spread disease. Time from attachment to transmission of disease varies from minutes to hours depending on the exact microbe involved.</p>	<p>Anaplasmosis Bites from infected blacklegged (deer tick) and the western blacklegged tick.</p> <p>Babesiosis Bite from infected blacklegged (deer tick)</p> <p>Ehrlichiosis Bite from infected blacklegged (deer tick) or lone star tick</p> <p>Lyme Disease Bite from infected blacklegged (deer tick)</p> <p>Plague Bite from infected fleas (bubonic)</p> <p>Powassan Virus Bite from infected blacklegged (deer tick), squirrel tick or groundhog tick.</p> <p>Rocky Mountain Spotted Fever Bite from infected American dog tick, Rocky Mountain wood tick, brown dog tick</p>
	<p style="text-align: center;">Exposure Response</p> <p>Bees: Remove the stinger quickly. Place an ice pack and elevate to heart level. Use an antihistamine, if able and needed.</p> <p>If there are signs of a systemic allergic reaction, treat as an emergency and call 911.</p> <p>Ticks: Remove attached ticks promptly.</p> <ul style="list-style-type: none"> • Grasp by the head close to the skin • Pull outward slowly, gently, and steadily and • Wash the area with soap and water <p style="text-align: center;">Tick Bite: What to Do</p> <p>Seek medical advice if any parts of the tick remain in the skin, or if any symptoms of illness appear in the days or weeks after tick or mosquito bite.</p> <ul style="list-style-type: none"> • Rash • Fever • Fatigue • Headache • Muscle pain • Joint or swelling or pain <p>If possible, preserve the tick between layers of clear tape to help with identification of species. Some tickborne diseases are very serious (deadly) if not treated early.</p>	<p>Tularemia Bite from infected ticks or flies</p> <p>West Nile Virus Bite from infected mosquitos</p> <p>Additional resources: Tickborne Diseases - Minnesota Dept. of Health Mosquito borne Diseases - Minnesota Dept. of Health</p>

***This is not a complete list of all potential infectious agents found in these environments. Always check with local health authorities for endemic and seasonal hazards and unusual outbreaks that you need to be aware of.**