FIELD RESEARCH SAFETY

ENVIRONMENTAL HEALTH AND SAFETY
Alabama A & M University

Field Research Safety Introduction

General Introduction
All science, whether conducted in a controlled indoor laboratory or in an outdoor field setting, requires regular safety training and thorough consideration of safety issues specific to individual research projects. The office of Environmental Health & Safety exists as a safety consulting resource for Alabama A&M University departments and personnel. Also available are several examples of safety protocols, guidelines and procedures developed by various units within the college to help in the formation of safety protocols for particular projects or activities. Ultimately, safety rests with each individual. Individuals are responsible for their own safety and, through their actions, the safety of those around them.

Introduction to Field Safety
Field research is defined here as comprising work activities conducted primarily for the purpose of research, undertaken by employees or students of the university outside of an office or research laboratory. Ultimately, field research involves some risk from both the research activities and chance events that are unpredictable and unavoidable. Part of the risk can be greatly reduced by awareness of hazards and exercising good judgment. Risk in field research may include, but is not limited to, the risk to physical health, emotional well-being and personal safety. The risks may arise because of the nature of the research itself, from the physical climate, or from the political, social, economic and cultural environment of the fieldwork location.

For these guidelines, the following definitions are employed:

- A principal investigator (PI) is a faculty member who assembles a team to carry out field research.
- A field supervisor is a person appointed by a principal investigator to directly oversee field research on location.
- A field worker is a person who carries out research under the direction of a field supervisor.

Solitary field research activities in remote areas are strongly discouraged. Two or more people should conduct Field research involving particularly hazardous locations or activities and only after full assessment of the risks and available controls and safety procedures has been made. In circumstances where solitary field research is necessary, the solitary field worker assumes the responsibilities of field supervisor. A method of regular communication should be implemented, including steps to follow if a scheduled contact is not made.

Every field researcher has the right, at any time, to refuse to participate in any activity that they feel may endanger their health or safety or that of another person.

Safety Issues for Principal Investigators

Introduction

When in the field, the principal investigator bears the same responsibilities as a field worker and may take on the responsibility of being the field supervisor or may choose to leave the regular field supervisor in charge. When not in the field, the principal investigator should make a reasonable effort to ensure that the people for whom they are directly accountable work in compliance with this field research safety policy and are provided with the necessary safety training and equipment.

Oversight

The principal investigator is responsible for:

- Aiding the field supervisor with determining the specific health and safety risks and the level of risk associated with the particular field project.
- Approving the composition of the field team and establishing a clear chain of responsible team leadership that is understood by all participants.
- Providing a pre-trip planning session that includes a briefing on the specific nature of the trip, a review of the Safety Plan and a post-trip debriefing session.
- Documenting that each field worker is aware of the provisions of this policy, the risks of the particular project, and the appropriate controls and safety procedures in place.
- Documenting that each field worker is made aware of the specific risks associated with the field research and the specific requirements for participation (e.g. safety training, visas, immunizations, health insurance requirements) and, where applicable, obtain written, informed consent from the participants or a completed, signed waiver from all volunteer participants in the field research.
- Ensuring that the appropriate controls and safety procedures are implemented, including the provision of appropriate protective equipment, procedures and training, to deal with the risks as far as is reasonably practicable.

Safety Issues for Field Supervisors Introduction

The field supervisor bears the same responsibilities as a field worker. In addition, the field supervisor is responsible for safety planning in advance of field research, as well as implementation of safety protocols on-site. At all times, the field supervisor must exercise good judgment and take all reasonable care to protect the personal health and safety of participating team members. A field supervisor must assess the risk, as far as possible, which may vary in accordance with weather, project activities, and the experience, age, fitness and other characteristics of the persons involved in the field research.

Preparation

A field supervisor is expected to have all of the suitable technical training for doing field research. In addition, some safety training is required. As a minimum, Red Cross first aid training is recommended for all field supervisors. Additional safety training, such as river rescue, may be needed depending on the field research. The following factors should be considered in development of a Safety Plan for each project.

- *Scheduling:* To the extent possible, field research should be planned in advance. The principal investigator should know when a group is doing field research. If the principal investigator is away, then the department staff should be advised of pending field research.

- *Protective clothing and equipment:* A properly equipped first aid kit, a mobile telephone, and extra water are required on all field excursions. In addition, university policy requires attention to protective clothing and equipment. Details are provided in Alabama A & M' University's Hazardous Communication Program, EH & S (revised April 2005).

- The typical weather for the season of the field research should be assessed and reported to field workers. If weather conditions are bad, be prepared to cancel or modify part or all of the field trip as necessary for safety.

- *Phone numbers:* The home phone number of all field workers and the supervisor, as well as phone numbers of emergency contacts, should be included in the Safety Plan maintained by the field supervisor. The home and work phone numbers of the principal investigator and department chair should be obtained and used in case of emergency.

- *Medical facilities:* The telephone number, location and directions to a medical facility in the vicinity of the field site should be written into the Safety Plan maintained by the field supervisor.

- *Vehicles:* Most fatal field research accidents are related to vehicle travel. All state and local laws, rules and regulations must be followed. Defensive driving should be practiced. Drivers should switch at the first sign of fatigue, or, if alone, should stop when too tired to continue safely. University vehicles must not be used for personal or recreational purposes.

- *Land access:* Permission should be sought for entry onto private land and clearly no damage should take place. Attention should be paid to local warnings, no trespassing signs and danger signs.

Conduct during field research
The field supervisor must ensure implementation of the controls and safety procedures established by the principal investigator, ensure that the team members use the appropriate safety equipment and follow appropriate safety procedures and medical precautions, conduct ongoing risk assessments during the field research and report any new hazards to the principal investigator, deal with and resolve any safety concerns which arise in the field, and maintain regular contact with the principal investigator and/or departmental contact wherever/whenever possible.

Post-trip evaluations
After field work is completed and a trip ends, the field supervisor should inform the principal investigator in a timely fashion of all substantive incidents that occurred in the field. Using hindsight, the field supervisor should revisit the Safety Plan for the project and amend it as needed to enhance safety.

Safety Issues for Field Workers Introduction

The primary responsibilities of a field worker are to show up for a project fully prepared and be mindful of safety issues while working. While the field supervisor provides all safety protocols for field research, field workers should consider all aspects of their health and training and decide individually whether the research is safe enough for their participation. Any task that appears to be unsafe should be brought to the attention of the field supervisor or principal investigator during preparation for the activity. If a field worker fears injury in performing an assigned task, they should not do it.

Preparation
To adequately prepare for field research, a field worker should understand what the specific field research project entails and what safety concerns may arise. The field supervisor should provide each field worker with a written description and must provide an oral description of the project, including the general location where work will be conducted, the weather that is anticipated, the tasks to be performed, and the specific clothes and gear the field worker must bring to the job.

Field workers must provide the university with evidence of a satisfactory state of health and immunization status. Any physical limitations that might put the field worker at risk must be made clear to the field supervisor. Any medications that need to be taken during field research, as well as their side effects, must be made clear to the field supervisor.

Conduct During Field Research
Field workers must carry out the tasks assigned to them by the field supervisor using the appropriate protective equipment provided and following the specified procedures. Activities that put individuals or others at risk during field work are forbidden.

Post-trip Care
Workers are responsible for personal hygiene matters after field work is completed.

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A. Vehicular Hazards	**General advice:** Wear a seatbelt, secure all loads, and drive defensively at safe speeds. Do not drive if you are impaired (medication, illness, emotional distress) or if you are not confident of your ability to drive under certain conditions (i.e. inclement weather, rough or muddy roads). It's better to call someone to come get you. Inform yourself about the conditions. Inform others where you will be going and for how long.	
1. Other Vehicles	Expect the following to occur at any time: logging trucks (or other vehicles) moving at high speed and/or coming over in your lane, oncoming mobile homes taking up part of your lane, tailgating (or other aggressive driving), sudden stops by vehicles in front of you, intoxication or impairment of other drivers. Be aware of the locations/behavior of other drivers, use caution when near them or when entering/leaving roadway, drive defensively and at safe speeds, warn other drivers of your intentions through the use of signals.	
2. Paved Roads	Drive slowly and carefully on wet roads, avoiding sharp or sudden maneuvers. If ice is on the road, the same applies, but with increased caution. Begin coming to a stop sooner than under normal conditions and stop more gradually. Avoid sudden, sharp accelerations. If the ice is severe, the roads may be closed. Call the highway patrol to make sure.	
3. Unpaved Roads	**General advice:** these roads are often narrow and rough. Watch for oncoming traffic and move or pull over to give them room (as much as safely possible). Approach curves and hills or any other situation where your view is obstructed with caution. Remove limbs or large loose rocks from road when possible. Avoid potholes or other road hazards that may make you lose control of your vehicle. Be well-practiced in performing three point turns. Avoid going off the road when making turns, if possible. Make sure that where you are backing up is free of obstructions. Have someone outside the vehicle to direct you, if possible, especially when turnaround is difficult.	
a. Gravel	Gravel is an unstable driving surface because it can roll and shift under the tires. Do not exceed speeds of 25mph; use caution on hills and curves. Avoid accelerating/stopping suddenly.	
b. Mud	Mud is slippery and unstable; the same cautions as for gravel apply. In addition, you can get stuck in even apparently firm soil. Avoid driving through mud puddles. Especially if you do not know how deep they are or how soft the bottom is. If you get stuck, spinning your wheels only digs out the hole that you are in deeper. Try placing rocks, bark, etc. under the tire to provide traction (make sure they are not sharp). If that doesn't work, call someone to help get you out. If you have a winch, you can attach it to a tree and winch yourself out.	
c. Rocks	Rocks can hang up or damage your vehicle. If you are driving where the road is rocky, put your wheels on the high places. Exit and visually inspect any particularly prominent rocks, shelves, or steep areas. Avoid driving on shifting rocks. Build up low places on road and even out sharp drop-offs with tightly packed rocks. Remove loose hazardous rocks from the roadway, or go around. Rockslides can also occur in some areas, so be alert in likely or posted areas.	
4. Off-road	You may be required in some cases to drive, turn, or park off-road. Avoid driving in bush-hogged areas, these have sharp sticks. If you are going to pull of the road and park, make sure where you are pulling off is not steep, unstable, muddy, or otherwise hazardous. Make sure you do not block logging access or gates.	
5. Trees	Trees can fall across the roadway or onto your vehicle. Use extreme caution in areas with the sign "Killer Trees" posted. Use caution during windstorms, especially in or near pine stands. If a tree is blocking the only way out, call someone to come help you, or, if you are trained/authorized to use a chainsaw/axe, remove the obstruction from the road. Do not attempt to shift, carry, or cut trees if they are too large/heavy for you to do so.	
6. Animals	Animals often occur frequently in specific areas or habitats along the road. Note where you have seen animals previously or where you might expect animals (fields, esp. cultivated), and use caution in those areas. Be aware of other drivers, they may stop suddenly when they see animals or you may not be able to swerve to avoid animals. If you hit a large animal (deer, etc.), try to protect your face and head in case the animal comes through the windshield.	
7. Bad Weather	Severe storms in the area can generate many hazards. Among these are torrential rain, lightning, tornadoes or straight-line high winds, flooding, ice/snow/hail, and fog. Torrential rain and fog can limit visibility and make it more difficult for you to judge your speed. High winds can blow your vehicle around or blow objects against your vehicle. Downed power lines are also a risk during high winds or ice storms, and the same is true for falling trees/limbs. If water is over the road, you may not know how deep it is or whether the road is washed away. Be aware of forecasts for bad weather. During inclement weather, consider staying put or pulling off to the side of the road. Seek shelter in the event of a tornado, if no shelter is available, abandon your vehicle (strong tornadoes can move tractor-trailers) and make yourself as small and low as possible (lay in a ditch), and keep your head protected.	
8. Getting Lost	Know how to use a compass/map. Study maps/route beforehand. Carry maps with you. Call someone to ask for directions, if necessary. Stop to orient yourself, if necessary. Don't try to read maps while driving.	
B. In the Field	**General Advice:** It is better not to work alone, but if you must it is especially vital to follow the following procedures (required of everyone): Carry a communications device and spare batteries. Follow signing in/out procedures. Inform at the very least the principal investigators/researchers and the office staff of where you are going (Block#, Treatment#, GPS coordinates of the stand, etc), how long you will be there, and when you will be checking in with them. Familiarize yourself with who to call in case of emergency. Inform your spouse, family, or roommates about who to call if you are missing. Bring sufficient food, supplies, and water for the length of time spent in the field.	
1. Terrain	**General Advice:** Be aware of terrain hazards. Always watch where you walk. Plan the safest routes to follow as you are walking. Wear comfortable, breathable footwear that provides traction and protection for your ankles, instep, and toes. If you injure yourself in the field: Evaluate whether you are fit to walk and/or drive. Do not walk/drive if: you have a head injury (esp. with dizziness/loss of consciousness), spinal (neck/back) injury, impaired vision, broken bones, torn ligaments, dislocations, or significant bleeding. If you injure yourself such that you cannot or should not walk/drive, call for help, if possible. If you can walk, move very carefully back to your vehicle/first aid kit.	

Terrain cont.	Have first aid applied (or apply it yourself) and evaluate your condition to determine whether or not you should go home/headquarters or a hospital. If you cannot call for help or are unsuccessful, stay put, and make yourself as comfortable/safe as possible within your ability.
Steep Slopes/ Drop Offs	Examine your topo map for possible steep slopes and drop offs. Avoid and be aware of drop offs. Negotiate steep slopes with caution or circumvent them. Use trees or a walkingstick to provide additional stability. Be alert for vertical cave shafts/sinkholes.
.Slippery Areas	Leaves, mud, and loose rock can be extremely slippery, especially when wet. Avoid such areas if possible. If unavoidable, walk slowly and carefully.
:Impediments	Stumps, logs, rocks, and holes can cause you to trip or lose your footing. Keep an eye on the ground as much as possible.
d.Water	Cross water carefully. Avoid immersion as hypothermia could result. Avoid gullies and dry streambeds during flash flood watches/warnings.
2. Weather/ Climate	General Advice: Be aware of the weather forecast for that day as well as the climate of the area during that time of year. Have a plan/preparations for sudden weather changes or bad weather. (Weather forecasts are not always accurate.)
a.Storms	Avoid fieldwork during storms. Seek shelter during storms. If unable to seek shelter, make yourself as low to the ground as possible, avoiding forested areas, and try to keep warm and protect yourself from flying debris.
:.Extreme Heat	The heat stress index is related to both heat and humidity. In this part of the country there is almost always high humidity (≥60%) during episodes of high heat. If the temperature is between 78-82°F, fatigue is possible with > 60% humidity with exertion and prolonged exposure. Between 82-88°F, with exertion and prolonged exposure heat cramps and heat exhaustion can occur. Heat cramps and heat exhaustion are likely and heat stroke is possible between 88-94°F. Heat stroke is likely with exertion and prolonged exposure in temperatures above 94°F. Susceptibility varies with one's physical condition, frequency/duration of activity, and level of acclimatization. Be aware of the symptoms of heat exhaustion and heat stroke, drink plenty of fluids (with electrolytes), and rest as often as necessary. Heat stroke is an EMERGENCY condition requiring medical assistance.
:.Extreme Cold	Dress warmly in layers. Be aware of the wind chill factor. Monitor extremities/face for frostbite, and keep skin adequately covered. Avoid overexertion and maintain adequate fluid intake.
1.UV Exposure	Be aware of the UV index. Wear sunscreen, cover exposed skin, wear sunglasses
2. Vegetation	General advice: Never assume an area is safe, even if you have been there previously. Forests are dynamic systems and danger levels can change at any time.
Falling Objects	Entire trees, particularly those infested with pine beetles can fall over. Watch out for "Killer Trees" signs. Be aware of the tree fall risks for the area in which you are working. Be especially cautious in periods of high winds. Dead branches and pinecones can also fall and cause injury.
b.Sharp Vegetation	Use caution when following someone else. Be considerate of those behind you. Branches caught and released while walking can cause injury. Use caution when moving/turning your head as branches may scratch your eyes. Avoid thorny vegetation, embedded thorns can cause infection. Learn to identify honey locust trees. These trees often drop large thorns that can pierce shoe soles and tires.
c.Poisonous Vegetation	Learn to recognize poison ivy, oak, and sumac. In addition to dangers from skin contact, smoke from burning these plants is extremely hazardous. Other plants can also cause contact dermatitis, although risk varies among individuals. Know your level of susceptibility and avoid plants in accordance with your tolerance level.
3. Animals	General advice: Unless you are familiar with handling/approaching animals, leave them alone.
a.Stinging/ Biting Insects	Learn to recognize yellow jacket nests, wasp nests, hornet nests, fire ant nests, and wild bee nests. Check everything you sit on, turn over, dig up, strike, move, or open. Swarming or congregating insects should as a general rule be avoided. If you have an n allergic reaction to a stinging insect, then you need to seek medical attention immediately. If you know that you have an allergy, carry an emergency kit and wear a medical ID tag. To avoid being bitten by mosquitoes, ticks, and chiggers, wear an insect repellant with DEET. Inspect yourself each day (or more frequently) for ticks and remove them carefully. Some spiders can carry necrotic bacteria/toxins. Watch for rashes, blackening/bruising, pus, and foul odors, if ticks or spiders have bitten you.
Disease Vectors	Ticks and mosquitoes can carry disease (see above for instructions). Avoid drinking water from local streams, lakes, and ponds. It could contain toxins, bacteria, and Giardia.
c.Poisonous Snakes	Learn to recognize poisonous snakes. Handling/disturbance of all snakes should be avoided, because most snakes are either mildly venomous or carry dangerous bacteria in their mouths. Turn over rocks, logs, etc carefully. Never put your hands where you cannot see them. Wear snake chaps or protective boots, if possible. If bitten by a venomous snake, call for help and be aware of first aid procedures.
.Large Animals	Any animal can become violent when it is cornered, ill, protecting young, or in rut. Even deer have been known to attack people. Be aware of animal activity. Maintain a respectful distance between yourself and animals whenever possible. It is not beyond possibility that feral hogs could attack you. Running is not an option, unless you are right next to a vehicle/building. Try to remain as non-threatening as possible. Bluffing (making yourself appear larger and aggressive) may work in some cases with some animals, but probably not with wild hogs. Fighting some animals defensively may just make them angrier and prolong the attack. If you can't run, bluff, or fight, curl up on the ground and protect your head and neck as much as possible. Seek medical attention if you are injured. Some animals carry rabies, particularly, bats, raccoons, and skunks. If you suspect that an animal with rabies may have bitten you, wash the area with soap and water and obtain the post infection series of rabies shots.
4. People	Be cautious of strangers. Be aware that you may encounter people who are intoxicated, who will harass you because of your race/sex/etc., or who are violent and/or engaging in illegal activities. Maintain your freedom of movement and your ability to call for help. Remain calm, confident, and nonconfrontational. Call for help or law enforcement if necessary.