KENT STATE UNIVERSITY

Manual of Field Safety

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Are accidents really accidents?

Studies show that in almost every "accident", human mistakes, whether made at the moment of the incident or days or weeks before, were a major contributor.

Studies also show that proper attitude, training, and gear make a difference in reducing field accident rates and severity.

INTRODUCTION AND DISCLAIMER

These procedures and policies are in place for three reasons. First, it is the right thing to do. Ensuring the safety of all in our department and those who work with us is of paramount importance. Secondly, field work and recreation are more enjoyable when there are no safety incidents; a field trip is considerably less pleasant if ended with a trip to the emergency room. Third, all industries, state and federal agencies, and most field-based organizations have mandatory safety policies and procedures, and safety should be part of any workplace culture. Starting now will help you begin developing the ethic of safe practices.

Working in the field should be a safe, enjoyable and very rewarding experience, as long as a few basic and sensible precautions are taken. Geological fieldwork is an activity involving some inherent risks and hazards, such as in quarries, mines, river sections and mountains. Severe weather conditions may also be encountered in any season, especially on mountains.

Geological fieldwork involves some level of risk; one part of this may come from chance events that are unpredictable and little can be done about it. Another part of the risk, however, can be greatly reduced by awareness of hazards and good judgment based on experience. Persons undertaking field work must assess the risk, as far as possible, and this will vary in accordance with weather, topography and other conditions on the day and the experience, age, fitness and other characteristics of the people doing the work. No person is advised or recommended here to undertake geological field work in any way that might place them in unreasonable risk from cliffs, ledges, rocks, sea or other causes. Individuals and leaders should carefully consider the safety aspects on the occasion of their visit and in bad conditions be prepared to cancel or modify part or all of the field trip as is necessary for safety. Appropriate safety and first-aid equipment should be taken, and, ideally, mobile phones should be available. Permission should be sought for entry into private land and clearly no damage should take place. Attention should be paid to weather warnings, local warnings and danger signs. No liability for death, injury, damage to, or loss of property in connection with a field trip is accepted by providing this information.

TRAVEL INSTRUCTIONS AND GUIDELINES

We will abide by all KSU and state rules and regulations.

Driving and Vehicle Safety

- Seat belts save lives. Everyone must be buckled before the vehicle moves.
- Only authorized drivers will drive KSU vehicles.
- Drivers should take breaks as often as needed.
- Ensure that there is a passenger list in the vehicle.
- Always check to make sure that all passengers are present before leaving a field trip stop.
- NO ONE may drink and drive.
- WE WILL obey the speed limits, and drive according to the weather, road conditions, etc.
- NO use of cell phones while driving.

- NO texting while driving.
- Park the vehicles away from any potential source of fire, such as dry grass.
- All participants and drivers should identify who has keys before we go out into the field.
- We will often be in areas where cell phone coverage is spotty or non-existent. We will try to determine where coverage occurs and have emergency plans based on this.
- NO one should take a vehicle without consent of an instructor, or without communicating a plan to the instructor; THE ONLY exception is in the case of an emergency
- One of the most frequent driving issues that occur in field classes are small incidents in parking lots, campgrounds, etc. These can be avoided by having other people watch for obstacles, people, and other vehicles, particularly when backing up.

Vehicle Fire Safety: *If there is a vehicle fire, what should I do?*

- Get yourself and all others out of and away from the vehicle. Be aware of traffic and pedestrian activity and warn them away from the vehicle.
- DO not try to save equipment or personal belongings, just get out.
- If there is a fire extinguisher in the vehicle, take it with you as you exit the vehicle. Even if you cannot use the fire extinguisher, it may be useful to emergency responders that arrive on scene.
- Never put yourself in danger using a fire extinguisher.
- Fire extinguishers must be appropriate for the type of fire.
- Only trained persons should try to control a fire. *Do not attempt to use a fire extinguisher unless you have been properly trained to do so.*
- If you use a fire extinguisher, follow the procedures given during your training and only do so from a safe distance and always have a means to get away.
- After you are a safe distance from the vehicle, call 9-1-1 or the local emergency telephone number. Tell them the location of the fire and follow the instructions of the dispatcher.
- Remain away from the vehicle: *do not attempt to get back into a burning vehicle to retrieve personal property.*
- Do not open the hood or trunk if you suspect a fire under it. Air could rush in, enlarging the fire, leading to injury.

The dangers of motor vehicle fires are often overlooked. Each year, these fires kill over 600 people and injure thousands more.

FIELD SAFETY POLICY AND INFORMATION

It is essential that every effort be made to reduce our exposure to risk.

Assumption of Risk

All classes, programs, and extracurricular activities within the University involve some risk, and certain ones involve travel. The University provides opportunities to participate in these programs on a voluntary basis. Therefore, students should not participate in them if they do not care to assume the risks. Students can ask the respective program leaders/sponsors about the possible risks a program may generate, and if students are not willing to assume the risks, they should not select that program. By voluntarily participating in classes, programs, and extracurricular activities, a student does so at his or her own risk.

NOTE: IF AT ANY TIME ANY behavior on the part of ANYONE in or teaching the class poses a level of risk that you are not comfortable with, you have the right to bring this behavior to the attention of the instructor.

SAFETY IN THE FIELD IS EVERYONE'S RESPONSIBILITY. STUDENTS ARE EXPECTED TO ACT RESPONSIBLY AT ALL TIMES.

Potential Sources of Risk and Procedures

The following is a list of procedures and risks associated with field geology. This list is not all encompassing, but it represents our best estimate of potential issues. It encompasses driving, field work, environmental, and food risks.

1. **Safety comes first.** No project or data is worth your life. The question, "Can I do this safely?" should always be foremost in your mind. If you have any doubts, STOP immediately, evaluate the situation, and then determine a safe procedure. If none exists, do not continue the project or work. Return home and discuss the project and safety concerns with your supervisor.
2. **Field safety training.** All participants are required to read and understand the KSU Department of Geology Field Safety Policy and materials.
3. **Plan for safety before you go into the field.** Think about the terrain (cliffs, sand, deserts, fast water, slot canyons, etc.), environment (plants and animals), season (hot, cold, rain, snow, etc.), roads and trails (how will I get out if a road washes out?); will the roads become impassable if it rains?), and your own physical condition and health. Check the weather forecast – how cold will it get at night at the elevations where I will be working? Is rain or snow possible? How far away will I be from my vehicle? Consider all these factors, and then make sure that you have adequate training and skills to handle any situation that might arise. Read manuals and information on the area and hazards. Decide how you will respond and what gear you might need. Check your safety gear before you go into the field. Prepare for the worst weather and conditions you might encounter.
4. **Plan your work carefully**, bearing in mind your experience and training, the nature of the terrain and the weather. Be careful not to overestimate what can be achieved.
5. **Discuss safety concerns with your supervisor.** If you are concerned about any situation you might encounter or feel that you do not have adequate training or experience, discuss your concerns with your supervisor before you go into the field.

6. **Safety procedure when in a group.** Most trips will be conducted in a group setting.

   a. Remember to be aware of where other students are at all times. AVOID CLIMBING above other students, or on any outcrop that provides a large potential of hazards.

   b. Field groups will be assigned for both learning and safety. Please be aware of where your group members are at all times.

   c. Do NOT go out of sight for long periods of time. Instructors continually count heads, and if we cannot find you, we will begin to look for you.

   d. We will not tolerate risky behavior in the field. Any willful behavior that endangers oneself or other students is cause for the student to be sent home at his/her own expense.

   e. Water, first aid equipment, and some emergency supplies will be placed in each field vehicle, and for most of the class, vehicles (or designated vehicle) will be left open so that these items are immediately accessible.

   f. When camping overnight, establish a common base camp for all groups. Also, attempt to camp as close to habitation as possible.

   g. Have a good sense, without invading privacy, of the abilities of everyone in your group. Are there people who are out of shape? From lower elevations? Overweight? Any health issues?

7. **Working ALONE in the field requires extra precautions. Designate an adult Contact Person before working alone in the field. Working alone should be avoided if possible.** There is no such thing in life as a totally risk-free situation and it is astonishing how easy it is to become incapacitated e.g. by a badly twisted ankle, even in apparently "safe" countryside. If another person is present, it is extremely rare for such incidents to become potentially dangerous. Your contact should be a reliable adult (your spouse, colleague, or a good friend) who will monitor your status in the field, who you will contact frequently while in the field to assure them of your safety, and who will initiate a search if one is needed. In any case, Geology faculty will act as the contact if needed. NEVER leave without leaving word with someone.

   a. BEFORE leaving for the field, WRITE OUT a clear action plan (verbal information is seldom reliable when someone is worried or upset). Decide <u>together</u> each step or procedure each of you will follow – and when. Be clear on details. **Uncertainty leads to inaction** – if your contact person is unsure of your intent, location, or check-in time, he/she will hesitate to initiate a search. Your plan should include:

      i. Where you are working. Be as precise as you can. Leave an accurate <u>detailed</u> map. Leave GPS coordinates if possible.

      ii. Give the contact person all possible information on how they can locate you while you are in the field (your cell number, motel info, etc.) and the name and phone number of the USU main office and your supervisor.

      iii. A specific time when you will check in with the contact person. For example: Some geologists will call home each evening before 10 p.m. If you will be camping or otherwise outside of phone range, tell the person when you will be able to contact them again.

      iv. A specific time when the support person should initiate a search. This should be several hours after the initial check-in time to leave a buffer for a broken-down vehicle, dead cell-phone batteries, or some other non- serious problem – you do not want your contact person calling the sheriff for minor problems. For example: your contact person could initiate a search if you have not checked in by 12:00

o'clock (noon) the day after you fail to check in. Many field geologists agree that noon is the ideal time for your contact person to initiate a search. It gives you time to get yourself out of non-life-threatening fixes in the daylight, and to check in. But it still gives the sheriff's office time to mobilize a search with enough daylight left to have a chance of finding you. Psychologically, it is much easier for an injured person to survive if they know that help is on the way.

v. The steps your contact person will follow if you do not check in by the agreed upon time. For example: (1) Call the nearest land manager, etc. where you are staying – have them look for a vehicle (2) Call the main office or your supervisor to see if they have any information (generally this will be near the middle of the day on a weekday). (3) Finally, if the contact person cannot contact you or the USU supervisor, they should call the sheriff of the county in which you are working and give them all the information they can. From that point the county sheriff will decide how to respond.

b. Follow your plan! Check in with your contact person daily. If you forget to check in, you will probably have a Sheriff's Search and Rescue Team looking for you.

8. **Do not work alone in high-risk situations.** A buddy system is not required for normal backcountry fieldwork. However, some situations do require a field companion. These include: work involving boats or travel on or next to deep water, work in any areas with known or suspected higher-than-normal crime rates, work in unusually remote locations, work in very hot or very cold weather, and work that requires technical climbing, rappelling, or very steep terrain and any other work with higher-than-normal risk (additional safety training or skills verification may be required). The companion does not have to be another geologist; instead, they just need to be an adult that can help you in case of a high-risk situation. The field worker should determine if any such risks exist and discuss any concerns or requests for a field companion with his/her supervisor. **When working alone, double your margin of safety.**

9. **FIELD WORK IS NOT AN EXTREME SPORT!** Have a safe attitude. We live in a society where people are encouraged to "push the limits." A risk-taking attitude is probably the single largest contributing factor in most accidents. This attitude leads directly to injuries and deaths. Get rid of this attitude before you go.

10. **Choose the safe option.** Yes, it may take longer, but hike around the cliff rather than trying to climb over it. Hike up the stream bank to a better crossing rather than crossing in fast water. Do not venture out on steep slopes above cliffs. When lightning threatens – head down and to shelter immediately. Do not try to accomplish "one more task" before it gets dark.

11. **Always be prepared to keep yourself alive overnight.** If you are out alone (sometimes even in a group) and incur any kind of problem – lost, broken leg, trapped on a cliff, severe illness, etc. – it is almost certain that you are going to have to spend the night out. Many poorly prepared people have died in the first night from exposure.

    When wet and/or injured hypothermia becomes a very real danger at moderate temperatures.

12. **Carry appropriate gear.** Carry everything you need to assure your own safety and survival (see separate lists). When hiking away from vehicles, carry a personal Survival Kit. You can make up a good kit that weighs about 1 pound that could keep you alive in many situations (see separate list). Practice using the items ahead of time – can you really build a fire when it's raining, you are shaking, and your hands are ice cold?

13. **Carry a cell phone, satellite phone, or personal locator beacon.** Know how and when to use it. Make sure it is fully charged. If a regular cell phone, know where it will be within

range, and where it will not be. At least one member of any field group should have one of these three items and know how to use them. Remember, once activated, a personal locator beacon signal cannot be retracted, so a search will be initiated – activate it only in a true emergency (but if it is an emergency, don't hesitate – waiting too long may cost lives).

14. **Know what to do in an emergency** (e.g., accident, illness, bad weather, darkness). Know the international distress signal: six whistle blasts, flashlight flashes, or waves of a light-colored cloth, repeated at one-minute intervals.

15. **Carry extra water and purification tablets.** When hiking away from vehicles, carry enough water to survive for 2 or more days. Always arrive back at your vehicle with water left in your bottle. Always keep extra water in your vehicle – 1 or more gallons per person depending on the situation and season of the year. Carry a few purification tablets in your survival kit. Know where to find water in your field area.

16. **Carry a first aid kit.** Know how to use it. Take first aid and CPR training and refresher courses regularly. Consider taking wilderness first aid training. The first aid kit should contain a large trauma bandage, emergency food, (chocolate, protein bars, glucose tablets), a survival bag (or large plastic bag), a whistle, flashlight, map, compass and watch. Know how to use these products.

17. **Carry safety gear.** The following safety items: pepper spray (can help against bears, cougars, or aggressive people), first aid kit with added trauma bandage, and emergency mylar blanket can be extremely helpful when in the field. The participant should take these to the field, especially on all hikes away from the vehicle, and provide additional personal safety gear needed for each field situation.

18. **Wear and carry proper clothing.** Each participant is required to provide all needed apparel (field clothing, coats, hats, gloves, boots, waterproof outerwear) that is appropriate for any weather or situation the participant could encounter. Purchase high- quality apparel from a reputable supplier. Assure that all apparel is tested and recommended by the manufacturer for the situations you could encounter – the field is not the proper place to find out that your "waterproof" jacket is really not waterproof.

    a. Wear a safety helmet (preferably with a chinstrap) when visiting old quarries, cliffs, caves, scree slopes, etc., or wherever there is a risk from falling objects. It is obligatory to do so when visiting working quarries, mines and building sites.

    b. Wear safety goggles (or safety glasses with plastic lenses) for protection against flying splinters when hammering rocks or chisels.

    c. Avoid hammering where possible; be a conservationist.

    d. Don't use one geological hammer as a chisel and hammer it with another; use only a soft steel chisel.

    e. Avoid hammering near another person or looking towards another person hammering. Do not leave rock debris on the roadway or verges.

19. **Keep yourself physically fit.** Know your own health and your own limitations. This is another of the main factors in many outdoor injuries and deaths. The problem started because of poor personal physical condition. For example: weak heart led to heart attack, poor fitness prevented hiking as far as planned, fatigue led to poor judgment, poor conditioning led to severe illness, bad knees or ankles led to slips and falls, etc.

20. **Leave a margin of safety.** For example: leave an extra hour of daylight to get back to your vehicle; leave high ridges before the thunderstorm gets there; do not climb up a ledge or cliff just because you "think you can make it."

21. **Hunting safety.** While the large majority of hunters are safe and responsible, a small

number are not. The highest risk is during rifle deer season when the most hunters are in the field with long-range rifles. Seasons vary significantly across the region – determine if hunting season is open in the area you will be working. If possible, avoid going to the field during open rifle seasons. If you do need to go to the field, wear "hunter orange" clothing – at least a vest and hat – while outside of your vehicle. Avoid areas where hunters tend to concentrate. Be respectful of hunters by: 1- talking to hunters in the area – ask them where they plan to hunt and to be aware that you are in the area; 2- avoid their "focus" areas – game trails, watering holes, open meadows, etc.

-hunters often spend several hours setting up a hunt and one person walking through the area can ruin all their work; 3- in short, do not interfere with the hunt (regardless of your personal views) – an irritated hunter is not a good thing.

22. **Water safety**

    a. Stream crossings, when necessary, should be executed with the utmost care. If water craft are used, personal flotation devices (pfds) MUST be worn.

    b. Obtain local information about tides and currents. Pay particular attention to tidal range. For sea cliffs, local advice can be obtained from HM Coastguards. Always wear footwear when wading in rivers, lagoons or on the shore.

    c. Take special precautions when working offshore. Small boats should normally be used only with an experienced boatman or colleague.

23. **Creature Safety.** Avoid all contact with animals, insects, and other creatures. NO snake playing!!

24. **Food Safety.** Attempt to keep a clean and sanitary food preparation area for safety. However, there are always risks associated with food.

25. Environmental Safety

    a. Take special care near the edges of cliffs and quarries, or any other steep or sheer faces, particularly in gusting winds. Ensure that rocks above are safe before venturing below. Quarries with rock faces loosened by explosives are especially dangerous.

    b. Avoid working under an unstable overhang.

    c. Avoid loosening rocks on steep slopes.

    d. Do not work directly above or below another person.

    e. Never roll rocks down slopes or over cliffs for amusement.

    f. Do not run down steep slopes.

    g. Beware of landslides and mudflows occurring on clay cliffs and in clay-pits, or rock falls from any cliffs.

    h. Never pick up explosives, or detonators from rock piles; if found, inform the management immediately.

    i. More accidents to geologists, including fatalities, occur along rocky shorelines than anywhere else.

    j. Do not enter old mine workings or cave systems unless it has been approved as an essential part of the work. Only do so then by arrangement, with proper lighting and headgear, and never alone. Ensure that someone on the surface knows your location and expected time of return. Be sure to report after returning.

    k. Rock-climbing, caving and scuba diving may be useful in research activities but are dangerous for the untrained or ill equipped. They should only be undertaken with the

prior approval of the supervisor.

l. Take special care near the edges of cliffs and quarries, or any other steep or sheer faces, particularly in gusting winds.

m. Ensure that rocks above are safe before venturing below. Quarries with rock faces loosened by explosives are especially dangerous.

n. Take great care when walking or climbing over slippery rocks or rocks below the high-water mark on rocky shores. More accidents to geologists, including fatalities, occur along rocky shorelines than anywhere else.

o. Beware of traffic when examining road cuttings.

p. Railway cuttings and motorways are generally not open to geologists, unless special permission has been obtained from appropriate authorities.

26. **Environmental Consideration.** Be conservation – minded and have a sympathetic regard for the countryside and great outdoors, and for the people, animals and plants that live there.

a. Do not collect specimens unless required for serious study.

b. Do not hammer outcrops casually or in-discriminately.

c. Do not disturb living plants or animals.

d. Do not leave litter, including rock chippings.

e. Observe conservation requirements.

27. **DRIVING – THE BIGGEST RISK!** Statistically, driving and riding in a vehicle are the highest-risk part of fieldwork. Follow all state and KSU rules. Do not drive while fatigued or distracted. If you are tired after a long day in the field, it is better to camp or get a motel room then make a long drive home. If you are unsure of your driving skills on rough mountain and desert roads, discuss the situation with your supervisor before going into the field. Be alert to changing weather conditions that could turn a dry road into a dangerous situation. **See "Travel Instructions" Section for more information.**

28. When working in groups, have a plan for keys for vehicles. If a part of your group needs to drive out, hiding keys near the vehicle avoids losing time finding the person with the keys.

a. Get phone numbers of team members.

b. Make a Google map of the nearest hospitals.

29. For classes, it is strongly recommended that everyone wear safety color vests or shirts.

NOTE: Many tasks and projects require additional safety procedures not covered by this manual. These include: (1) underground work in mines, caves, or tunnels; (2) work in trenches, near open-pit mines, on mine tailings, and on or near other human-made structures or deposits; (3) work on or near drill, construction, and other active work areas; (4) work involving many types of motorized or manually operated equipment; (5) use of ATVs; and (6) operating motor vehicles. Discuss these situations with your supervisor and obtain appropriate training BEFORE working on projects or entering sites involving any of these types of situations.

SAFETY EQUIPMENT YOU SHOULD TAKE TO THE FIELD

In your daypack:

1. safe attitude
2. cell phone or satellite phone or personal locator beacon w/ manual
3. trauma bandage
4. emergency mylar blanket/sleeping bag
5. aspirin
6. water purification tablets
7. insect bite ointment
8. pepper spray (can help against bears, cougars, or aggressive people)
9. personal first aid kit (see "First Aid Kit" for more information)
10. personal survival kit (see "Survival Kit that Weighs About a Pound")
11. proper clothing, boots, outerwear for worst possible weather
12. water and food
13. Simple first aid kit

In the car:

1. shovel (large)
2. small hand ax
3. tow strap
4. jumper cables
5. 3 types pliers
6. 1 – 6-way screwdriver
7. two emergency reflective mylar sleeping bags
8. first aid kit with supplies, booklet, knife, etc. (see "First Aid Kit") Also – ALWAYS check vehicle, jack, jack handle, lug wrench, spare tire

FIELD SAFETY CHECKLIST

Complete Before Each Trip to the Field. Modify According to Own Needs

☐ Studied Field Safety Policy and Information Manual
☐ Did a safety evaluation of this project or trip to the field – what are the risks?
☐ Prepared for hazards/risks I could encounter on this trip
☐ Completed KSU Hold Harmless Form (copies kept in Geology Dept. Office)
☐ Made a written emergency plan with my adult Contact Person
☐ Have cell phone or satellite phone or personal locator beacon
☐ Have personal first aid kit (and checked contents)
☐ Have personal survival kit (and checked contents)
☐ Have vehicle kit (and checked contents)
☐ Have good personal field clothing
☐ Have proper weather-appropriate outerwear and boots
☐ Have medications or other personal needs
☐ Did personal check of field vehicle:

- tires in good condition, check air
- jack, jack handle, lug wrench, spare tire has air and good tread

Some possible risks to plan for (take time to read/research about how you could handle or prepare for these situations):

- driving safety to/from/in field
- fatigue
- driving back country roads
- heat related concerns
- cold related concerns
- drinking water needs
- lightning
- weather changes
- cliffs, steep slopes, ledges
- deep or fast water
- bears, cougars, moose, etc.
- insects – allergic reaction
- insects – diseases
- snakes, scorpions, etc.
- poisonous plants
- illness/food poisoning
- altitude sickness
- lost, delayed
- surviving overnight if caught in outdoors
- falls, sprains, breaks
- personal health (heart, knees, back, etc.)

Human encounters:

- verbal confrontations
- assault/aggression
- robbery/car jacking
- stumbling upon crime
- hidden drug crops

First Aid Kit

It is essential that participants take first aid kits with them in the field. There should be a portable kit as well as one with extra supplies in the vehicles. A traditional kit will include the following[1]:

- 2 absorbent compress dressings (5 x 9 inches)
- 25 adhesive bandages (assorted sizes)
- 1 adhesive cloth tape (10 yards x 1 inch)
- 5 antibiotic ointment packets (approximately 1 gram)
- 5 antiseptic wipe packets
- 1 blanket (space blanket)
- 1 breathing barrier (with one-way valve)
- 1 instant cold compress
- 2 pair of nonlatex gloves (size: large)
- 2 hydrocortisone ointment packets (approximately 1 gram each)
- Scissors
- 1 roller bandage (3 inches wide)
- 1 roller bandage (4 inches wide)
- 5 sterile gauze pads (3 x 3 inches)
- 5 sterile gauze pads (4 x 4 inches)
- Oral thermometer (non-mercury/non-glass)
- 2 triangular bandages
- Tweezers
- First aid instruction booklet

It should also include the following non-prescription drugs:

- Aspirin or non-aspirin pain reliever
- Anti-diarrhea medication
- Antacid
- Syrup of Ipecac (to induce vomiting if advised by Poison Control Center)

[1] As recommended by the American Red Cross.

What Should Be in Your Daypack When Doing Field Geology

1. Survival kit – put in a small nylon or ziplock bag. Make sure it is always in your backpack. Replenish it as needed. Everything in a good kit can weigh under 1 pound (see separate list).
2. First aid kit with trauma bandages.
3. Water -- 2 quarts per day on cool fall days; 3-5 or more quarts per day on hot summer days. Depending on location, also consider water filter, purification tablets. Never arrive back at the car with an empty water bottle.
4. Detailed map. Review it before you need it.
5. GPS (Never rely on a GPS unit as my only means of finding my way). If you do rely on a GPS, make sure you have extra batteries.
6. Compass. I like to keep a small one in my survival kit just in case I'm not carrying my Brunton compass that day.
7. Waterproof headlamp and extra batteries. A headlamp is much better than a flashlight because it leaves your hands free. Should be good quality. Batteries in LED lights last much longer, but the beam range is limited.
8. Extra food. About 1000 - 2000 calories in high-energy bars, candy bars, etc.
9. Clothes and outerwear for the worst weather you might encounter if you get caught out overnight. Be prepared for rain, sleet, snow, wind, or severe cold. Make sure all clothes are high-quality synthetic fiber that insulate even when wet; DO NOT wear cotton. COTTON KILLS! Depending upon conditions, consider:
    a. Warm hat is a must, even in summer
    b. Sun hat that protects face, neck, and ears
    c. Warm gloves
    d. Dry warm socks
    e. Thermal underwear (high-tech synthetic fabric is lightweight, compact, and very warm for size)
    f. Waterproof coat and pants; GoreTex or other breathable waterproof fabric
    g. Fleece jacket and pants
    h. Rain hat
    i. Rain coat and pants; or poncho
    j. Small first aid instruction booklet

Also consider:

1. Safety glasses (we are geologists who break rocks)
2. Extra prescription glasses
3. Special medicines or needs; for example: allergy "epi" pen
4. Sunglasses
5. Sunscreen and lipscreen
6. Insect repellent and/or headnet
7. Toiletries
8. Sanitary handwipes or antibiotic waterless hand cleaner

SURVIVAL KIT THAT WEIGHS ABOUT A POUND

(compiled from many sources by Grant Willis, Utah Geological Survey, March 7, 2005)

Keep in a small nylon or Ziplock bag. Make sure it is always in your backpack. Replenish often. Together, everything here can weigh about a pound.

1. Mylar emergency sleeping bag. Like the standard "emergency blanket" but shaped like a sleeping bag, making it easier to seal out cold breezes.
2. Wind and waterproof matches. The best ones are from REI and burn even in a strong wind. Seal in a waterproof container. Make sure the striker is included. A magnesium stick is a reliable fire starter, but they take a lot of work and are difficult to use when your hands are cold.
3. Fire starter. Several kinds are available or make your own. Try them out and find the one you like the best.
4. Multi-function pocket knife. Small but good quality. Leatherman or Swiss Army knife. Not a cheapo version.
5. Compass. Make sure North is easy to read.
6. Flashlight. One of the tiny LED lights is a good backup to the larger headlamp thatyou should have in your backpack. Make sure the ON button is protected from accidental pressure.
7. Loud whistle. Nobody can yell for very long. A good one has a tone that carries a long distance.
8. A few heavy-duty Ziplock bags. For emergency water, to keep hands dry, etc.
9. A large sheet of heavy-duty aluminum foil. Can form an emergency cup or a small pan to heat water over coals (do not use over hot flame).
10. Small length of sturdy cord.
11. Small roll of duct or adhesive tape.
12. Large sheet of fluorescent orange plastic.
13. Small amount of high-energy food or candy. Coffee, tea, or bouillon packets are good for making a hot drink that also restores salt and gives a psychological boost.
14. Water purification tablets.
15. Small reflective signal mirror.
16. Paper and pencil stub.
17. A few sanitary handwipes.
18. Elastic ace bandage. Can give a sprained ankle enough support to walk out or secure an emergency splint or bandage.

Also consider:

19. Small wire pocket saw (helps when gathering wood in emergency).
20. Large garbage bags (emergency rain poncho or shelter).
21. Big and small needle and strong thread (dental floss works as a strong light thread for repairing equipment).
22. Wire.
23. Safety pins.
24. Candle.
25. Mole skin or other blister preventative.
26. QuikClot (high tech powder to stop severe bleeding). aa. Small Sterno can or other micro-stove with fuel.
27. Map of work area.

SOME OUTDOOR INJURY FACTS

Field work is relatively safe

- For example, in a 2003 report, England reported that out of 7 to 10 million people involved in outdoor programs, they had just one death.
- An Outdoor Adventure Organization reported that the risk of injury in outdoor adventure programs is about equal to insurance sales (wilderness-based is slightly higher).
- Statistically, the highest-risk part of the field work experience is driving to and from the field.

However, injuries and deaths do happen almost every week to people <u>just like us</u> who are in the backcountry. These are often experienced, skilled people who just make a "dumb mistake."

- For example, the International Search and Rescue Database contains over 32,000 search and rescue incidents.
- U.S. national parks report an average of 9.2 injuries per 100,000 visits (muscle- skeletal [sprains and breaks], water-related, and falls are most common).
- Out of 63,700 geologists employed in the U.S., the Dept. of Labor reported 47 to 177 serious injuries per year over a 10-year period.

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

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

Most Common Reasons back country visitors are injured or killed:

- falls
- drowning
- heart attacks
- hypothermia/exposure
- heat stress
- lightning
- avalanche
- flash floods
- insects
- snakes, spiders
- predators

HAVING THE RIGHT MENTAL ATTITUDE

Print, Read, Learn (in Mapping Common area - copyright law allows you to make one copy for personal use)

A Dozen Ways to Die by Steve Howe *in* Backpacker, October 2006

Why Smart People Make Dumb Mistakes (And How You Can Avoid Them) by Laurence Gonzales in *National Geographic Adventure*, August 2007

Common Factors Leading to Injury Accidents

- Lack of experience
- Risk-taking attitude
- Over confidence (in some activities injury/death rates actually increase with skill – don't add to the statistics)
- Goofing off, carelessness
- High-risk activities (heights, steep slopes, speed)
- Weather changes (deteriorating weather)
- Working on or near water
- Working with or near mechanical equipment
- Fatigue (accident rates definitely do increase in the afternoon)

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

- Recognize that we are prone to make mistakes (often, the more experienced we become, the more prone we are to be casual, i.e. – careless)
- Stop – force yourself to think about safety
- Make a safety checklist – review it before each trip
- Watch for signs of a wandering mind
- Watch for signs that a situation is deteriorating (weather, my health, my attitude, terrain, etc.)
- Ask yourself these questions:
  1. What is my ultimate goal? Hint: It is NOT to complete the task. It IS to return home safely at the end of the day or project.
  2. What are the dangers I could face in this activity? How much am I willing to risk?
  3. What are the warning signs I might see that a situation is deteriorating? What is my plan for "bailing out" before things get bad?
  4. How bad does it get before I quit?

- from article in National Geographic Adventure by Laurence Gonzales, Aug. 2007

When something bad happens – S.T.O.P.

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

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

Observe - your surroundings, your own condition, your resources, your options

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

When something bad happens – who survives?

- People who believe in themselves
- People who have a strong will to live
- People who "use their head" (see S.T.O.P. above)
- People with survival skills
- People who are prepared (gear and training)

After an incident:

- fill out an incident report ASAP; *document*
- meet with your supervisor, etc.

SPECIFIC SITUATIONS, ALLERIGIES, ANIMALS, LIGHTNING, HEAT, COLD, AND MUCH MORE

This manual does not attempt to cover specific situations – there are far too many to cover here. Field workers should study information on the specific conditions, situations, dangers, and emergencies they might encounter in the field in the following excellent resources. Please study them thoroughly. Photocopies of some materials are free for the taking.

Information from Internet

Hypothermia and Other Cold-Related Injuries - Outdoor Action Guide Lightning - Updated Recommendations

Living with Wildlife in Lion Country Living with Wildlife in Bear Country

Bears – Brochures, Pepper spray questions/answers Snakes

Twenty-five Important-but-Often-Overlooked Outdoor Health Tips Driver Fatigue

Recommended Publications

Health and Safety Code Handbook – U.S. Dept of Agriculture, Forest Service Guide to Safe Field Operations – USGS OFR 95-777

Camping and Wilderness Survival – Paul Tawrell

Field Safety in Uncontrolled Environments – AAPG Desert Survival Handbook – Charles A. Lehman

Planning for Field Safety – American Geological Institute Kennecott Exploration Field Guide

Do not Get Bitten – Buck Tilton

Do not Get Eaten – Dave Smith

Do not Get Sick – Buck Tilton and Rick Bennett UGS Mapping Program Field Safety Notebook

(Miscellaneous info: newspaper clippings, company product information, internet chat- room discussions regarding products, real stories, etc.)

KENT STATE UNIVERSITY
FIELD RESEARCH SAFETY PLAN
GEOLOGY DEPARTMENT 330-672-2680

This template may be used by the Principal Investigator (PI), Project Manager, Professor, or Instructor to **assist** with the development of a Safety Plan for classes and research projects. **The completed Safety Plan should be shared with all the members of the field team.** Multiple trips to the same location can be covered by a single Safety Plan. The Safety Plan should be revised whenever a significant change to the location or scope of fieldwork occurs.

Emergency Contact: Name: _____ Phone: _____

Emergency Contact: Name: _____ Phone: _____

Section I.

Principal Investigator/Project Manager/Professor/Instructor:		Department:	
Phone:		Email:	
Project Duration:			

Location of Field Research

Country:		Geographical Site:	
State or County:		Nearest City:	
Nearest Hospital or Other Health Facility:		Phone Number:	

Attach map with driving directions from field site to nearest hospital or health care facility

KSU Contact Person:		Phone:	
Local (Field) Contact Person:		Phone:	

Field Work Personnel (Attach separate sheet of paper if necessary)

Name	Affiliation, Phone, Emergency contact #s and names	Category (check all that apply)			
		Leader	Team Member	Other (specify)	Trained First Aider
		☐	☐		☐
		☐	☐		☐
		☐	☐		☐
		☐	☐		☐
		☐	☐		☐

Section II.

Field Research Study/Project: Describe scope of fieldwork or activity. (Attach separate sheet of paper if necessary). Please include county names, county Sheriff numbers, and general GPS coordinates of boundary of the study area. If you plan to be out of this area, describe your plan to let people know.

Hazards Inherent to the Project (Check all that Apply)

Environment

- ☐ High Altitude
- ☐ Extreme Temperature
- ☐ Excessive/Extreme Exposure to sun, wind, blowing sand, etc.
- ☐ Work Over/Under Water
- ☐ Diving

Accessibility

- ☐ Remote Location
- ☐ Long Distance to Medical Services
- ☐ Difficult Communications with the outside world

Terrain

- ☐ Rough/Unusual Terrain
- ☐ Flash Flood Potential
- ☐ Falling Objects (avalanches, rock falls, etc.)
- ☐ Work along roadway shoulders (Attach traffic control plan and permit, if required
- ☐ Heights (trees, cliffs, etc.)
- ☐ Disaster Area
- ☐ Violence (political, military, etc.)

Flora/Fauna

- ☐ Wild Animal Hazards
- ☐ Insects as Known Disease Carriers
- ☐ Trapping/Handling Animals
- ☐ Toxic/Poisonous Plants

Work Tasks

- ☐ Work in Confined Space (natural or man-made)
- ☐ Trenching/Excavating
- ☐ Work at Night/Poor Lighting
- ☐ Noise Generated > 85 dBA
- ☐ Dusts/Other Particulate Hazards
- ☐ Potential for Oxygen Deficiency or Other Atmospheric Hazards (i.e. gas, vapor)
- ☐ Hazardous Waste Generation
- ☐ Transportation of Hazardous Materials
- ☐ Handling Hazardous Materials
- ☐ Storage of Hazardous Materials on site

Work Tasks ***continued***

- ☐ Lack of Potable Water
- ☐ Lack of Sanitary Facilities
- ☐ Flying Debris or Impact
- ☐ Electrical Hazard
- ☐ Fire Hazards (wildfires)
- ☐ Diving
- ☐ Climbing/Strenuous Hiking Required

Equipment Used in Field Area

- ☐ Snowmobile/ATV
- ☐ Boat/Canoe/Kayak
- ☐ Forklift

Materials Brought to Field Area

- ☐ Chemicals
- ☐ Biological
- ☐ Radiological
- ☐ Other
- ☐ No Known Hazards

Section III.

Safety Plan: Describe safety provisions or procedures for the hazard(s) identified in the field research activities. (Attach separate sheet of paper if necessary)

Personal Protective Equipment or Clothing Required: All field activities require basic protection including appropriate field clothing, hand protection, safety shoes/boots, and eye protection. Any additional PPE requirements based on the hazards identified ad part of minimizing risk of exposure, injury or illness. (Check all that apply)

- ☐ Face Shields
- ☐ Hearing Protection
- ☐ Hard Hat
- ☐ Rain Gear
- ☐ Respirator

Type: _____

Cartridge/Filter Type:

_____

- ☐ Portable Eye Wash
- ☐ Emergency Shower
- ☐ Fall Protection
- ☐ Extraction Equipment (Confined Space)
- ☐ Other

Travel Immunizations: List any required immunizations/prophylaxis required for this field study

Preparedness (Check all that Apply)

- ☐ Medications (Taken on a Regular Basis)
- ☐ Allergy Treatments (as needed)
- ☐ Adequate Food and Water Supplies
- ☐ Water Purification Tablets or Filter Devices
- ☐ Other _____

Safety Training Required	
☐ First Aid/CPR	☐ Biosafety
☐ Emergency Action and Preparedness	☐ Radiation Safety
☐ Project Specific Hazard Communication	☐ Laser Safety
☐ OSHA Carcinogens	☐ Respiratory Protections
☐ Compressed Gasses and Cryogenic Liquids	☐ Forklift/Other Heavy Equipment
☐ Hot Works	☐ Confined Space Entrant/Attendant/Supervisor
☐ Dangerous Good/Hazardous Materials Shipping	☐ Heat Illness Prevention
☐ Certified SCUBA Diver	☐ Other _____

Section IV.

Emergency Plan/Procedure: Describe emergency response procedures in an event of an injury, exposure, accident, or other emergency situation. Include emergency communication, evacuation plans, etc. (Attach separate sheet of paper if necessary.

ACKNOWLEDGMENT OF PARTICIPANT

By signing this statement, I acknowledge and certify that the following actions and communications were performed in a clear manner.

I was informed of the procedures, regulations, and sources of risk. I have had sufficient time to read the materials provided, and I was informed in a safety seminar by the instructor of the procedures, policies, and risks involved.

I was given opportunities to ask questions, both in private and in public, to clarify any of the information provided.

I provided a full and truthful statement of my health status, and I was provided opportunities to discuss any health issues with the instructor.

It was made clear that risk assessments and general planning have occurred for this class, but that no one can foresee all risks and situations in this class.

I am aware that IF AT ANY TIME, I violate these safety or field guidelines, and the instructor[s] deem my behavior to have contributed to an unsafe or inappropriate learning environment, the instructors have the right to rectify the situation. This might include a discussion with me and/or other students to correct the behavior, and/or it may lead to immediate removal from the course, in which case, participants are provided a ride to the nearest public transportation to return to Kent.

_____ _____

Signature of Student Date

_____

Signature of Instructor