



SAFETY IN THE FIELD

GIFT Expedition to Medicine Lake, CA

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The first priority for any fieldwork is personal safety. Safety is above the science goals. Fieldwork can be conducted safely if there is a culture of safety adopted by everyone. To achieve a safe culture, field team members need to abide by common policies.

- 1 COVID Safety Plan
- 2 Fieldwork Safety
- 3 Fieldwork Etiquette
- 4 Illness or Injury
- 5 Search and Rescue (how to be found)
- 6 Truck Safety
- 7 Emergency Numbers
- 8 Health Services
- 9 Acknowledgements

1 Covid Safety Plan

[Field leads updated the COVID-19 safety strategy repeatedly to reflect new knowledge and changing external circumstances. Key components included:

- Pre-trip preventative measures
- Commitment to adhere to FAA, CDC, TSA and DOT travel guidelines
- Commitment to adhere to local health and safety regulations
- Procedure for daily COVID self-assessments
- Procedure in case of a teammate developing COVID symptoms
- Procedure in case of close contact between a teammate and someone who has COVID]

2 Fieldwork Safety

1. Wear safety gear appropriate for the work. This always includes reflective vests and can include glasses, masks, lights, helmets, and gloves. Some situations REQUIRE safety gear. For instance: helmets are required when rocks are overhead, gloves are required when hiking over lava, lights are required when working in the dark, and protective eyewear is required when using a rock hammer. The field lead will make it clear what safety gear are required.
2. Each field group must always have a first aid kit with them. Before departing to the field, check that materials are not expired and are in good condition. First Aid kit materials are meant to be used! When they are used, keep a written log of their use and reason. Report this up the Chain of Command.

3. Each person needs 3 light sources to enter a cave. Headlamp, a backup flashlight, and something else (e.g., matches, candle, phone, etc.). Each group needs extra batteries for lights.
4. Work in groups of 2 or more. The easiest way to get lost is to be alone. Also, a relatively minor injury (e.g., sprained ankle) can become serious if no one knows where you are. NEVER ENTER A CAVE ALONE.
5. Always wear boots in the field. Tennis shoes, etc. are not recommended for fieldwork, as they do not provide adequate ankle support. Bring spare, breathable shoes to help your feet rest after a field day (for in camp or hotel).
6. Stay out of precipitous areas. If you have doubts DON'T DO IT! The success of the group depends on the safety of everyone.
 - a. When you have to climb steep slopes, be careful to avoid dislodging loose materials. A rolling rock can be extremely dangerous to the people below.
 - b. Avoid climbing directly above another person or group. If you must pass above them on a slope, always warn the people below of what you intend to do and wait until they get out of the way. If you dislodge a rock, yell, "ROCK!". If you are below, seek shelter.
 - c. Do not roll large boulders; there could be other people, out of sight down slope and a rapidly moving boulder can be fatal.
7. Do not drink water from streams in the field without filtering it first. Even apparently sparkling clear creek water might contain pathogenic organisms.
8. Be careful when crossing fences that you don't break them down (bad for the fence) or cut yourself on the barbed wire (bad for you). Also, ALWAYS leave gates as you found them. If they are open, leave them open. If they are closed, make sure they are closed after you pass through.
9. Always return to the trucks at the agreed upon time. If you get lost, walk only until dusk and stay together as a group. At dusk, find shelter, and stay put! Never try to walk out of the field at night. We have a detailed search and rescue policy (Section 5).
10. EVERY DAY when you leave for the field be certain you have: (1) raingear, (2) extra layers (3) food, (4) plenty of water. If you have to spend a night in the mountains, these materials are critical.
11. Electrical storms pose a hazard in the field. If you are in the field and see lightning within 30 seconds of hearing thunder, go back to the trucks. If you are above the tree line and hear thunder, you should move down to a lower elevation and into the forest quickly, and "hunker down."
12. If you are caught in a rainstorm and you are in the field, be aware of flash floods and be ready to move to higher ground if streams begin to rise.
13. Deviations from the field plan should be discussed at the morning briefing. If you are in the field and need to stay later than the plan, someone must communicate the

changes with the field lead. If they cannot be reached by radio or cellphone, send 2 team members (or one truck worth) to inform the field lead in person.

14. If operating on park land, the field lead will communicate with local rangers regularly.
15. Be communicative of how you feel in the field. Fatigue, dehydration, scrapes and bruises, and other maladies can go unnoticed and can lead to bigger injury.
16. We are operating in a high fire danger area.
 - a. If there are wildfire in the distance and wind sends smoke into our field area, the best way to protect against the potentially harmful effects of wildfire smoke is to reduce your exposure to wildfire smoke by, for example:
 - i. Seeking cleaner air indoors and cleaner air spaces.
 - ii. Wearing a KN95 mask
 1. A cloth mask would provide little protection from smoke
 - b. Be careful of parking or driving in tall, dry, vegetation, such as grass. The hot underside of the vehicle can start a fire.
 - c. Evaluate your instruments and their potential to spark and start fires
 - d. If electronics are known to cause sparks (e.g., connecting to exposed batteries), perform sparking actions away from vegetation.
 - e. If your equipment starts a fire, put it out by smothering it or by using a fire extinguisher
 - f. If a fire is out of control call 911 immediately
 - g. If you discover a fire, call 911 immediately
 - h. Do not light fires unless they are permitted and always in a pre-designated fire-pit or cooking area.
 - i. Designate a person to stay with the fire until it is extinguished fully. Follow fire safety regulations as posted on Forest signage.
 - j. Safely dispose of tobacco products.

3 Fieldwork Etiquette

1. Abide by the Code of Conduct at all times. NASA's anti-harassment policy applies for the duration of the trip.
2. Conduct yourself in a respectful manner at all times. Be kind to each other and the people we meet in the field. We are ambassadors for our science, institutions, and projects. Future access to these field sites for any or all members of the group depends on local relationships. DO NOT jeopardize future work by conducting yourself foolishly. Always remember that we are guests.

3. Treat the landscape, animals and plants with respect. Know what is in the permit, and what our limitations are. If sampling is necessary, abide by the permit and sample in a non-obvious way, away from trails. Follow Leave No Trace Principles; “Pack it in, pack it out.”
4. Stay on existing, official trails whenever possible and unless the team holds a permit for off-trail work. If you do leave the trail, rake tracks and ‘naturalize’ with sticks where appropriate to obscure them when accessing off-trail areas. This discourages tourists from following our tracks into restricted areas that we have access to.

4 Illness or Injury

Only the individuals involved can make a rational decision about their physical condition and whether or not they should seek medical help. Several courses of action are available:

Minor illnesses or injuries (colds, blisters, minor sprains, etc.)

You must decide whether to “tough it out” or to stay in camp / hotel for the day and recover. If you decide you can’t go in the field, and feel up to “office work”, discuss options with your group to come up with data processing jobs to be useful in camp.

Some injuries (e.g., twisted knees, sprained ankles, and the like) make it impossible for you to keep up with your team. In this case, a decision must be made about whether one- or two-days rest will get you back on your feet, whether you require medical attention, or whether you will be unable to continue with field work.

In general, treatment of minor injuries such as small cuts and blisters is the responsibility of the individual.

Regulating body temperature is important every day, in any weather. overheating or getting too cold can start out as minor problems but ignored can become serious.

Dehydration is a common malady in the field. Signs include:

- Headache, dry mouth, thirst, dark yellow pee (or not needing to go)
- Left to progress, and in the heat, dehydration can contribute heat exhaustion and heat stroke.

Heat exhaustion signs include those for dehydration plus:

- Muscle cramps, disorientation, weakness, fatigue, nausea, vomiting, and heightened pulse and respiratory rates.

Heat stroke signs include:

- High body temperature ($>104^{\circ}$ F), confusion, throbbing headache, alteration in sweating, loss of consciousness.
- Heat stroke is serious and requires immediate medical attention

Hypothermia occurs when the body temperature drops < 95° F. Early signs include:

- Shivering, clumsiness, apathy, confused and sluggish thinking, slurred speech, and "the umbles" (stumbles, mumbles, fumbles, grumbles)

Left to progress, hypothermia can become serious. Signs to seek emergency medical treatment include:

- Slow and shallow breathing, weak pulse, loss of consciousness,

Serious illness or injury

If you need medical attention, every effort will be made to get you to a doctor as quickly as possible. It should be kept in mind that in some cases the nearest doctor could be hours away and decisions to get medical help should not be postponed until it is clear that this trip is necessary. The preference is to err on the side of caution and safety, so if you have any reason to believe a trip to the doctor is needed, please do not hesitate to let your team lead and field lead know.

IN THE EVENT OF SERIOUS ILLNESS OR INJURY IN THE FIELD, THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED:

1. Check the scene for hazards to you
2. Check the victim

If the injured person can move under his/her own power

1. Use a radio or cell phone to report the injury up the chain of command. Contact your team lead who will contact the field lead.
2. The entire team is to leave the field along the easiest route available and return to the trucks.
3. Return to camp safely. DO NOT SPEED
 - a. If communication was not possible before, try from camp
4. The field lead will report the injury to the Local Authority.

If the injured person is immobile

Important: If there is a suspicion of a back or neck injury, DO NOT ATTEMPT TO MOVE THEM

1. Call 911 and follow the operator's instructions.
2. Designate another person to use a radio or cell phone to report the problem up the chain of command. Contact your team lead, who will contact the field lead.
3. Make the injured person as comfortable and warm as possible. At least one person should remain with the victim.

If emergency services are needed and 911 cannot be reached in the field

4. Use a radio or cell phone to report the problem up the chain of command. Contact your team lead who will contact the field lead. Be clear about your location and how to find you.
5. Make the injured person as comfortable and warm as possible. At least one person should remain with the victim.
6. Part of the group will return to camp safely (Again: DO NOT SPEED. If you don't make it to camp you are no help to anyone).
7. Be sure you know exactly how to return to the injured person.
 - a. If communication to 911 was not possible before, try from camp.
8. The field lead will report the injury to the Local Authority.

5 Search and Rescue (How to be Found)

1. People missing from camp an hour after the agreed upon time (see field plan) will be considered lost, activating a search.
2. Deviations from the field plan should be discussed at the morning briefing. If you are in the field and need to stay later than planned, someone must communicate the changes with the field lead. If they cannot be reached by radio or cellphone, send 2 team members (or one truck worth of people) back to camp to report the new plan.
3. If you are not lost but separated from your team, return to your vehicles or initial field ingress location.
4. If you become lost: stay calm.
 - a. Find a safe place where you can stay dry, near a trail, stream, fence, or road if one is nearby (searches start using geographic features).
 - b. Stay together with your partner / team.
 - c. Use something reflective or brightly colored to place a signal on a high point close to you that might be visible from far away.
 - d. Continue to try to communicate (radio, whistle, shouts).
 - e. Know that help is coming.

6 Operating Trucks

In general, the person listed on the rental will drive the field trucks. The driver is responsible for the safety of the passengers and the gear in it. For this reason, special efforts will be required to maintain safe driving habits. Reckless or inept driving cannot be tolerated and anyone exhibiting this behavior will be replaced immediately. In addition, passengers must not engage in any behavior that will unnecessarily distract the driver.

1. At all times trucks are to be driven at reasonable speeds as dictated by time of day, road regulations, weather, and road and traffic conditions, etc.
2. Consumption of alcoholic beverages within the vehicles, whether in motion or parked, is not allowed. It is each individual's responsibility to follow all local laws.

3. No one is permitted to operate a truck while intoxicated.
4. Trucks are to be kept neat and in good repair. (Throw out trash at each opportunity.) Report all mechanical problems immediately to the field lead and treat the vehicles with respect.
5. Collect all toll receipts, gas receipts, etc. for your own reimbursement.
6. The person to the right of the driver (co-pilot) is to stay awake and alert at all times. This person is the assistant driver and should handle radio communications, map reading, tolls, etc., for the driver.
7. No driver is permitted to drive to the point of fatigue.
8. When traveling, all drivers and co-pilots are to know where the next rendezvous point is, to minimize the need for following each other in a tight convoy. If you want to report a problem, use the radio. If it is inoperative, flash your headlights.
9. It is the driver's responsibility to check oil, water, tires, etc. at each gas stop. Report mechanical issues or suspicions to the field lead ASAP.
10. ALWAYS be sure you are filling the truck with the proper fuel: diesel or gas.

7 Emergency Numbers

[Phone number for field lead]

[Phone numbers of key local contacts]

[Local emergency services phone number]

[Phone number of logistics lead/another contact person for the team]

8 Health Service and Hospitals

[Contact information removed. Key components of this section are:

- Closest minimal health service by road
- Closest 24-hr hospital
- Other walk-in clinic(s) and 24-hr hospital(s)]

9 Acknowledgements

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Be safe and do good work.